

Exhibit 24

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

B.P.J. by her next friend and mother, HEATHER JACKSON,

Plaintiff,

v.

WEST VIRGINIA STATE BOARD OF EDUCATION, HARRISON COUNTY BOARD OF EDUCATION, WEST VIRGINIA SECONDARY SCHOOL ACTIVITIES COMMISSION, W. CLAYTON BURCH in his official capacity as State Superintendent, DORA STUTLER in her official capacity as Harrison County Superintendent, and THE STATE OF WEST VIRGINIA,

Defendants,

and

LAINY ARMISTEAD,

Defendant-Intervenor.

Civil Action No. 2:21-cv-00316

Hon. Joseph R. Goodwin

**EXPERT REPORT AND DECLARATION OF
JOSHUA D. SAFER, MD, FACP, FACE**

1. I have been retained by counsel for Plaintiffs as an expert in connection with the above-captioned litigation.

2. The purpose of this expert report and declaration is to offer my expert opinion on: (1) relevant medical and scientific background regarding gender identity and the attempted regulation of transgender women playing women's sports, including the Endocrine Society's Guidelines for providing gender-affirming care to transgender people; (2) the policies of athletic organizations regarding the participation of transgender women in women's sports, the difficulties that have arisen when athletic associations have attempted to define a person's sex,

and the relationship of these policies to the scholastic context; and (3) whether there is any medical justification for West Virginia's exclusion of transgender women and girls from school sports, including whether the available scientific evidence supports West Virginia's assertion that "classification of athletic teams according to" an "individual's reproductive biology and genetics at birth sex" "is necessary to promote equal athletic opportunities for the female sex."

3. I have knowledge of the matters stated in this expert report and declaration and have collected and cite to relevant literature concerning the issues that arise in this litigation in the body of this declaration and in the attached bibliography.

4. In preparing this expert report and declaration, I relied on my scientific education and training, my research experience, and my knowledge of the scientific literature in the pertinent fields. The materials I have relied upon in preparing this declaration are the same types of materials that experts in my field of study regularly rely upon when forming opinions on the subject. I may wish to supplement these opinions or the bases for them as a result of new scientific research or publications or in response to statements and issues that may arise in my area of expertise.

PROFESSIONAL BACKGROUND

5. I am a Staff Physician in the Endocrinology Division of the Department of Medicine at the Mount Sinai Hospital and Mount Sinai Beth Israel Medical Center in New York, NY. I serve as Executive Director of the Center for Transgender Medicine and Surgery at Mount Sinai. I also hold an academic appointment as Professor of Medicine in Mount Sinai's Icahn School of Medicine. A true and correct copy of my CV is attached hereto as Exhibit A.

6. I have been Board Certified in Endocrinology, Diabetes and Metabolism by the American Board of Internal Medicine since 1997.

7. I graduated from the University of Wisconsin in Madison with a Bachelor of Science degree in 1986. I earned my Doctor of Medicine degree from the University of Wisconsin in 1990. I completed intern and resident training at Mount Sinai School of Medicine, Beth Israel Medical Center in New York, New York from 1990 to 1993. From 1993 to 1994, I was a Clinical Fellow in Endocrinology at Harvard Medical School and Beth Israel Deaconess Medical Center in Boston, Massachusetts. I stayed at the same institution, serving as a Clinical and Research Fellow in Endocrinology under Fredric Wondisford, from 1994 to 1996.

8. Since 1997, I have evaluated and treated patients along with conducting research in endocrinology. Since 2004, my patient care and research has been focused on the medicine/science specific to transgender people. I have led several other programs either in transgender medicine or in general endocrinology. In particular, I served as the Medical Director of the Center for Transgender Medicine and Surgery, Boston Medical Center, Boston, MA (2016-2018); as the Director of Medical Education, Endocrinology Section, Boston University School of Medicine, Boston, MA (2007-2018); as the Program Director for Endocrinology Fellowship Training, Boston University Medical Center, Boston, MA (2007-2018); and as Director of the Thyroid Clinic, Boston Medical Center, Boston, MA (1999-2003).

9. I have authored or coauthored over 100 peer-reviewed papers including many critical reviews; textbook chapters; and case reports in endocrinology and transgender medicine.

10. Among my publications are the latest review of transgender medicine in the *New England Journal of Medicine* and the latest review of transgender medicine in the *Annals of Internal Medicine*. See Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451-2460; Safer JD, Tangpricha V. Care of the transgender patient. *Ann Intern Med* 2019; 171:ITC1-ITC16. I am also a co-author of the sections of UpToDate that relate to gender-

affirming hormone treatment for transgender people. UpToDate is an evidence-based, physician authored, on-line medical guide and is currently the most widely used such guide among medical providers.

11. I was the inaugural President of the United States Professional Association for Transgender Health (“USPATH”). I have served in several other leadership roles in professional societies related to endocrinology and transgender health. These societies include the Alliance of Academic Internal Medicine, the American College of Physicians Council of Subspecialty Societies, the American Board of Internal Medicine, the Association of Program Directors in Endocrinology and Metabolism, and the American Thyroid Association.

12. Since 2014, I have held various roles as a member of the World Professional Association for Transgender Health (“WPATH”), the leading international organization focused on transgender health care. WPATH has approximately 2,000 members throughout the world and is comprised of physicians, psychiatrists, psychologists, social workers, surgeons, and other health professionals who specialize in health care for transgender people. From 2016 to the present, I have served on the Writing Committee for Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People.

13. I have served in various roles as a member of the Endocrine Society since 2014. I served on a nine-expert Task Force to develop the Endocrine Treatment of Transgender Persons Clinical Practice Guideline from 2014 to 2017. The experts on the Task Force which included me, a methodologist, and a medical writer co-authored the “Endocrine Treatment of Gender-Dysphoria/Gender Incongruent Persons: An Endocrine Society Clinical Practice Guideline,” (“Endocrine Society Guidelines”), available at <https://academic.oup.com/jcem/article/102/11/3869/4157558>.

14. I have served as a Transgender Medicine Guidelines Drafting Group Member for the International Olympic Committee (“IOC”) since 2017.

15. Since 2019, I have also served as a drafting group member of the transgender medical guidelines of World Athletics, formerly known as the International Amateur Athletic Federation (“IAAF”).

16. I have not previously testified as an expert witness in either deposition or at trial. I am being compensated at an hourly rate of \$250 per hour for preparation of expert declarations and reports, and \$400 per hour for time spent preparing for or giving deposition or trial testimony. My compensation does not depend on the outcome of this litigation, the opinions I express, or the testimony I provide.

RELEVANT MEDICAL AND SCIENTIFIC BACKGROUND

17. “Gender identity” is the medical term for a person’s internal, innate sense of belonging to a particular sex. *See* Endocrine Society Guidelines, Tbl.1 *and* Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451–2460, Tbl.1.

18. Although the detailed mechanisms are unknown, there is a medical consensus that there is a significant biologic component underlying gender identity. Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451-2460; Safer JD, Tangpricha V. Care of the transgender patient. *Ann Intern Med* 2019; 171:ITC1-ITC16. A person’s gender identity is durable and cannot be changed by medical intervention.

19. The terms “gender identity,” “gender roles,” and “gender expression” refer to different things.

20. Gender roles are behaviors, attitudes, and personality traits that a society (in a given culture and historical period) designates as masculine or feminine and/or that society

associates with or considers typical of the social role of men or women. *See* Endocrine Society Guidelines Tbl.1. The convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are examples of socially constructed gender roles from a particular culture and historical period.

21. By contrast, “gender identity” does not refer to a set of socially contingent behaviors, attitudes, or personality traits that a society designates as masculine or feminine. It is an internal and largely biological phenomenon.

22. Gender expression is how a person communicates gender identity both internally and to others. *See* Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451–2460, Tbl.1. For example, a person with a female gender identity might express her identity through typically feminine outward expressions of gender roles like wearing longer hair or more typically feminine clothing.

23. The phrase “biological sex” is an imprecise term that can cause confusion. A person’s sex encompasses the sum of several different biological attributes, including sex chromosomes, certain genes, gonads, sex hormone levels, internal and external genitalia, other secondary sex characteristics, and gender identity. Those attributes are not always aligned in the same direction. *See* Endocrine Society Guidelines; Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451–2460.

24. Before puberty, boys and girls typically have the same levels of circulating testosterone. After puberty, the typical range of circulating testosterone for non-transgender women is similar to before puberty (<1.7 nmol/L), and the typical range of circulating testosterone for non-transgender men is 9.4-35 nmol/L. *See* Endocrine Society Guidelines (p 3888) *and* Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019.

25. Before puberty, age-grade competitive sports records show minimal or no differences in athletic performance between non-transgender boys and non-transgender girls before puberty. But after puberty, non-transgender boys and men as a group have better average performance outcomes in most athletic competitions when compared to non-transgender girls and women as a group. Based on current research comparing non-transgender boys and men with non-transgender girls and women before, during, and after puberty, the primary known biological driver of these average group differences is testosterone starting at puberty, and not reproductive biology or genetics. *See Handelsman DJ, et al. Circulating testosterone as the hormonal basis of sex differences in athletic performance. Endocrine Reviews 2018; 39:803–829, (p 820) (summarizing evidence rejecting hypothesis that physiological characteristics are driven by Y chromosome).*

26. Although there are ranges of testosterone that are considered typical for non-transgender men and women, many non-transgender women have testosterone levels outside the typical range.

a. Approximately 6% to 10% of women have a condition called polycystic ovary syndrome (PCOS), which can raise women’s testosterone levels up to 4.8 nmol/L.

b. Some elite female athletes have “46,XY DSDs,” a group of conditions where individuals have XY chromosomes but are born with typically female external genitalia and assigned a female sex at birth. Among individuals with 46,XY DSD some may have inactive testosterone receptors (a syndrome called “complete androgen insensitivity syndrome, CAIS”) which means they don’t respond to testosterone despite very high levels. Usually, these individuals have female gender identity and have external genitalia

that are typically female. They do not develop the physical characteristics associated with typical male puberty.

c. Other individuals with 46,XY DSD may have responsive testosterone receptors. These individuals may have female gender identity but at puberty they may start to develop higher levels of testosterone along with secondary sex characteristics that are typically masculine.

WORLD ATHLETICS POLICIES FOR WOMEN WITH HYPERANDROGENISM AND WOMEN WHO ARE TRANSGENDER

27. World Athletics is the international governing body for the sport of track-and-field athletics. Beginning in 2011, World Athletics (then known as IAAF) began requiring that women with elevated levels of circulating testosterone lower their levels of testosterone below a threshold amount in order to compete in elite international women's sports competitions. Under the 2011 regulations, women with hyperandrogenemia (defined as serum testosterone levels above the normal range) were allowed to compete only if they demonstrated that they had testosterone levels below 10 nmol/L or that they had CAIS, preventing their bodies from responding to testosterone.¹

28. In 2018 the IAAF issued revised regulations lowering the maximum testosterone threshold to 5 nmol/L.² The revised regulations were upheld by the Court of Arbitration for Sport ("CAS") in 2019.

¹ A copy of the 2011 regulation is available at [https://www.bmj.com/sites/default/files/response_attachments/2014/06/IAAF%20Regulations%20\(Final\)-AMG-30.04.2011.pdf](https://www.bmj.com/sites/default/files/response_attachments/2014/06/IAAF%20Regulations%20(Final)-AMG-30.04.2011.pdf)

² A copy of the 2018 regulations is available at <https://www.iaaf.org/download/download?filename=fd2923ad-992f-4e43-9a70-78789d390113.pdf&urlslug=IAAF%20Eligibility%20Regulations%20for%20the%20Female%20Classification%20%5BAthletes%20with%20Differences%20of%20Sex%20Development%5D%20in%20force%20as%20from%208%20May%202019>

29. In 2019, the IAAF adopted regulations allowing women who are transgender to participate in elite international women's sports competitions if their total testosterone level in serum is beneath a particular threshold for at least one year before competition. The IAAF set the threshold at 5 nmol/L, which was the same threshold set by the IAAF's 2018 regulations for non-transgender women with hyperandrogenism that had been upheld by the CAS when contested.³

30. The IAAF rules are consistent with the Endocrine Society Guidelines for the treatment of women who are transgender, which recommend that hormone therapy target circulating testosterone levels to a typical female range at or below 1.7 nmol/L (Endocrine Society Guidelines, p. 3887) and with the study of testosterone levels achieved in practice by medically treated women who are transgender (Liang JJ, et al. Testosterone levels achieved by medically treated transgender women in a United States endocrinology clinic cohort. *Endocrine Practice* 2018; 24:135-142).

INTERNATIONAL OLYMPIC COMMITTEE POLICIES FOR WOMEN WHO ARE TRANSGENDER

31. Formal eligibility rules for the participation of transgender women in the Olympics were published in 2003. The 2003 rules required that transgender women athletes could compete in women's events only if they had genital surgery, a gonadectomy (*i.e.*, removal of the testes), and legal documentation of female sex.⁴

³ A copy of the 2019 regulations is available at <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewi8qbO nsNL0AhUBkIkEHWdpAiQQFnoECAUQAQ&url=https%3A%2F%2Fwww.worldathletics.org%2Fdownload%2Fdownload%3Ffilename%3Dace036ec-a21f-4a4a-9646-fb3c40fe80be.pdf%26urlslug%3DC3.5%2520-%2520Eligibility%2520Regulations%2520Transgender%2520Athletes&usg=AOvVaw1aPuD3gUoz5hcGKgmumVb5>

⁴ A copy of the 2003 policy is available at <https://olympics.com/ioc/news/ioc-approves-consensus-with-regard-to-athletes-who-have-changed-sex-1>

32. However, many women who are transgender are treated with medicines alone and don't have gonadectomy. As well, many jurisdictions do not have systems to document the sex of transgender people. In some jurisdictions, being transgender is illegal, and disclosure that someone is transgender can be unsafe.

33. Therefore, in 2015, the IOC adopted new guidance modeled after the IAAF's 2011 regulations for non-transgender women with hyperandrogenism. Under the 2015 IOC guidance, women who are transgender were required to demonstrate that their total testosterone level in serum was below 10 nmol/L for at least one year prior to competition. The 10 nmol/L threshold was the same threshold set by the IAAF's 2011 regulations.⁵

34. In 2021, the IOC adopted a new "Framework on Fairness, Inclusion, and Non-Discrimination on the Basis of Gender Identity and Sex Variations" (the "2021 framework"), which replaces the 2015 guidance.⁶

35. Unlike the IOC's 2003 and 2015 policies, the IOC's 2021 framework does not attempt to adopt a single set of eligibility standards for the participation of transgender athletes that would apply universally to every IOC sport. Instead, the 2021 framework provides a set of governing principles for sporting bodies to follow when adopting eligibility rules for their particular sport.

36. Under the 2021 framework, "[n]o athlete should be precluded from competing or excluded from competition on the .exclusive ground of an unverified, alleged or perceived unfair

⁵ A copy of the 2015 policy is available at https://stillmed.olympic.org/Documents/Commissions_PDFfiles/Medical_commission/2015-11_ioc_consensus_meeting_on_sex_reassignment_and_hyperandrogenism-en.pdf

⁶ A copy of the 2021 framework is available at https://stillmed.olympics.com/media/Documents/News/2021/11/IOC-Framework-Fairness-Inclusion-Non-discrimination-2021.pdf?_ga=2.207516307.1210589288.1636993769-1638189514.1636993769

competitive advantage due to their sex variations, physical appearance and/or transgender status.” Principle 5.1. “Until evidence . . . determines otherwise, athletes should not be deemed to have an unfair or disproportionate competitive advantage due to their sex variations, physical appearance and/or transgender status.” Principles 5.2.

37. The 2021 framework further provides that “[a]ny restrictions arising from eligibility criteria should be based on robust and peer reviewed research that: (a) demonstrates a consistent, unfair, disproportionate competitive advantage in performance and/or an unpreventable risk to the physical safety of other athletes; (b) is largely based on data collected from a demographic group that is consistent in gender and athletic engagement with the group that the eligibility criteria aim to regulate; and (c) demonstrates that such disproportionate competitive advantage and/or unpreventable risk exists for the specific sport, discipline and event that the eligibility criteria aim to regulate.” Principle 6.1

NCAA POLICIES FOR WOMEN WHO ARE TRANSGENDER

38. Since 2011, the National College Athletics Association (“NCAA”) has allowed women who are transgender to participate on the same teams as other women after one year of testosterone suppression. Under the NCAA policy transgender student-athletes certified that they have been on hormone therapy for a period of one year. The NCAA policy did not require ongoing testosterone testing.

39. The NCAA recently announced that it has revised its policy to adopt a “sport-by-sport approach” that “aligns transgender student-athlete participation for college sports with recent policy changes.” *See* NCAA Media Center: Board of Governors updates transgender participation policy (Jan. 19, 2022), at <https://www.ncaa.org/news/2022/1/19/media-center-board-of-governors-updates-transgender-participation-policy.aspx>. “Like the Olympics, the

updated NCAA policy calls for transgender participation for each sport to be determined by the policy for the national governing body of that sport, subject to ongoing review and recommendation by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports to the Board of Governors.” *Id.* The new NCAA policy contemplates that for certain sports, the national governing body for the sport may require transgender athletes “to document sport-specific testosterone levels.” *Id.*

**PARTICIPATION OF GIRLS AND WOMEN WHO ARE TRANSGENDER
IN THE SCHOLASTIC CONTEXT**

40. The policies developed by World Athletics and the IOC for transgender athletes were based on the particular context of elite international competition. Not all of the same considerations apply in scholastic contexts.

41. The World Athletics and prior IOC policies were more stringent than the prior NCAA policy because those organizations were concerned with creating policies that cannot be manipulated by governments that are not bound by the rule of law. For example, there have been many well-known examples of state-sponsored doping scandals. The Russian Olympic team is currently banned from international competition due to an organized doping effort. Also, there have been cases where governments have issued fraudulent birth certificates and identification documents. In 2000, Yang Yun was a medal winner in Gymnastics from the Chinese team. She later reported that she was 14-years-old at the time in violation of the rule that all athletes for her events had to be at least 16-years-old. In 2008, He Kexin was 14-years-old when participating in Gymnastics for the Chinese team in violation of the same rule that athletes be at least 16-years-old in those events. A new passport for Ms. He had hastily appeared 6 months prior to the Olympic Games that year with a new birth year so that Ms. He could qualify.

42. To confront the significant problem of state-sponsored cheating, World Athletics and the IOC have to develop eligibility criteria for transgender athletes that can be independently verified to prevent manipulation by non-transgender athletes, and that do not depend on the gender marker listed on identification documentation issued by an athlete's home country. Those concerns do not apply to scholastic athletic competitions in the United States. Scholastic athletic associations can rely on school records to show that an athlete is a girl who is transgender and has socially transitioned to live consistently with her gender identity as a girl.

43. The eligibility criteria for World Athletics and the IOC were also created as part of a system in which elite athletes in international competitions are already regulated and monitored in some circumstances like for doping. Within that context, testing female athletes' levels of testosterone is somewhat analogous to the types of restrictions and invasion of privacy that already exist. By contrast, in athletic competitions that are not as heavily regulated and monitored, it is hard to justify singling out girls who are transgender, girls with 46,XY DSDs, or girls who may just appear more typically masculine for special testosterone requirements that impose a significant additional burden.

44. The concerns that animated the World Athletics and prior IOC policies are even more attenuated for students in middle school and high school, where athletes' ages typically range from 11-18, with different athletes in different stages of pubertal development. Increased testosterone begins to affect athletic performance at the beginning of puberty, but those effects continue to increase each year of puberty until about age 18, with the full impact of puberty resulting from the cumulative effect of each year. As a result, a 14, 15, or 16-year old has experienced less cumulative impact from testosterone than a 17 or 18-year old.

45. Finally, unlike elite international competitions, schools and colleges often provide athletic competition as part of a broader educational mission. In that context, when scholastic athletics are a component of the educational process, institutions may adopt policies designed to emphasize inclusion and to provide the most athletic opportunities to the greatest number of people.

WEST VIRGINIA'S HB 3293

46. There is no medical justification for West Virginia's categorical exclusion of girls who are transgender from participating in scholastic athletics on the same teams as other girls.

47. HB 3293 states that "[c]lassification of teams according to biological sex is necessary to promote equal athletic opportunities for the female sex." The law defines "biological sex" as "an individual's physical form as a male or female based solely on the individual's reproductive biology and genetics at birth."

48. West Virginia's definition of "biological sex" does not reflect any medical understanding of that ambiguous term. As noted above, a person's sex encompasses the sum of several different biological attributes, including sex chromosomes, certain genes, gonads, sex hormone levels, internal and external genitalia, other secondary sex characteristics, and gender identity. Those attributes are not always aligned in the same direction. *See* Endocrine Society Guidelines; Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451-2460. For example, if West Virginia defines "biological sex" solely based on "reproductive biology and genetics at birth" it is not clear how West Virginia would define the "biological sex" of children with "46,XY DSDs," who have XY chromosomes but typically female external reproductive anatomy.

49. Even as applied to people without intersex characteristics or 46,XY DSDs, the statutory definition of “biological sex” is inconsistent with West Virginia’s stated goal of “promot[ing] equal athletic opportunities for the female sex.” By excluding girls who are transgender based on “biological sex,” and defining that term to mean “reproductive biology and genetics at birth,” West Virginia categorically prevents girls who are transgender from participating on girls’ teams regardless of whether they are pre-pubertal, receiving puberty blockers, or receiving gender-affirming hormone therapy. But based on current research, the primary known biological cause of average differences in athletic performance between non-transgender men as a group and non-transgender women as a group is circulating testosterone—not “reproductive biology and genetics at birth.” A person’s genetic makeup and internal and external reproductive anatomy are not useful indicators of athletic performance and have not been used in elite competition for decades.

50. With respect to average athletic performance, girls and women who are transgender and who do not go through endogenous puberty are somewhat similarly situated to women with XY chromosomes who have complete androgen insensitivity syndrome. It has long been recognized that women with CAIS have no athletic advantage simply by virtue of having XY chromosomes. *See also* Handelsman DJ, *et al.* Circulating testosterone as the hormonal basis of sex differences in athletic performance. *Endocrine Reviews* 2018; 39:803–29, p .820 (summarizing evidence rejecting hypothesis that physiological characteristics are driven by Y chromosome).

51. HB 3293 is also dramatically out of step with even the most stringent policies of elite international athletic competitions for girls and women who are transgender and who have gone through endogenous puberty. Unlike the policies of the IOC, World Athletics, or the

NCAA, HB 3293 excludes girls and women who are transgender from participating on girls' and women's sports teams even if they have suppressed their circulating levels of testosterone through gender-affirming hormone therapy.

52. Some critics of the prior IOC guidelines and World Athletics and NCAA policies have speculated that lowering the level of circulating testosterone does not fully mitigate the athletic advantage derived from endogenous puberty. But there is no basis to assert with any degree of confidence that this hypothesis is true. Based on the limited data available, it is equally or more plausible to hypothesize that women who are transgender could be at a net *disadvantage* in particular sports after receiving gender affirming hormone therapy, as compared to non-transgender women.

53. For example, transgender women who go through typically male puberty will tend to have larger bones than non-transgender women, even after receiving gender-affirming hormone therapy. But larger bones may be a disadvantage for transgender women who have typically female levels of circulating testosterone. Muscle mass will be decreased with the shift to female levels of circulating testosterone. Having larger bones without corresponding levels of testosterone and muscle mass would mean that a runner has a bigger body to propel with less power to propel it.

54. Similarly, in a sport where athletes compete in different weight classes (*e.g.* weight lifting), the fact that a transgender woman has bigger bones may be a disadvantage because her ratio of muscle-to-bone will be much lower than the ratio for other women in her weight class who have smaller bones.

55. There are only two studies examining the effects of gender-affirming hormone therapy on the athletic performance of transgender female athletes. The first is a small study of

eight long-distance runners who are transgender women. The study showed that after undergoing gender-affirming medical intervention, which included lowering their testosterone levels, the athletes' performance was reduced so that their performance when compared to non-transgender women was proportionally the same as their performance had been before treatment relative to non-transgender men. *See Harper J. Race times for transgender athletes. Journal of Sporting Cultures and Identities 2015; 6:1–9.*

56. A more recent study retrospectively reviewed the military fitness test results of 46 transgender women in the U.S. Air Force before and after receiving gender-affirming hormone therapy. These authors found that any advantage transgender women had over non-transgender women in performing push-ups and sit-ups was negated after 2 years. The study also found that before beginning gender affirming hormone therapy, transgender women completed the 1.5 mile run 21% faster on average than non-transgender women; and after 2 years of gender-affirming hormone therapy, transgender women completed the 1.5 mile run 12% faster on average than non-transgender women. *See Roberts TA, Smalley J, Ahrendt D. Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organisations and legislators. Br J Sports Med. 2020.*

57. Neither of these limited studies proves there are meaningful athletic advantages for transgender women after receiving gender-affirming hormone therapy, which could only be shown by longitudinal transgender athlete case-comparison studies that control for variations in hormonal exposure and involve numerous indices of performance. Moreover, the ability to perform push-ups and sit-ups or to run 1.5 miles does not necessarily translate into an athletic advantage in any particular athletic event. Because different sports require different types of physical performance, the studies suggest that the existence and extent of a performance

advantage may vary from sport to sport and should not be subject to a categorical across-the-board rule.

58. Even if evidence were eventually to show that on average transgender women have some level of advantage compared to average non-transgender women, those findings would have to be placed in context of all the other intra-sex genetic variations among athletes that can enhance athletic performance among different women or different men.

59. For example, in the academic literature, there are gene sequence variations that can be associated with athleticism referred to as “performance enhancing polymorphisms” or “PEPs.” A PEP is a variation in the DNA sequence that is associated with improved athletic performance. For example, variations in mitochondrial DNA have been associated with greater endurance capacity and greater mitochondrial density in muscles. Other PEPs are associated with blood flow or muscle structure. *See* Ostrander EA, et al. Genetics of athletic performance. *Annu Rev Genomics Hum Genet* 2009; 10:407–429.

60. As the IOC’s 2021 framework recognizes, there is no inherent reason why transgender women’s physiological characteristics related to athletic performance should be treated as any more of an “unfair” advantage than the advantages that already exist among different women athletes. The 2021 framework instructs that, even at the most elite level of competition, sporting organizations should base eligibility restrictions on whether there exists “a consistent, unfair, and disproportionate competitive advantage” when viewed within the broader context of all the other intra-sex variations that may give a comparative athletic advantage to a particular athlete.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

A handwritten signature in black ink, appearing to read "J. Safer", is written over a large, faint, oval-shaped watermark or background mark.

Executed on January 21, 2022

Joshua D. Safer, MD, FACP, FACE

BIBLIOGRAPHY

Handelsman DJ, et al. Circulating testosterone as the hormonal basis of sex differences in athletic performance. *Endocrine Reviews* 2018; 39:803–829.

Harper J. Race times for transgender athletes. *Journal of Sporting Cultures and Identities* 2015; 6:1–9.

Hembree WC, et al. Endocrine treatment of gender-dysphoria/gender incongruent persons: An Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab* 2017; 102: 3869–3903.

Ostrander EA, et al. Genetics of athletic performance. *Annu Rev Genomics Hum Genet* 2009; 10:407–429.

Roberts TA, et al. Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organisations and legislators. *Br J Sports Med*. 2020; 0:1–7. doi:10.1136/bjsports-2020-102329

Rogol AD, Pieper LP. The interconnected histories of endocrinology and eligibility in women’s sports. *Horm Res Paediatr* 2018; 90:213–220.

Safer JD, Tangpricha V. Care of the transgender patient. *Ann Intern Med* 2019; 171:ITC1-ITC16.

Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451-2460.

EXHIBIT A

CURRICULUM VITAE

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January 6, 2022

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Academic Training

1990 MD University of Wisconsin School of Medicine, Madison, WI
1986 BS University of Wisconsin, Madison, WI, Economics

Postdoctoral Training

1994 - 1996 Clinical and Research Fellow, Endocrinology, under Fredric Wondisford, Harvard Medical School - Beth Israel Deaconess Medical Center, Boston, MA
1993 - 1994 Clinical Fellow, Endocrinology, Harvard Medical School and Beth Israel Deaconess Medical Center, Boston, MA
1990 - 1993 Intern and Resident, Department of Medicine, The Mount Sinai School of Medicine, Beth Israel Medical Center, New York City, NY

Academic Appointments

2019 - present Professor of Medicine, Icahn School of Medicine at Mount Sinai, New York, NY
2006 - 2018 Associate Professor of Medicine and Molecular Medicine, Boston University School of Medicine
1999 - 2005 Assistant Professor of Medicine, Boston University School of Medicine
1996 - 1999 Instructor in Medicine, Harvard Medical School
1993 - 1996 Fellow in Medicine, Harvard Medical School

Hospital Appointments

2018 - present Staff Physician, The Mount Sinai Hospital, New York City, NY
2018 - present Staff Physician, Mount Sinai Beth Israel Medical Center, New York City, NY
1999 - 2018 Staff Physician, Boston University Medical Center, Boston, MA
2001 - 2006 Staff Physician, Veterans Administration Boston Health Care, Boston, MA
1996 - 1999 Staff Physician, Beth Israel Deaconess Medical Center, Boston, MA
1990 - 1993 House Staff, Beth Israel Medical Center, New York City, NY

Other Medical Staff Appointments

2004 - 2013 Staff Physician, Massachusetts Institute of Technology Medical, Cambridge, MA
1994 - 1999 Physician, Harvard Vanguard Medical Associates, Boston, MA
1987 - 1996 Captain, United States Army Reserve, Medical Corps

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Honors:

2019	Fellow, American College of Endocrinology
2019	Preaw Hanseree Memorial Lecture, University of Wisconsin-Madison
2017	Lesbian, Gay, Bisexual and Transgender Health Award, Massachusetts Medical Society
2012	Outstanding Service Award, Association of Program Directors in Endocrinology and Metabolism
2007	Fellow, American College of Physicians
2004	Boston University School of Medicine Outstanding Student Mentor Award
2001	Abbott Thyroid Research Advisory Council Award
1996	Knoll Thyroid Research Clinical Fellowship Award, Endocrine Society
1995	Trainee Investigator Award for Excellence in Scientific Research, American Federation for Clinical Research (AFCR)
1994	Trainee Investigator Award for Excellence in Scientific Research, AFCR
1990	The University of Wisconsin Medical Alumni Association Award
1988-1990	Senior Class President, University of Wisconsin, School of Medicine

Licensure and Certification

1997	Board Certification in Endocrinology, Diabetes and Metabolism, American Board of Internal Medicine, recertified 2007, 2017
1994	Board Certification in Internal Medicine, American Board of Internal Medicine, recertified 2007
1993	Massachusetts License Registration #77459, inactive
1990	New York License Registration #187263-1

Departmental and University Committees

Icahn School of Medicine at Mount Sinai

2020-present	Mount Sinai Disparities and Equity Research Taskforce Steering Committee
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Boston Medical Center

2016-2018	Physician Satisfaction Task Force, Department of Medicine
2016-2018	Transgender Patient Task Force
2006-2017	Pharmacy and Therapeutics Committee, Health Net Plan

Boston University School of Medicine

2009-2018	Admissions Committee
2005	Review Committee, Department of Medicine Pilot Project Grants
2000	Residency and Fellowship Core Curriculum Committee,
2000-2018	Internship Selection Committee, Residency Program in Medicine

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Boston University Goldman School of Dental Medicine

2003-2018 Course Directors Committee, Goldman School of Dental Medicine

Teaching Experience and Responsibilities

Icahn School of Medicine at Mount Sinai

2019-present Lecturer in Endocrinology, Second-year Pathophysiology Course

Tufts University School of Medicine

2016-2018 Lecturer in Endocrinology, Second-year Pathophysiology Course

Boston University School of Medicine

2003-2018 Course Director, Disease and Therapy - Endocrinology Section

1999-2018 Regular lectures to medical students, residents, and fellows on thyroid disease, diabetes insipidus, and transgender medicine

Boston University Goldman School of Dental Medicine

2002-2018 Course Director, General Medicine and Dental Correlations

2002-2018 Course Director, Medical Concerns in the Dental Patient

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Major Administrative Responsibilities

2018-present	Executive Director, Center for Transgender Medicine and Surgery, Mount Sinai Health System, New York City, NY
2016-2018	Medical Director, Center for Transgender Medicine and Surgery, Boston Medical Center, Boston, MA
2007-2018	Director, Medical Education, Endocrinology Section, Boston University School of Medicine, Boston, MA
2007-2018	Program Director, Endocrinology Fellowship Training, Boston University Medical Center, Boston, MA
1999-2003	Director, Thyroid Clinic, Boston Medical Center, Boston, MA

Other Professional Activities

Professional Societies: Memberships

2016-present	United States Professional Association for Transgender Health (USPATH)
2014-present	World Professional Association for Transgender Health (WPATH)
2007-present	Association of Program Directors in Endocrinology and Metabolism (APDEM)
2007-present	Association of Specialty Professors (ASP), Alliance of Academic Internal Medicine (AAIM)
1999-present	American Association of Clinical Endocrinologists
1998-2018	American Thyroid Association
1995-present	Endocrine Society
1994-present	American College of Physicians
1994-1996	American Federation for Medical Research
1993-2018	Massachusetts Medical Society

Professional Societies: Offices Held and Committee Assignments

International

World Athletics (formerly IAAF)

2019-present Drafting Group Member, Transgender Medical Guidelines

International Olympic Committee (IOC)

2017-present Drafting Group Member, Transgender Medical Guidelines

World Professional Association for Transgender Health (WPATH)

2016-present Writing Committee Member, Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People

2016-2018 Co-Chair, Scientific Committee, International Meeting, Buenos Aires - 2018

2015-2016 Chair, Scientific Committee, International Meeting, Amsterdam - 2016

2015-present Task Force Member, Global Education Institute

2015-present Media Liaison

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TransNet – International Consortium for Transgender Medicine and Health Research

2014-present Secretary and Co-Chair, Steering Committee

National

United States Professional Association for Transgender Health (USPATH)

2018-2019 President

Alliance of Academic Internal Medicine

2016-2019 Chair, Compliance Committee

2016-2017 Committee member, Compensation

2015-2016 President, Association of Specialty Professors (ASP)

2014-2017 Council member

2014-2019 Task Force member, Program Planning

2014-2019 Work Group member, Survey Center

2013-2015 Chair, Program Planning Committee, ASP

2012-2017 Council member, ASP

2012-2013 Chair, Membership Services Committee, ASP

2010-2015 Chair, Program Directors Site Visit Training Seminar, ASP

2007-2013 Committee member, Membership Services, ASP

American College of Physicians

2016-2018 Council of Subspecialty Societies member

Endocrine Society

2020-present Transgender Medicine, Special Interest Group member

2017-present Advisory Board member, Transgender/Disorders of Sex Development

2017-2020 Committee member, Clinical Endocrine Education

2014-present Media Liaison for Transgender Medicine

2014-2017 Task Force member, Endocrine Treatment of Transgender Persons Clinical Practice Guideline

American Board of Internal Medicine

2013-2018 Task Force member, Endocrinology Procedures

2013 Task Force member, ASP/AAIM/ACGME/ABIM Joint Next Accreditation System Internal Medicine Subspecialty Milestones

Association of Program Directors in Endocrinology and Metabolism

2017-2018 Secretary-Treasurer

2012-2018 Task Force member, Next Accreditation System Endocrinology Milestones

2011-2012 Task Force member, Procedures Accreditation

2010-2012 Council member

2009-2016 Chair, Site Visit/Curriculum Web-Toolbox Committee

American Thyroid Association

2006-2009 Publications Committee member

2004 Program Committee member

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Editorships and Editorial Boards

2018-present	Associate Editor, <i>Transgender Health</i>
2017-present	Editorial Advisory Board, <i>Endocrine News</i>
2016-present	Transgender Section Co-Editor, <i>UpToDate</i>
2015-present	Editorial Board, <i>Transgender Health</i>
2015-present	Editorial Board, <i>International Journal of Transgender Health</i>
2013-2018	Associate Editor, <i>Journal of Clinical & Translational Endocrinology</i>
2007-present	Editorial Board, <i>Endocrine Practice</i>

External Medical Advising and Consulting

International

2016-present	International transgender athlete guidelines, Medical and Scientific Commission, International Olympic Committee
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National

2017	Transgender medical and surgical treatment, National Collegiate Athletic Association,
2017	Safety for transgender medical treatment, Food and Drug Administration, United States
2015-present	Transgender workforce and military readiness, Department of Defense, United States
2014	Transgender prison population health, Federal Bureau of Prisons, United States

Regional

2011-2018	Transgender prison population health, Massachusetts Department of Correction
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Past Other Support

- 2018-2022 Keith Haring Foundation, **PI: Joshua D. Safer**, Pilot Program to Develop Clinical Program in Transgender Medicine for Children and Adolescents
- 2015-2016 R13 HD084267, **Multi-PI: Joshua D. Safer**, TransNet: Developing a Research Agenda in Transgender Health and Medicine
- 2014-2015 Boston Foundation, Equality Fund, **PI: Joshua D. Safer**, Pilot Program to Educate Physicians in Transgender Medicine
- 2013-2014 Evans Foundation, **PI: Joshua D. Safer**, A Pilot Curriculum in Transgender Medicine
- 2001-2003 Thyroid Research Advisory Council, **PI: Joshua D. Safer**, Thyroid Hormone Action on Skin
- 2001-2002 Evans Foundation, **PI: Joshua D. Safer**, Thyroid Hormone Action on Skin
- 1996-2001 K08 DK02423, **PI: Joshua D. Safer**, Characterization of Central Resistance to Thyroid Hormone

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Conferences Organized

International Conferences

World Professional Association for Transgender Health

November, 2020 Bi-annual meeting, Planning Committee (remote)

November, 2018 Bi-annual meeting, Scientific Co-Chair, Buenos Aires, Argentina

June, 2016 Bi-annual meeting, Scientific Co-Chair, Amsterdam, Netherlands

November, 2015 Global Education Initiative, inaugural conference, Chicago, IL

TransNet – International Consortium for Transgender Health and Medicine Research

May, 2016 International meeting to set transgender medicine research priorities, Amsterdam, Netherlands

May, 2015 NIH conference to set transgender medicine research priorities, Bethesda, MD

June, 2014 Inaugural meeting, Chicago, IL

National Conferences

February, 2019 Live Surgery Course for Gender Affirmation Procedures, Mount Sinai Hospital and WPATH, New York City, NY

April, 2018 Live Surgery Course for Gender Affirmation Procedures, Mount Sinai Hospital and WPATH, New York City, NY

January, 2017 United States Professional Association for Transgender Health (USPATH) bi-annual meeting, Los Angeles, CA

November, 2015 NIH/Alliance for Academic Internal Medicine - Physician Researcher Workforce Taskforce Meeting, Washington, DC

October, 2015 National Internal Medicine Subspecialty Summit, Atlanta, GA

June, 2013 Special Symposium: “Transgender Medicine – What Every Physician Should Know” Annual Meeting of the Endocrine Society, San Francisco, CA

April, 2011 2011 ASP Accreditation Seminar "Meeting the ACGME and RRC-IM Standards for Successful Fellowship Programs" Arlington, VA

Alliance for Academic Internal Medicine

April, 2015 2015 ASP Accreditation Seminar “Moving Your Fellowship Program Forward” Spring Meeting, Houston, TX

April, 2014 2014 ASP Accreditation Seminar “NAS for Medical Subspecialties Is Almost Here” Spring Meeting, Nashville, TN

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- May, 2013 2013 ASP Accreditation Seminar “A Changing Landscape in Subspecialty Fellowship Education” Spring Meeting, Lake Buena Vista, FL
- April, 2012 2012 ASP Accreditation Seminar “Meeting ACGME and RRC-IM Standards for Successful Fellowship Programs” Spring Meeting, Atlanta, GA

Invited Lectures and Presentations

International

- January, 2020 “Transgender Medicine”, World Professional Association for Transgender Health Global Education Initiative, Hanoi, Vietnam
- September, 2019 “Transgender Women” International Association of Athletics Federations (IAAF), Lausanne, Switzerland
- November, 2018 “Transgender Medicine”, World Professional Association for Transgender Health Annual Meeting, Buenos Aires, Argentina
- October, 2018 “Transgender Medicine”, Canadian Endocrine Diabetes Meeting, Halifax, NS, Canada
- June, 2018 “21^s-Century Strategies: Transgender Hormone Care” CMIN Summit 2018, Porto, Portugal
- February, 2017 “A 21st-Century Framework to for Transgender Medical Care” Sheba Hospital, Tel Aviv, Israel
- October, 2016 “A 21st-Century Approach to Hormone Treatment of Transgender Individuals” EndoBridge, Antalya, Turkey
- May, 2016 “Transgender Women” International Olympic Committee Headquarters, Lausanne, Switzerland
- October, 2015 “Workshop on Guidelines for Transgender Health Care” Canadian Professional Association for Transgender Health, Halifax, NS
- March, 2015 “Endocrinology - Hormone Induced Changes” Transgender Health Care in Europe, European Professional Association for Transgender Health, Ghent, Belgium
- June, 2014 “What to Know to Feel Safe Providing Hormone Therapy for Transgender Patients” International Congress of Endocrinology, Chicago, IL
- September, 2011 “Transgender Therapy – The Endocrine Society Guidelines” World Professional Association for Transgender Health, Atlanta, GA
- February, 2007 “Treating skin disease by manipulating thyroid hormone action” Grand Rounds, Meier Hospital, Kfar Saba, Israel
- March, 2004 “New Directions in Thyroid Hormone Action: Skin and Hair” Grand Rounds, Meier Hospital, Kfar Saba, Israel

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National

- May, 2021 “Transgender Medicine”, University of Cincinnati Medicine Grand Rounds, Cincinnati, OH (scheduled)
- September, 2020 “Transgender Medicine”, Peds Place Conference, University of Arkansas, AR (remote)
- September, 2020 “Transgender Medicine”, University of California-Irvine Medicine Grand Rounds, Irvine, CA (remote)
- June, 2020 “Transgender Medicine”, Inova Fairfax Medicine Grand Rounds, Fairfax, VA (remote)
- December, 2019 “Transgender Medicine”, Vanderbilt University Surgery Grand Rounds, Nashville, TN
- November, 2019 “Transgender Medicine”, Medical College of Wisconsin CME, Milwaukee, WI
- September, 2019 “Transgender Medicine”, Beth Israel Deaconess Medicine Grand Rounds, Boston, MA
- September, 2019 “Transgender Medicine”, United States Professional Association for Transgender Health Annual Meeting, Washington, DC
- June, 2019 “Transgender Medicine”, Mount Sinai Hospital Internal Medicine CME, New York, NY
- April, 2019 “A 21st-Century Strategy for Hormone Treatment of Transgender Individuals” National Transgender Health Summit, Oakland, CA
- March, 2019 “Transgender Medicine” National Eating Disorders Meeting, New York, NY
- January, 2019 “Transgender Medicine” Yale School of Medicine Obstetrics and Gynecology Grand Rounds, New Haven, CT
- January, 2019 “Transgender Medicine” Yale School of Medicine Endocrinology Grand Rounds, New Haven, CT
- January, 2019 “Transgender Medicine” Drexel School of Medicine Medicine Grand Rounds, Philadelphia, PA
- September, 2018 “Current Guidelines and Strategy for Hormone Treatment of Transgender Individuals” Minnesota-Midwest Chapter - American Association of Clinical Endocrinologists Annual Meeting, Minneapolis, MN
- July, 2018 “21st-Century Strategies for Transgender Hormone Care” Ohio River Valley Chapter - American Association of Clinical Endocrinologists Meeting, Indianapolis, IN
- June, 2018 “21^s-Century Strategies: Transgender Hormone Care” University of Connecticut School of Medicine, Hartford, CT

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- May, 2018 “A 21st-Century Strategy for Hormone Treatment of Transgender Individuals” American Association of Clinical Endocrinologists Annual Meeting, Boston, MA
- March, 2018 “21st-Century Strategies for Transgender Hormone Care” New Jersey Chapter - American Association of Clinical Endocrinologists Meeting, Morristown, NJ
- February, 2018 “A Strategy for the Medical Care of Transgender Individuals” Keynote Address for the International Society for Clinical Densitometry Annual Meeting, Boston, MA
- November, 2017 “A 21st-Century Strategy for Hormone Treatment of Transgender Individuals” National Transgender Health Summit, Oakland, CA
- September, 2017 “Transgender Therapy – The Endocrine Society Guidelines” Endocrine Society: Clinical Endocrinology Update, Chicago, IL
- May, 2017 “Transgender Medicine – a 21st Century Strategy for Patient Care” University of Arizona College of Medicine, Tucson, AR
- April, 2017 “Transgender Care Across the Age Continuum” Annual Meeting of the Endocrine Society, Orlando, FL
- March, 2017 “A 21st-Century Approach to Hormone Treatment of Transgender Individuals” Brown University School of Medicine, Providence, RI
- March, 2017 “What to Know: A 21st-Century Approach to Transgender Medical Care” United States Food and Drug Administration (FDA), Washington, DC
- February, 2017 “A 21st-Century Approach to Transgender Medical Care” United States Professional Association for Transgender Health, Los Angeles, CA
- February, 2017 “A 21st-Century Approach to Hormone Treatment of Transgender Individuals” Southern States American Association of Clinical Endocrinologists Annual Meeting, Memphis, TN
- December, 2016 “Transgender Medical Care in the United States Armed Forces” Global Education Initiative, World Professional Association for Transgender Health, Arlington, VA
- December, 2016 “Foundations in Hormone Treatment” Global Education Initiative, World Professional Association for Transgender Health, Arlington, VA
- November, 2016 “Developing a Transgender/Gender-Identity Curriculum for Medical Students” Association of American Medical Colleges National Meeting, Seattle, WA
- September, 2016 “A 21st-Century Approach to Hormone Treatment of Transgender Individuals” Endocrine Society: Clinical Endocrinology Update, Seattle, WA
- August, 2016 “A 21st-Century Approach to Hormone Treatment of Transgender Individuals” Oregon Health and Science University Ashland Endocrine Conference, Ashland, OR
- March, 2016 “State-of-the-Art: Use of Hormones in Transgender Individuals” Annual Meeting of the Endocrine Society, Boston, MA

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- October, 2015 “What Every Endocrinologist Should Know to Feel Safe Providing Hormone Therapy for Transgender Patients” University of Utah School of Medicine, Salt Lake City, UT
- April, 2015 “What to Know –to Feel Safe Providing Hormone Therapy for Transgender Patients” Pritzker School of Medicine, University of Chicago, Chicago, IL
- March, 2015 “What to Know –to Feel Safe with Hormone Therapy for Transgender Patients” Annual Transgender Health Symposium, Medical College of Wisconsin, Milwaukee, WI
- May, 2014 “Transgynecrinology” Annual Meeting of the American Association of Clinical Endocrinologists, Las Vegas, NV
- May, 2013 “Transgender Therapy – Hormone Action and Nuance” National Transgender Health Summit, Oakland, CA
- April, 2013 “Transgender Therapy – What Every Provider Needs to Know” Empire Conference: Transgender Health and Wellness, Albany, NY
- April, 2013 “Transgender Therapy – What Every Endocrinologist Needs to Know” University of Maryland School of Medicine, Baltimore, MD
- November, 2012 “Transgender Therapy – What Every Endocrinologist Should Know” New York University School of Medicine, New York, NY
- May, 2010 “Transgender Treatment: What Every Endocrinologist Needs to Know” Brown University School of Medicine, Providence, RI
- November, 2009 “New Directions in Thyroid Hormone Action: Skin and Hair” Emory University School of Medicine, Atlanta, GA
- November, 2009 “Primary Care Update in the Treatment of Thyroid Disorders” Emory University School of Medicine, Atlanta, GA
- October, 2008 “Topical Iopanoic Acid Stimulates Epidermal Proliferation through Inhibition of the Type 3 Thyroid Hormone Deiodinase” Annual Meeting of the American Thyroid Association, Chicago, IL
- February, 2005 “New Directions in Thyroid Hormone Action: Skin and Hair” Endocrinology Grand Rounds, University of Minnesota, Minneapolis, MN
- February, 2005 “Thyroid Hormone Action on Skin and Hair: What We Thought We Knew” Dermatology Grand Rounds, University of Minnesota, Minneapolis, MN
- December, 2004 “Transgender Therapy: The Role of the Endocrinologist” Endocrinology Grand Rounds, Brown Medical Center, Providence, RI
- November, 2003 “New Directions in Thyroid Hormone Action: Skin and Hair” Endocrinology Grand Rounds, Dartmouth Medical Center, Hanover, NH

Joshua D. Safer, MD, FACP, FACE**Regional**

- May, 2021 “Transgender Medicine”, New York GYN Society, New York, NY (scheduled)
- July, 2020 “Transgender Medicine”, LGBT Health Conference CME, New York, NY
- February, 2020 “Transgender Medicine”, Englewood Hospital Medicine Grand Rounds, Englewood, NJ
- February, 2020 “Transgender Medicine”, Endocrinology Grand Rounds, Columbia College of Physicians and Surgeons, New York, NY
- January, 2020 “Transgender Medicine”, CEI, Lake Placid, NY
- November, 2019 “Transgender Medicine”, Weill Cornell Reproductive Endocrine Grand Rounds, New York, NY
- November, 2019 “Transgender Medicine”, Acacia Network Grand Rounds, New York, NY
- October, 2019 “Transgender Medicine”, American Association of Clinical Endocrinologists - New Jersey, annual meeting, Morristown, NJ
- October, 2019 “Transgender Medicine”, Community Health Network annual conference, New York, NY
- October, 2019 “Transgender Medicine”, Westchester Medical Center Medicine Grand Rounds, Valhalla, NY
- September, 2019 “Transgender Medicine”, Weill Cornell Reproductive Endocrine CME, New York, NY
- September, 2019 “Transgender Competency for Medical Providers”, Working Group on Gender, Columbia College of Physicians and Surgeons, New York, NY
- April, 2019 “Transgender Medicine”, Weill Cornell Urology Grand Rounds, New York, NY
- June, 2018 “21^s-Century Strategies: Transgender Hormone Care” Medicine Grand Rounds, Staten Island University Hospital, Staten Island, NY
- February, 2018 “Transgender Medicine – 21st Century Strategies for Patient Care” Medicine Rounds, Newton-Wellesley Hospital, Newton, MA
- October, 2017 “Transgender Medicine – 21st Century Strategies for Patient Care” Medicine Rounds, Beth Israel-Milton Hospital, Milton, MA
- September, 2017 “Transgender Medicine – 21st Century Strategies for Patient Care” Obstetrics-Gynecology Grand Rounds, Brigham and Women’s Hospital, Boston, MA
- June, 2017 “State-of-the-Art: Hormone Therapy for Transgender Patients” Reproductive Endocrinology Rounds, Massachusetts General Hospital, Boston, MA
- May, 2017 “A 21st-Century Strategy for Medical Treatment of Transgender Individuals” Boston Medical Center and Boston University School of Medicine, Boston, MA

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- March, 2017 “A 21st-Century Strategy for Medical Treatment of Transgender Individuals” Tufts Medicine Grand Rounds, Boston, MA
- January, 2017 “What to Know: A 21st-Century Approach to Transgender Medical Care” Internal Medicine Rounds, Brigham and Women’s Hospital, Boston, MA
- March, 2016 “State-of-the-Art: Hormone Therapy for Transgender Patients” Obstetrics-Gynecology Rounds, Brigham and Women’s Hospital, Boston, MA
- November, 2015 “What Every Endocrinologist Should Know to Feel Safe Providing Hormone Therapy for Transgender Patients” Endocrinology Rounds, Tufts Medical Center, Boston, MA
- May, 2015 “What Every Endocrinologist Should Know to Feel Safe Providing Hormone Therapy for Transgender Patients” Endocrinology Rounds, Massachusetts General Hospital, Boston, MA
- December, 2014 “What to Know to Feel Safe Providing Hormone Therapy for Transgender Patients” Endocrinology Rounds, Beth Israel Deaconess Medical Center, Boston, MA
- November, 2013 “Transgender Therapy – What Every Physician Should Know” Medicine Grand Rounds, Boston Veterans Administration Hospital, Boston, MA
- May, 2005 “Transgender Therapy: The Role of the Endocrinologist”, Endocrinology Rounds, Tufts-New England Medical Center, Boston, MA
- January, 2004 “New Directions in Thyroid Hormone Action: Skin and Hair”, Endocrinology Rounds, Brigham and Women’s Hospital, Boston, MA
- October, 1999 “The Many Faces of Hypothyroidism”, Medicine Grand Rounds, Bedford Veterans Administration Hospital, Bedford, MA

Institutional, Icahn School of Medicine at Mount Sinai, New York, NY

- October, 2019 “Transgender Medicine”, East Harlem HOP rounds, New York, NY
- October, 2019 “Transgender Medicine”, Mount Sinai HIV rounds, New York, NY
- August, 2019 “Transgender Medicine”, Mount Sinai Endocrinology Fellows Conference, New York, NY
- February, 2019 “Transgender Medicine”, Mount Sinai Endocrinology Grand Rounds, New York, NY
- February, 2019 “Transgender Medicine”, Mount Sinai Ob-Gyn Grand Rounds, New York, NY
- April, 2018 “21st-Century Strategies for Transgender Hormone Care”, HIV Grand Rounds

Institutional, Boston University School of Medicine, Boston, MA

- March, 2017 “State of the Art Hormone Therapy for Transgender Patients”, Section of Infectious Disease

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- January, 2017 “What you need to know – to supervise care for our transgender patients at BMC”,
Section of Endocrinology
- February, 2016 “State of the Art Hormone Therapy for Transgender Patients”, Department of Medicine
- November, 2015 “What the Family Medicine Physician Should Know to Feel Safe Providing Hormone
Therapy for Transgender Patients”, Department of Family Medicine
- November, 2014 “What the Anesthesiologist Should Know to Feel Safe Providing Hormone Therapy for
Transgender Patients”, Department of Anesthesia
- January, 2014 “Update on the Current Guidelines for Transgender Hormone Therapy”, Section of
Endocrinology
- October, 2011 “Transgender Therapy – What Every Physician Should Know”, Department of Medicine
- February, 2011 “Current Guidelines for Transgender Hormone Therapy: What Every Endocrinologist Should
Know”, Section of Endocrinology
- November, 2005 “Thyroiditis and Other Insults to Thyroid Function” Core Curriculum in Adult Primary Care
Medicine
- November, 2005 “Interpretation of Thyroid Function Tests Made Easy” Core Curriculum in Adult Primary
Care Medicine
- January, 2005 “Transgender Therapy: The Role of the Endocrinologist” Endocrinology Grand Rounds
- December, 2004 "Update in Endocrinology: Thyroid" Medicine Grand Rounds
- January, 2004 “New Directions in Thyroid Hormone Action: Skin and Hair” Medicine Grand Rounds
- March, 2003 “Thyroid Hormone Action on Hair and Skin” Endocrinology Grand Rounds
- November, 1999 “Central Resistance to Thyroid Hormone – From Bedside to Bench” Endocrinology Grand
Rounds

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Curriculum development with external dissemination

2014-present Web site for Association of Program Directors of Endocrinology and Metabolism (APDEM), which serves as *the primary resource for endocrinology fellowship program directors throughout the United States and Canada.*

- Sample curricula
- Streaming lectures to support specific curricular needs to fill programmatic gaps at certain programs
- New assessment forms that map skills to milestones that conform to Next Accreditation System (NAS) standards of the Accreditation Council for Graduate Medical Education (ACGME)

2013-present Dissemination of Transgender Medicine Curriculum with local modification to institutions in the United States and Canada

Curriculum adopted

Johns Hopkins School of Nursing (sample video:
<http://vimeo.com/jhunursing/review/97477269/abbcf6d33a>)
Ohio State University College of Medicine
University of British Columbia, Faculty of Medicine
University of Central Florida College of Medicine
Tufts University School of Medicine

Curriculum in development

Dartmouth School of Medicine
University of Vermont College of Medicine

Work in progress in preparation for sharing transgender curriculum

Albany Medical College
Emory School of Medicine
George Washington University Medical School
Hofstra School of Medicine
University of California – San Diego School of Medicine
University of Kentucky College of Medicine
University of Louisville School of Medicine
University of Michigan Medical School
University of Minnesota Medical School
University of Nebraska School of Medicine
University of Pennsylvania School of Medicine
Washington University School of Medicine

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2013-2015 Co-author of the *Medical Subspecialty Reporting Milestones used for evaluation of Internal Medicine subspecialty medicine fellowship programs throughout the United States* by the Accreditation Council for Graduate Medical Education (ACGME).

<https://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/InternalMedicineSubspecialtyMilestones.pdf>

2011-2014 Web site content expert for APDEM, which served as *the primary resource for endocrinology fellowship Program Directors throughout the United States and Canada*. Materials included sample curricula, streaming lectures to support specific curricular needs to fill programmatic gaps at certain programs, and guidance dealing with ACGME site-visits

Other curriculum development

2019-present Massive Open On-line Course (MOOC) curricular content. Transgender Medicine for General Medical Providers, Icahn School of Medicine at Mount Sinai
(<https://www.coursera.org/courses?query=transgender%20medicine%20for%20general%20medical%20providers&>)

2016-2018 Curricular Content to teach transgender hormone therapy in the LGBT elective at Harvard Medical School

2016-2018 Curricular Content to teach transgender hormone therapy at Tufts University School of Medicine.

2011-2018 Fully revised curriculum for the Boston University Medical Center Fellowship Training Program in Endocrinology, Diabetes and Nutrition.

2010-2018 Curricula to teach transgender hormone therapy at Boston University School of Medicine.

2006-2014 Written examination in endocrinology to complement the multiple-choice examination for medical students — validation relative to success later in medical school is in progress.

Joshua D. Safer, MD, FACP, FACE**Bibliography: (ORCID  # 0000 0003 2497 8401)**

Names of mentees are underlined throughout the bibliography section

** currently most influential papers are noted with double asterisks

Original, Peer-Reviewed Articles

1. **Safer JD**, Langlois MF, Cohen R, Monden T, John-Hope D, Madura J, Hollenberg AN, Wondisford FE. Isoform variable action among thyroid hormone receptor mutants provides insight into pituitary resistance to thyroid hormone. *Mol Endocrinol* 1997;11(1):16-26. PMID 8994184
2. Langlois MF, Zanger K, Monden T, **Safer JD**, Hollenberg AN, Wondisford FE. A unique role of the beta-2 thyroid hormone receptor isoform in negative regulation by thyroid hormone - mapping of a novel amino-terminal domain important for ligand-independent activation. *J Biol Chem* 1997;272(40):24927-24933. PMID 9312095
3. **Safer JD**, Cohen RN, Hollenberg AN, Wondisford, FE. Defective release of corepressor by hinge mutants of the thyroid hormone receptor found in patients with resistance to thyroid hormone. *J Biol Chem* 1998;273(46):30175-30182. PMID 9804773
4. **Safer JD**, O'Connor MG, Colan SD, Srinivasan S, Tollin SR, Wondisford FE. The TR-beta gene mutation R383H is associated with isolated central resistance to thyroid hormone. *J Clin Endocrinol Metab* 1999;84(9):3099-3109. PMID 10487671
5. **Safer JD**, Fraser LM, Ray S, Holick MF. Topically applied triiodothyronine stimulates epidermal proliferation, dermal thickening, and hair growth in mice and rats. *Thyroid* 2001;1(8):717-724. PMID 11525263
6. Tangpricha V, Chen BJ, Swan NC, Sweeney AT, de las Morenas A, **Safer JD**. Twenty-one gauge needles provide more cellular samples than twenty-five gauge needles in fine needle aspiration biopsy of the thyroid. *Thyroid* 2001;11(10):973-976. PMID 11716046
7. **Safer JD**, Crawford TM, Fraser LM, Hoang M, Ray S, Chen TC, Persons K, Holick MF. Thyroid hormone action on skin: diverging effects of topical versus intraperitoneal administration. *Thyroid* 2003;13(2):159-165. PMID 12699590
8. Santini F, Ceccarini G, Montanelli L, Rosellini V, Mammoli C, Macchia P, Gatti G, Pucci E, Marsili A, Chopra IJ, Chiovato L, Vitto P, **Safer JD**, Braverman LE, Martino E, Pinchera A. Role for inner ring deiodination preventing transcutaneous passage of thyroxine. *J Clin Endocrinol Metab* 2003;88(6):2825-2830. PMID 12788895
9. **Safer JD**, Crawford TM, Holick MF. A role for thyroid hormone in wound healing through keratin gene expression. *Endocrinology* 2004;145(5):2357-2361. PMID 14736740
10. **Safer JD**, Crawford TM, Holick MF. Topical thyroid hormone accelerates wound healing in mice. *Endocrinology* 2005;146(10):4425-4430. PMID 15976059

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11. Saha AK, Persons K, **Safer JD**, Luo Z, Holick MF, Ruderman NB. AMPK regulation of the growth of cultured human keratinocytes. *Biochem Biophys Res Co* 2006;349(2):519-24. PMID 16949049
12. **Safer JD**, Ray S, Holick MF. A topical PTH/PTHrP receptor antagonist stimulates hair growth in mice. *Endocrinology* 2007;148(3):1167-1170. PMID 17170098
13. **Safer JD**, Persons K, Holick MF. A thyroid hormone deiodinase inhibitor can decrease cutaneous cell proliferation in vitro. *Thyroid* 2009;19(2):181-185. PMID 19191748
14. Ariza MA, Loken WM, Pearce EN, **Safer JD**. Male sex, African-American race/ethnicity, and T3 levels at diagnosis are predictors of weight gain following medication and radioactive iodine treatment for hyperthyroidism. *Endocr Pract* 2010;16(4):609-616. PMID 20350916
15. Abraham TM, de las Morenas A, Lee SL, **Safer JD**. In thyroid fine needle aspiration, use of bedside-prepared slides significantly increased diagnostic adequacy and specimen cellularity relative to solution-based samples. *Thyroid* 2011;21(3):237-242. PMID 21323589
16. Huang MP, Rodgers KA, O'Mara R, Mehta M, Abuzahra HS, Tannenbaum AD, Persons K, Holick MF, **Safer JD**. The thyroid hormone degrading Dio3 is the primary deiodinase active in murine epidermis. *Thyroid* 2011;21(11):1263-1268. PMID 21936673
17. Toraldo G, Bhasin S, Bakhit M, Guo W, Serra C, S, **Safer JD**, Bhawan J, Jasuja R. Topical androgen antagonism promotes cutaneous wound healing without systemic androgen deprivation by blocking beta-catenin nuclear translocation and cross-talk with TGF-beta signaling in keratinocytes. *Wound Repair Regen* 2012;20:61-73. PMID 22276587
- 18**. **Safer JD**, Pearce EN. A simple curriculum content change increased medical student comfort with transgender medicine. *Endocr Pract* 2013;19(4):633-637. PMID 23425656
- First ever demonstration of the effectiveness of an evidence-based approach to teaching transgender medicine to medical students
19. Thomas DD, **Safer JD**. A simple intervention raised resident-physician willingness to assist transgender patients seeking hormone therapy. *Endocr Pract* 2015;21(10):1134-42. PMID 26151424
20. Mundluru SN, **Safer JD**, Larson, AR. Unforeseen ethical challenges for isotretinoin treatment in transgender patients. *Int J of Womens Dermatol* 2016;2(2):46-48. PMID 28492004
21. Eriksson SES, **Safer JD**. Evidence-based curricular content improves student knowledge and changes attitudes towards transgender medicine. *Endocr Pract* 2016;22(7):837-841. PMID 27042742
22. Chan B, Skocylas R, **Safer JD**. Gaps in transgender medicine content identified among Canadian medical school curricula. *Transgender Health* 2016;1(1):142-150. PMID 29159305
23. Myers SC, **Safer JD**. Increased rates of smoking cessation observed among transgender women receiving hormone treatment. *Endocr Pract* 2017;23(1):32-36. PMID 27682351

Joshua D. Safer, MD, FACP, FACE

24. Berli J, Knudson G, Fraser L, Tangpricha V, Ettner R, Ettner F, **Safer JD**, Graham j, Monstrey S, Schechter L. Gender confirmation surgery: What surgeons need to know when providing care for transgender individuals. *JAMA Surgery* 2017;152(4):394-400. PMID 28196182
25. Kailas M, Lu HMS, Rothman EF, **Safer JD**. Prevalence and types of gender-affirming surgery among a sample of transgender endocrinology patients prior to state expansion of insurance coverage. *Endocr Pract* 2017;23(7):780-786. PMID 28448757
26. Liang JJ, Gardner IH, Walker JA, **Safer JD**. Observed deficiencies in medical student knowledge of transgender and intersex health. *Endocr Pract* 2017;23(8):897-906. PMID 28534684
27. Park JA, **Safer JD**. Clinical exposure to transgender medicine improves students' preparedness above levels seen with didactic teaching alone: A key addition to the Boston University model for teaching transgender health care. *Transgender Health* 2018;3(1),10-16. PMID 29344576
28. Liang JJ, Jolly D, Chan KJ, **Safer JD**. Testosterone levels achieved by medically treated transgender women in a United States endocrinology clinic cohort. *Endocr Pract* 2018; 24(2):135-142. PMID 29144822
29. Chan KJ, Jolly D, Liang JJ, Weinand JD, **Safer JD**. Estrogen levels do not rise with testosterone treatment for transgender men. *Endocr Pract* 2018; 24(4):329-333. PMID 29561193
30. Chan KJ, Liang JJ, Jolly D, Weinand JD, **Safer JD**. Exogenous testosterone does not induce or exacerbate the metabolic features associated with PCOS among transgender men. *Endocr Pract* 2018; 24(6):565-572. PMID 29624102
31. Bisson JR, Chan KJ, **Safer JD**. Prolactin levels do not rise among transgender women treated with estradiol and spironolactone. *Endocr Pract* 2018; 24(7):646-651. PMID 29708436
32. Getahun D, Nash R, Flanders D, Baird TC, Becerra-Culqui TA, Cromwell L, Hunkler E, Lash TL, Millman A, Quinn VP, Robinson B, Roblin D, Silverberg MJ, **Safer J**, Slovis J, Tangpricha V, Goodman M. Cross-sex hormones and acute cardiovascular events in transgender persons: A cohort study. *Ann Intern Med* 2018; 169(4):205-213. PMID 29987313
33. Martinson TG, Ramachandran S, Lindner R, Reisman T, **Safer JD**. High body-mass index is a significant barrier to gender confirmation surgery for transgender and gender-nonbinary individuals. *Endocr Pract* 2020; 26(1):6-15. PMID 31461357
34. Goldstein Z, Martinson TG, Ramachandran S, Lindner R, **Safer JD**. Improved rates of cervical cancer screening among transmasculine patients through self-collected swabs for high-risk human papillomavirus DNA testing. *Transgender Health* 2020; 5(1):10-17. PMID 32322684
35. Lichtenstein M, Stein L, Connolly E, Goldstein ZG, Martinson TG, Tiersten L, Shin SJ, Pang JH, **Safer JD**. The Mount Sinai patient-centered preoperative criteria meant to optimize outcomes are less of a barrier to care than WPATH SOC 7 criteria before transgender-specific surgery. *Transgender Health* 2020; 5(3):166-172. PMID 33644310
36. Hirschmann J, Kozato A, Villagra C, Wetmore J, Jandorf L, Pang JH, Reynolds M, Dodge L, Mejia S, **Safer JD**. An analysis of chaplains' narrative chart notes describing spiritual care visits with gender affirmation surgical patients. *Transgender Health* 2020; In Press. PMID

Joshua D. Safer, MD, FACP, FACE

37. Kozato A, Fox GWC, Yong PC, Shin SJ, Avanesian BK, Ting J, Ling Y, Karim S, **Safer JD**, Pang JH. No venous thromboembolism increase among transgender female patients remaining on estrogen for gender affirming surgery. *J Clin Endocrinol Metab* 2021; In Press. PMID
38. Gorbea E, Gidumal S, Kozato A, Pang JH, **Safer JD**, Rosenberg J. Insurance coverage of facial gender affirmation surgery - a review of Medicaid and commercial insurance. *Otolaryngol Head Neck Surg* 2021; In Press. PMID 33722109
39. Shin JS, Pang JH, Tiersten L, Jorge N, Hirschmann J, Kutsy P, Ashley K, Stein L, **Safer JD**, Barnett B. The Mount Sinai inter-disciplinary approach to peri-operative care improved the patient experience for transgender individuals. *Transgender Health* 2021; In Press. PMID
40. Huber S, Ferrando C, **Safer JD**, Pang JH, Streed CG, Priestly J, Culligan P. Development and validation of urologic and appearance domains of the post-affirming surgery form and function individual reporting measure (AFFIRM) for transwomen following genital surgery. *J Urol* 2021; 206:1445-1453. PMID
41. Rose AJ, Hughto JMW, Dunbar MS, Quinn EK, Deutch M, Feldman J, Radix A, **Safer JD**, Shipherd JC, Thompson J, Jasuja GK. Trends in feminizing hormone therapy for transgender patients, 2006-2017. *Transgender Health* 2021; In Press. PMID

Critical Reviews, Editorials, Chapters, Case Reports:**Editorials and Critical Reviews:**

42. **Safer JD**, Colan SD, Fraser LM, Wondisford FE. A pituitary tumor in a patient with thyroid hormone resistance: A diagnostic dilemma. *Thyroid* 2001;11(3):281-291. PMID 11327621
43. **Safer JD**, Hennessey JV, Braverman LE. Substituting brand name levothyroxine preparations with generics would increase treatment cost. *Ann Intern Med* 2005; on-line available at <http://www.annals.org/cgi/eletters/142/11/891#1882>
44. Pietras SM, **Safer JD**. A spurious elevation of both total thyroid hormone and thyroid hormone uptake measurements in the setting of autoantibodies may result in diagnostic confusion: A case report and review of the related literature. *Endocr Pract* 2008;14(6):738-742. PMID 18996795
45. **Safer JD**, Tangpricha V. Out of the Shadows: It is time to mainstream treatment for transgender patients. *Endocr Pract* 2008;14(2):248-50. PMID 18308667
46. Feldman J, **Safer JD**, Hormone therapy in adults: Suggested revisions to the sixth version of the Standards of Care. *Int J Transgender Health* 2009;11(3):146-182.
47. Bhasin S, **Safer JD**, Tangpricha V. The Hormone Foundation's patient guide to the endocrine treatment of transsexual persons. *J Clin Endocrinol Metab* 2009;94(9).
48. **Safer JD**. Thyroid hormone action on skin. *Dermatoendocrinol* 2011;3(3):1-5. PMID 22110782

Joshua D. Safer, MD, FACP, FACE

49. **Kannan S, Safer JD.** Finding the right balance between resistance & sensitivity -- A case report and brief review of the cardiac manifestations of the syndrome of resistance to thyroid hormone and the implications for treatment. *Endocr Pract* 2012; 18(2):252-255. PMID 22068246
50. **Safer JD.** Thyroid hormone action on skin. *Curr Opin Endocrinol Diabetes Obes* 2012;19(5):388-293. PMID 22914563
51. **Safer JD.** Thyroid hormone and wound healing. *J Thyroid Res* 2013;doi:10.1155/2013/124538. PMID 23577275
52. **Safer JD.** Transgender medical research, provider education, and patient access are overdue. *Endocr Pract* 2013;19(4):575-6. PMID 23337168
53. **Gardner IH, Safer JD.** Progress on the road to better medical care for transgender patients. *Curr Opin Endocrinol Diabetes Obes* 2013;20(6):553-558. PMID 24468757
54. Gitlin SD, Flaherty J, Arrighi J, Swing S, Vasiliadis J, Brater DC, Breida M, Caverzagie K, Kane GC, Nelson Grier C, Parsons P, Smith B, Morrison L, Radwany S, Quill T, Kapur V, Roberts B, Silber M, DiBisceglie A, Fix O, Koteish A, Palumbo P, Trence D, Berkowitz L, Holmboe E, Hood S, Iobst W, Levin S, Yaich S, Foster J, Jackson M, Juvin J, Williams E, Addrizzo-Harris D, Buckley J, Markowitz P, Sessler C, Torrington K, Richter S, Szyjowski R, Alguire P, Cooke M, Bolster M, Brown C, Jones T, Marks L, Pardi D, Rose Z, Shah B, Busby-Whitehead J, Granville L, Leipzig R, Collichio F, Raymond M, Von Roenn J, Albertson D, Coyle W, Sedlack R, Abbott B, Fessler H, Balasubramanian A, Danoff A, Gopalakrishnan G, Piquette C, Schulman D, Geraci M, Rockey D, **Safer J**, Armstrong W, Havlichek Jr D, Helmy T, Kolansky D, Patores S, Spevetz A, Biller B, Cantelmi A. The Internal Medicine Subspecialty Milestone Project, a joint initiative of the Accreditation Council for Graduate Medical Education and the American Board of Internal Medicine, in collaboration with the Alliance for Academic Internal Medicine. 2014; online available at <https://www.acgme.org/acgmeweb/Portals/0/PDFs/Milestones/InternalMedicineSubspecialtyMilestones.pdf>
- 55**. **Saraswat A, Weinand JD, Safer JD.** Evidence supporting the biological nature of gender identity. *Endocr Pract* 2015; 21(2):199-204. PMID 25667367
- Review of the biological nature of transgender identity most referenced by popular media (Google)
- 56**. **Weinand JD, Safer JD.** Hormone therapy in transgender adults is safe with provider supervision; A review of hormone therapy sequelae for transgender individuals. *J Clin Transl Endocr* 2015; 2:55-60. PMID 28090436
- The most comprehensive review of the relative safety of transgender hormone therapy
57. Boh B, **Safer JD.** State-of-the-art: Use of hormones in transgender individuals. *Endocrine Society* 2016; on-line available at <http://dx.doi.org/10.1210/MTP5.9781943550043.ch55>
58. **Safer JD, Coleman E, Hembree, W.** There is reason for optimism: an introduction to the special issue on research needs in transgender health and medicine. *Curr Opin Endocrinol Diabetes Obes* 2016; 23(2):165-167. PMID 26702853

Joshua D. Safer, MD, FACP, FACE

- 59**. **Safer JD**, Coleman E, Feldman J, Garofalo R, Hembree W, Radix A, Sevelius J. Barriers to healthcare for transgender individuals. *Curr Opin Endocrinol Diabetes Obes* 2016; 23(2):168-171. PMID 26910276
 - The most cited review of barriers to delivery of transgender healthcare in the United States in the medical system, medical curriculum, and medical culture
60. Feldman J, Brown GR, Deutsch MB, Hembree W, Meyer W, Meyer-Bahlburg HFL, Tangpricha V, T'Sjoen G, **Safer JD**. Priorities for transgender medical and healthcare research. *Curr Opin Endocrinol Diabetes Obes* 2016; 23(2):180-187. PMID 26825469
61. Reisner SL, Deutsch MB, Bhasin S, Bockting W, Brown GR, Feldman J, Garofalo R, Kreukels B, Radix A, **Safer JD**, Tangpricha V, T'Sjoen G, Goodman M. Advancing Methods for U.S. Transgender Health Research. *Curr Opin Endocrinol Diabetes Obes* 2016; 23(2):198-207. PMID 26845331
62. **Safer JD**. The large gaps in transgender medical knowledge among providers must be measured and addressed. *Endocr Pract* 2016;22(7):902-903. PMID 27214166
63. Bouman WP, Suess Schwend A, Motmans J, Smiley A, **Safer JD**, Deutsch MB, Adams NJ, Winter S. Language and trans health. *Int J Transgender Health* 2017;18(1):1-6.
64. **Safer JD**. The recognition that gender identity is biological complicates some previously settled clinical decision making. *AACE Clinical Case Rep* 2017;3(3):e289-e290. PMID 27967232
- 65**. Hembree WC, Cohen-Kettenis P, Gooren L, Hannema SE, Meyer WJ, Murad M, Rosenthal S, **Safer JD**, Tangpricha V, T'Sjoen G. Endocrine treatment of gender-dysphoric/gender-incongruent persons: an endocrine society clinical practice guideline. *J Clin Endocrinol Metab* 2017; 102(11):1–35. PMID 28945902
 - The most respected guideline for hormone treatment of transgender individuals
66. **Safer JD**. Transgender patients and health care providers. *Health Affairs* 2017;36(12):2213. PMID 29200359
67. Tangpricha V, Hannema SE, Irwig M, Meyer WJ, **Safer JD**, Hembree WC. 2017 American Association of Clinical Endocrinologists/Endocrine Society update on transgender medicine: case discussions. *Endocr Pract* 2017;23(12):1430-1436. PMID 29320643
68. **Safer JD**. Managing intersex and transgender health across the globe requires more than just understanding the science. *AACE Clinical Case Rep* 2018;4(3):e267-e268.
69. Narasimhan S, **Safer JD**. Hormone therapy for transgender men. *Clin Plast Surg* 2018;45(3):319-322. PMID 29908619
70. Korpaisarn S, **Safer JD**. Gaps in transgender medical education among health care providers: A major barrier to care for transgender persons. *Reviews in Endocrine and Metabolic Disorders* 2018;19(3):271-275. PMID 29922962
71. Klein P, Narasimhan S, **Safer JD**. The Boston Medical Center experience: An achievable model for the delivery of transgender medical care at an academic medical center. *Transgender Health* 2018;3(1),136-140. PMID 30065961

Joshua D. Safer, MD, FACP, FACE

72. **Safer JD.** Continuing gaps in transgender medicine education among health care providers. *Endocr Pract* 2018; 24(12):1106-1107. PMID 30715908
73. Goodman M, Getahun D, Silverberg MJ, **Safer J**, Tangpricha V. Reply to letter to the editor: Cross-sex hormones and acute cardiovascular events in transgender persons. *Ann Intern Med* 2019; 170(2):142-143. PMID 30641565
74. Iwamoto SJ, T'Sjoen G, **Safer JD**, Davidge-Pitts CJ, Wierman ME, Glodowski MB, Rothman MS. Letter to the editor: Progesterone is important for transgender women's therapy – Applying evidence for the benefits of progesterone in ciswomen. *J Clin Endocrinol Metab* 2019; 104(8):3127-3128. PMID 30860591
75. Rosenthal SM, Hembree WC, Cohen-Kettenis PT, Gooren L, Hannema SE, Meyer WJ, Murad MH, **Safer JD**, Tangpricha V, T'Sjoen GG. Reply to letter to the editor: Endocrine treatment of gender dysphoric/gender incongruent persons: An Endocrine Society* clinical practice guideline. *J Clin Endocrinol Metab* 2019; 104(11):5102-5103. PMID 31046093
76. Moser SW, Schechter LS, Facque AR, Berli JU, Agarwal C, Satterwhite T, Bluebond-Langner R, Kuzon WM, Ganor O, **Safer JD**, Knudson G. Nipple areolar complex reconstruction is an integral component of chest reconstruction in the treatment of transgender and gender diverse people. *Int J Transgender Health* 2019; In Press. PMID
77. Korpaisarn S, **Safer JD**. Etiology of gender identity. *Endocrinol Metab Clin N Am* 2019; 48(2):323-329. PMID 31027542
- 78**. **Safer JD**, Tangpricha V. Care of the transgender patient. *Ann Intern Med* 2019; 171(1):ITC1-ITC6. PMID 31261405
- The highest profile review of transgender medicine oriented to primary care providers
79. Goldstein Z, Khan M, Reisman T, **Safer JD**. Managing the risk of venous thromboembolism in transgender adults undergoing hormone therapy. *J Blood Med* 2019; 10:209-216. PMID 31372078
80. Rosen HN, Hamnvik OPR, Unnop J, Malabanan AO, **Safer JD**, Tangpricha V, Wattanachanya L, Yeap SS. Bone densitometry in transgender and gender non-conforming (TGNC) individuals: The 2019 ISCD official positions. *J Clin Densitometry* 2019; 22(4):544-553. PMID 31327665
81. **Safer JD**. Hurdles to health care access for transgender individuals. *Nat Hum Behav* 2019; 3:1132-1133. PMID 31406336
82. **Safer JD**. Greater rigor studying the incidence of sexually transmissible infections among transgender individuals. *Med J Aust* 2019; 211(9):401. PMID 31595513
83. **Safer JD**. Advancing knowledge of transgender medical intervention effects. *Nat Rev Urol* 2019; 16(11):642-643. PMID 31399706
84. Reisman T, Goldstein Z, **Safer JD**. A review of breast development in cisgender women and implications for transgender women. *Endocr Pract* 2019; 25:1338-1345. PMID 31412232

Joshua D. Safer, MD, FACP, FACE

- 85**. **Safer JD**, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381(25):2451-2460. PMID 31851801
- The highest profile review of transgender medicine
86. Libman H, **Safer JD**, Siegel JR, Reynolds EE. Caring for the transgender patient: Grand rounds discussion from Beth Israel Deaconess Medical Center. *Ann Intern Med* 2020; 172(3):202-209. PMID 32016334
87. Pang JH, **Safer JD**. A beginning in the investigation of the metabolic consequences of transgender hormone treatment on young people. *J Clin Endocrinol Metab* 2020; 105(3):1-2. PMID 31803926
88. Hassett MJ, Somerfield MR, Baker ER, Cardoso F, Kansal KJ, Kwait DC, Plichta JK, Ricker C, Roshal A, Ruddy KJ, **Safer JD**, Van Poznak C, Yung RL, Giordano SH. Management of Male Breast Cancer: ASCO Guideline. *J Clin Oncol* 2020; 38(16):1849-1863. PMID 32058842
89. Prince CJ, **Safer JD**. Endocrine treatment of transgender individuals: Current guidelines and strategies. *Expert Rev Endocrinol Metab* 2020; 15(6):395-403. PMID
90. **Safer JD**, Tangpricha V. Guidance for collecting sex/gender data in research. *Endocr Pract* 2020; 26(10):1225-1226. PMID 33471722
91. **Safer JD**. Using evidence to fill gaps in the care of transgender people. *Endocr Pract* 2020; 26(11):1387-1388. PMID 33471668
92. Slack DJ, **Safer JD**. Cardiovascular health maintenance in aging individuals: The implications for transgender men and women on hormone therapy. *Endocr Pract* 2021; 27(1):63-70. PMID 33475503
93. Walch A, Davidge-Pitts C, **Safer JD**, Lopez X, Tangpricha, V, Iwamoto SJ. Proper care of transgender and gender diverse persons in the setting of proposed discrimination: A policy perspective. *J Clin Endocrinol Metab* 2021; 106(2):305-308. PMID 33326028
94. Pang JH, **Safer JD**. An opportunity to better assess breast development in transgender women. *J Clin Endocrinol Metab* 2021; 106(3):e1453-e1454. PMID 33332566
95. **Safer JD**. Research gaps in medical treatment of transgender/non-binary people. *J Clin Invest* 2021; 131(4):e142029. PMID 33586675
96. Reisman T, **Safer JD**. New data to challenge gender affirming hormone therapy prescribing practice. *J Clin Endocrinol Metab* 2021; 106(5):e2365-e2366. PMID 33524111
97. Walch A, Davidge-Pitts C, Lopez X, Tangpricha, V, Iwamoto SJ, **Safer JD**. Response to Letter to the Editor from Malone: "Proper Care of Transgender and Gender Diverse Persons in the Setting of Proposed Discrimination: A Policy Perspective". *J Clin Endocrinol Metab* 2021; 106(8): e3295–e3296. doi:10.1210/clinem/dgab206
98. Zucker R, Reisman T, **Safer JD**. Minimizing venous thromboembolism in feminizing hormone therapy: applying lessons from cisgender women and previous data. *Endocr Pract* 2021; In Press. PMID

Joshua D. Safer, MD, FACP, FACE

99. Kumar A, Amakiri UO, Safer JD. Medicine as constraint: assessing the barriers to gender-affirming care. *Cell Reports Medicine* 2022; In Press. PMID
100. **Safer JD**. Are the pharmacokinetics of sublingual estradiol superior or inferior to those of oral estradiol? *Endocr Pract* 2022; In Press. PMID

Textbook Chapters:

101. **Safer JD**, Wondisford, FE. 1997 TSH, normal physiology, *Contemporary Endocrinology: Diseases of the Pituitary*, Wierman ME, ed., Humana Press Inc., Totowa, NJ, 283-293
102. **Safer JD**. 2003 Resistance to thyroid hormone, *Contemporary Endocrinology: Diseases of the Thyroid*, 2nd Edition, Braverman LE, ed., Humana Press Inc., Totowa, NJ, 199-216
103. **Safer JD**. 2005 The skin in thyrotoxicosis, *Werner and Ingbar's The Thyroid*, 9th Edition, Braverman LE and Utiger RD, eds., Lippincott Williams and Williams, Philadelphia, PA, 553-558
104. **Safer JD**. 2005 The skin and connective tissue in hypothyroidism, *Werner and Ingbar's The Thyroid*, 9th Edition, Braverman LE and Utiger RD, eds., Lippincott Williams and Williams, Philadelphia, PA, 769-773
105. **Safer JD**, Holick MF. 2008 Potential therapeutic uses of thyroid hormone, *Thyroid Disorders with Cutaneous Manifestations*, Heymann WR, ed., Springer-Verlag, London, UK, 181-186
106. Leung AM, **Safer JD**. 2012 Thyrotoxicosis of extra thyroid origin, *Werner and Ingbar's The Thyroid*, 10th Edition, Braverman LE and Cooper D, eds., Lippincott Williams and Williams, Philadelphia, PA, 429-433
107. Kurani PN, Goldberg LJ, Safer JD. 2017 Evaluation and management of hirsutism in postmenopausal women, *Essentials of Menopause Management: A Case-Based Approach*, Pal L and Sayegh RA, eds., Springer, London, UK, 209-221
108. Sloan CA, **Safer JD**. 2017 The high risk client: Comorbid conditions that affect care, *Adult Transgender Care: An Interdisciplinary Approach for Training Mental Health Professionals*, Kauth MR and Shipherd JC, eds., Routledge, Taylor and Francis, London, UK, 101-122
109. Webb R, Safer JD. 2018 Transgender hormonal treatment, *Yen and Jaffe's Reproductive Endocrinology, edition 8*, Strauss JS and Barbieri JL, eds., Elsevier, Maryland Heights, MO, 709-716
110. Myers SC, Safer JD. 2019 Hormone therapy in transgender adults, *Manual of Endocrinology and Metabolism, 5th Edition*, Lavin N, ed., Walters Kluwer, Philadelphia, PA, 893-899
111. **Safer JD**, Chan KJ. 2019 Review of medical, socioeconomic, and systemic barriers to transgender care. *Transgender Medicine, A Multidisciplinary Approach*, Poretsky L and Hembree WC, eds., Humana Press, Cham, Switzerland, 25-38
112. Qian R, Safer JD. 2019 Hormone treatment for the adult transgender patient. *Comprehensive Care of the Transgender Patient*, Ferrando CA, ed., Elsevier, Maryland Heights, MO, 34-96

Joshua D. Safer, MD, FACP, FACE

113. Tangpricha V, **Safer JD**. 2020 Hormone therapy for transgender women. *Gender Confirmation Surgery*, Schechter LS, ed. Springer, Cham, Switzerland, 59-63
114. **Safer JD**, Tangpricha V. 2020 Hormone therapy for transgender men. *Gender Confirmation Surgery*, Schechter LS, ed. Springer, Cham, Switzerland, 65-67
115. Park JA, **Safer JD**. 2020 Optimizing the use of gender-affirming therapies. *Essentials of Men's Health*, Bhasin S, O'Leary MP, and Basaria SS, eds. McGraw Hill, New York, NY, 325-336
116. Reisman T, **Safer JD**. 2022 Perioperative estrogen considerations for transgender women undergoing vaginoplasty. *A Case-Based Guide to Clinical Endocrinology*, Davies TF, ed. Springer, Cham, Switzerland, https://doi.org/10.1007/978-3-030-84367-0_57

Case Reports:

117. Koutkia P, **Safer JD**. Adrenal metastasis secondary to papillary thyroid carcinoma. *Thyroid* 2001; 11(11):1077-1079. PMID 11762719
118. Choong K, **Safer JD**. Graves disease and gynecomastia in two roommates. *Endocr Pract* 2011; 17(4):647-650. PMID 21613048
119. Safer DL, Bullock KD, **Safer JD**. Obsessive-compulsive disorder presenting as gender dysphoria/gender incongruence: a case report and literature review. *AACE Clinical Case Rep* 2016; 2:e268–e271.
120. Stevenson MO, Wixon N, **Safer JD**. Scalp hair regrowth in hormone-treated transgender woman. *Transgender Health* 2017; 1(1):202-204. PMID 28861534
121. Sullivan CA, Hoffman JD, **Safer JD**. 17- β -hydroxysteroid dehydrogenase type 3 deficiency: Identifying a rare cause of 46, XY female phenotype in adulthood. *J Clin Transl Endocr Case Rep* 2018; 7:5-7.
122. Greenwald P, Dubois B, Lekovich J, Pang JH, **Safer JD**. Successful IVF in a cisgender female carrier using oocytes retrieved from a transgender man maintained on testosterone. *AACE Clinical Case Rep* 2022; 8:19-21. PMID

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Dissemination Through Lay Press and Social Media

Mass Audience Programming:

“Transgender Health AMA” Reddit. July 24, 2017. Expert responses to questions about transgender medicine. https://www.reddit.com/r/science/comments/6p7uhb/transgender_health_ama_series_im_joshua_safer/ over 150,000 views, over 4200 comments

“Gender Revolution with Katie Couric” National Geographic Channel. Couric, Katie. February 6, 2017. Extended interview with Katie Couric threaded into a 2-hour television special. Trailer: <https://www.youtube.com/watch?v=y93MsRaC6Zw> broadcast in 143 countries

“Is gender identity biologically hard-wired?” Judd, Jackie. PBS NewsHour. May 13, 2015. Extended interview for Jackie Judd <http://www.pbs.org/newshour/bb/biology-gender-identity-children/> estimated just over 1,000,000 viewers per Nielsen

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Innovation	Significance/impact
<i>Development and leadership of the Transgender Medicine Clinical Center, Mount Sinai Health System and Icahn School of Medicine at Mount Sinai</i>	<ul style="list-style-type: none"> • The Center for Transgender Medicine and Surgery at Mount Sinai is the first comprehensive center for transgender medical care in New York and the most comprehensive program in the United States • The Center is one of only several such centers in North America that are housed in academic teaching hospitals where care can be integrated • The Center is a model for such care delivery in North America.
<i>Establishment, development, and leadership of the Transgender Medicine Clinical Center at Boston Medical Center</i>	<ul style="list-style-type: none"> • The Center for Transgender Medicine and Surgery at BMC is the first comprehensive center for transgender medical care in New England • The Center is one of only several such centers in North America that are housed in academic teaching hospitals where care can be integrated • The Center is a model for such care delivery in North America.
<i>Development and dissemination of the seminal reviews that are most widely cited in the lay press that explain the concept that gender identity is a biological phenomenon (see bibliography section above, e.g. PMID: 25667367).</i>	<ul style="list-style-type: none"> • The concept that gender identity is a biological phenomenon has been a key component of the recent culture change in favor of mainstream medical care for transgender individuals (see media section above)
<i>Development and dissemination of new and influential curricular content to teach the biology of gender identity in conventional medical education (see curriculum section above)</i>	<p>The teaching of evidence-based approaches to transgender medical care to:</p> <ul style="list-style-type: none"> • Medical students (see bibliography section above, e.g. PMID 23425656 and PMID 27042742) • Physician trainees (see bibliography section above, e.g. PMID 26151424) • Practicing physicians (see invited lectures section above) serves as a crucial component to the gained credence given to care for transgender individuals in conventional medical settings.
<i>Development and dissemination of seminal reviews supporting the safety of transgender hormone treatment regimens (see invited lectures section above)</i>	<ul style="list-style-type: none"> • Once mainstream medical providers learn of the biology underlying gender identity, their biggest concern is the relative safety of the medical interventions relative to the benefit. • The development and dissemination of the seminal reviews and lectures supporting the safety of current treatment regimens serves as a further crucial component to the culture change among conventional medical providers in favor of routine medical care for transgender individuals

Exhibit 25

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

B.P.J. by her next friend and mother, HEATHER JACKSON,

Plaintiff,

v.

WEST VIRGINIA STATE BOARD OF EDUCATION, HARRISON COUNTY BOARD OF EDUCATION, WEST VIRGINIA SECONDARY SCHOOL ACTIVITIES COMMISSION, W. CLAYTON BURCH in his official capacity as State Superintendent, DORA STUTLER in her official capacity as Harrison County Superintendent, and THE STATE OF WEST VIRGINIA,

Defendants,

and

LAINY ARMISTEAD,

Defendant-Intervenor.

Civil Action No. 2:21-cv-00316

Hon. Joseph R. Goodwin

**REBUTTAL EXPERT REPORT AND DECLARATION OF
JOSHUA D. SAFER, MD, FACP, FACE**

1. I have been retained by counsel for Plaintiff as an expert in connection with the above-captioned litigation.

2. My background and credentials are set forth in my previous expert report and declaration dated January 21, 2022 (“Safer Rep.”). I incorporate all conclusions and facts set forth in my previously submitted report into this rebuttal report as if fully stated herein.

3. I reviewed the expert reports of Gregory A. Brown, Ph.D. and Chad. A. Carlson, M.D., submitted in this case on February 23, 2022 (“Brown Rep.” and “Carlson Rep.”). I provide

this rebuttal report to explain the overall problems with the conclusions they draw and provide data showing why such conclusions are in error. I reserve the right to supplement my opinions in response to new information if necessary as the case proceeds.

SUMMARY OF OPINIONS

4. In this rebuttal report, I address four topics raised in the expert reports of Dr. Brown and Dr. Carlson that are related to this lawsuit.¹

- a. H.B. 3293's definition of "biological sex" as "reproductive biology and genetics at birth" is inaccurate and misleading. Especially in the context of transgender people or people with intersex characteristics, "biological sex" includes all the biological components of sex, including hormones and the biological underpinnings of gender identity.
- b. Circulating testosterone is the primary known biological driver of average differences in athletic performance, not "reproductive biology and genetics at birth." Differences in athletic performance between cisgender boys and girls before puberty are minor and cannot reliably be attributed to biological factors instead of social ones.
- c. Concerns about athletic advantage do not provide a scientific basis for H.B. 3293's categorical ban of transgender girls and women from all girls' teams sponsored by

¹ It is my understanding that H.B. 3293 seeks to exclude girls and women who are transgender if they are a student at a secondary school or institution of higher education in West Virginia. As a result, several of the studies discussed and conclusions reached by Dr. Brown and Dr. Carlson in their reports are unrelated to H.B. 3293 (e.g., discussions regarding elite athletes, such as Olympians). Although there are several issues with Dr. Carlson's and Dr. Brown's statements regarding these inapposite studies and the conclusions they reach are nothing more than conjecture, given that these studies are not related to H.B. 3293, I do not exhaustively respond to each inaccurate or misleading statement here.

a secondary school or institution of higher education in West Virginia. There is no basis to expect that transgender girls who receive puberty delaying medication followed by gender affirming hormones would have an athletic advantage, and Dr. Brown's sweeping arguments about an athletic advantage for transgender women who suppress testosterone after puberty are based on supposition and conjecture, not evidence.

- d. Concerns about safety also do not provide a scientific basis for H.B. 3293's categorical ban of transgender girls and women from all girls' teams sponsored by a secondary school or institution of higher education in West Virginia. Dr. Carlson's speculative arguments about safety risks apply only to contact and collision sports, and actual safety concerns can be addressed through even-handed rules instead of discriminating based on transgender status.

H.B. 3293'S DEFINITION OF "BIOLOGICAL SEX" IS INACCURATE AND MISLEADING

5. Ignoring all the other biological components of sex, H.B. 3293 defines "biological sex" exclusively as "an individual's physical form as a male or female based solely on the individual's reproductive biology and genetics at birth." As I explained in my initial report, however, the phrase "biological sex" is an imprecise term that can cause confusion, especially in the context of transgender people and people with intersex characteristics. A person's sex encompasses the sum of several different biological attributes, including sex chromosomes, certain genes, gonads, sex hormone levels, internal and external genitalia, other secondary sex characteristics, and the biological underpinnings of gender identity. Those attributes are not always aligned in the same direction. *See Hembree WC, et al. Endocrine Treatment of Gender-Dysphoria/Gender Incongruent Persons: An Endocrine Society Clinical Practice Guideline. J Clin*

Endocrinol Metab 2017; 102:3869–3903 (“Endocrine Society Guidelines 2017”) at 3875; Safer JD, Tangpricha V. *Care of Transgender Persons*. *N Engl J Med* 2019; 381:2451-2460 (“*N Engl J Med* 2019”).

6. In response to my initial report, Dr. Brown states that sex is rooted in biology. (Brown Rep. ¶¶ 1-3). I agree. But the fact that sex is rooted in biology does not mean that sex is defined exclusively by genetics or reproductive biology at birth. As reflected in the same sources cited by Dr. Brown, dimorphous sexual characteristics in men and women are produced by a combination of genes, prenatal androgen exposure to sex hormones, epigenetics and other environmental factors. Bhargava, A. et al. *Considering Sex as a Biological Variable in Basic and Clinical Studies: An Endocrine Society Scientific Statement*. *Endocr Rev.* 2021; 42:219-258 (“Bhargava 2021”) at 221-228; *N Engl J Med* 2019; Safer JD, Tangpricha V. *Care of the Transgender Patient*. *Ann Intern Med* 2019; 171: ITC1-ITC16 (“*Ann Intern Med* 2019”).

7. In addition, although the precise biological causes of gender identity are unknown, gender identity itself has biological underpinnings, possibly as a result of variations in prenatal exposure to sex hormones, gene sequences, epigenetics, or a combination of factors. And when transgender people receive puberty-delaying treatment and gender-affirming hormones, they develop other biological and physiological sex characteristics that align with their gender identity and not with their sex recorded at birth. *Endocrine Society Guidelines 2017* at 3874-75, 3888-89; Bhargava 2021 at 227; *N Engl J Med* 2019; *Ann Intern Med* 2019.

THE PRIMARY KNOWN BIOLOGICAL DRIVER OF AVERAGE DIFFERENCES IN ATHLETIC PERFORMANCE IS CIRCULATING TESTOSTERONE

8. As explained in my previous report, the primary known biological cause of average differences in athletic performance between non-transgender men as a group and non-transgender women as a group is circulating testosterone—not “reproductive biology and genetics at birth.”

The existing “evidence makes it highly likely that the sex difference in circulating testosterone of adults explains most, if not all, of the sex differences in sporting performance.” *See* Handelsman DJ, et al. *Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance*. *Endocrine Reviews* 2018; 39:803-829 (“Handelsman 2018”) at 823 (summarizing evidence rejecting hypothesis that physiological characteristics are driven by Y chromosome).²

9. Neither Dr. Brown nor Dr. Carlson disputes that circulating testosterone is the largest biological driver of average differences in athletic performance (Brown Rep. ¶ 114; Carlson Rep. ¶ 16), but Dr. Brown contends that cisgender boys and transgender girls have at least some biological advantages in athletic performance over cisgender girls even before puberty. In support, Dr. Brown relies primarily on demographic data from physical fitness tests or athletics in which prepubertal cisgender boys have outperformed prepubertal cisgender girls. But there is no reliable basis for Dr. Brown to attribute those differences to biology instead of social factors such as greater societal encouragement of athleticism in boys, greater opportunities for boys to play sports, or different preferences of the boys and girls surveyed. *See* Handelsman DJ. *Sex Differences in Athletic Performance Emerge Coinciding with the Onset of Male Puberty*. *Clin Endocrinol (Oxf)*. 2017;87(1):68–72 (“Handelsman 2017”).

10. Dr. Brown also points out that there are physiological differences between cisgender boys and cisgender girls before puberty, largely as a result of exposure to hormones in

² Dr. Brown cites to Handelsman in his report but continually misrepresents Handelsman’s findings, notably omitting key portions of the reference. For example, Dr. Brown writes, “[t]here is convincing evidence that the sex differences in muscle mass and strength are sufficient to account for the increased strength and aerobic performance of men compared with women and is in keeping with the differences in world records between the sexes.” (Brown Rep. ¶ 55, citing Handelsman 2018). But Dr. Brown omits the following sentence which explains that “[t]he basis for the sex difference in muscle mass and strength is *the sex difference in circulating testosterone*.” (Handelsman 2018 at 816) (emphasis added).

utero or during infancy. (Brown Rep. ¶ 71 (citing McManus, A. and N. Armstrong, *Physiology of Elite Young Female Athletes*. J Med & Sport Sci 2011; 56:23-46)). But the article cited by Dr. Brown never draws a causal connection between those physiological differences and any differences in athletic performance between cisgender prepubertal boys and girls. Throughout the article, McManus and Armstrong acknowledge that differences between cisgender prepubertal boys and girls in various measurements are minimal or nonexistent. *See Id.* at 24 (“Prior to 11 years of age differences in average speed are minimal”); at 27 (“small sex difference in fat mass and percent body fat are evident from mid-childhood”); at 29 (“bone characteristics differ little between boys and girls prior to puberty”); at 32 (“There is little evidence that prior to puberty pulmonary structure or function limits oxygen uptake”); at 34 (“[N]o sex differences in arterial compliance have been noted in pre- and early- pubertal children”).

11. There is also no basis to confidently predict that patterns about the athletic performance of prepubertal cisgender boys will be the same for prepubertal transgender girls. To the extent that differences in performance are influenced by social influences, biases, or preferences, the experience of transgender girls might be more similar to the experience of cisgender girls than to cisgender boys. And to the extent that differences in performance are shown to have some connection to epigenetics or exposure to sex hormones in utero or infancy, we do not know whether those biological factors are always equally true for transgender girls in light of scientific studies documenting potential biological underpinnings of gender identity.

12. For example, studies have shown that even before initiating hormone therapy transgender women tend to have lower bone density than cisgender men. Van Caenegem E, Taes Y, Wierckx K, Vandewalle S, Toye K, Kaufman JM, et al. *Low Bone Mass is Prevalent in Male-to-Female Transsexual Persons Before the Start of Cross-Sex Hormonal Therapy and*

Gonadectomy. Bone 2013;54(1):92–7. We do not know whether those differences are explained by social factors or biological ones. But regardless of the cause, it cannot be assumed that the physiological characteristic of cisgender boys and men will automatically apply to transgender girls and women even in the absence of gender affirming hormones.

**CONCERNS ABOUT ATHLETIC ADVANTAGE
DO NOT PROVIDE A SCIENTIFIC BASIS FOR H.B. 3293**

13. In my previous report, I explained why “[t]here is no medical justification for West Virginia’s categorical exclusion of girls who are transgender from participating in scholastic athletics on the same teams as other girls.” (Safer Rep. ¶ 46). By excluding girls who are transgender based on “biological sex,” and defining that term to mean “reproductive biology and genetics at birth,” West Virginia categorically prevents girls who are transgender from participating on all girls’ teams sponsored by a secondary school or institution of higher education in West Virginia regardless of the particular sport at issue and regardless of whether they are pre-pubertal, receiving puberty blockers, or receiving gender-affirming hormone therapy. That sweeping and categorical ban is dramatically out of step with even the most stringent policies of elite international athletic competitions for girls and women who are transgender.

14. To support this sweeping ban, Dr. Brown makes a variety of claims that are either irrelevant or are based on speculation and inferences that are not supported by the data that we currently have.

15. As an initial matter, Dr. Brown provides no scientific support for excluding girls and women who are transgender and who had puberty blockers before endogenous puberty. To the contrary, even some of the most exclusionary policies cited by Dr. Brown allow transgender girls and women to participate if they did not experience endogenous puberty. *See* World Rugby Transgender Women’s Guidelines 2020 (“Transgender women who transitioned pre-puberty and

have not experienced the biological effects of testosterone during puberty and adolescence can play women’s rugby”).³

16. Dr. Brown contends that “there is no published scientific evidence that the administration of puberty blockers to males before puberty eliminates the pre-existing athletic advantage that prepubertal [transgender girls] have over prepubertal [cisgender] females.” (Brown Rep. at 56). But as I explain above, there is no evidence that prepubertal transgender girls have any such pre-existing biological athletic advantages. *See supra* ¶¶ 9-12.

17. Dr. Brown’s assertions also rest on a misunderstanding of the treatment of gender dysphoria. Indeed, Dr. Brown admits that his speculation about puberty blockers is outside his area of expertise. (Brown Rep. ¶ 110). Under current standards of care, transgender adolescents are eligible to receive puberty blockers when they reach Tanner 2—not Tanner 3—which is early enough to prevent endogenous puberty from taking place. *See* Endocrine Society Guidelines 2017 at 3869-3903. Following administration of puberty blockers, transgender girls and women will have also received gender-affirming care to allow them to go through puberty consistent with their female gender identity. As a result of a typically female puberty, these transgender girls and women will develop many of the same physiological and anatomical characteristics of cisgender girls and women, including bone size (Brown Rep. ¶¶ 46-48), skeletal structure (*id.* at ¶ 49), and “distinctive aspects of the female pelvis geometry [that] cut against athletic performance” (*id.* at ¶ 50). Thus, a transgender girl or women who received puberty blockers followed by gender-affirming hormones does not have the same physiology as a prepubertal cisgender boy.⁴

³ *See* <https://www.world.rugby/thegame/player-welfare/guidelines/transgender/women>

⁴ Dr. Brown cites to a study measuring body composition among transgender people who received puberty delaying medication followed by gender affirming hormones. (Brown Rep. ¶¶ 112-13 (citing Klaver M, et al. *Early Hormonal Treatment Affects Body Composition and Body Shape in*

18. Dr. Brown also cannot point to data justifying H.B. 3293's exclusion of transgender girls and women who experience endogenous puberty and then lower their levels of circulating testosterone. As I explained in my original report, concerns about athletic competition among college students and adults are more attenuated for students in middle school and high school, where athletes' ages typically range from 11-18, with different athletes in different stages of pubertal development. Increased testosterone begins to affect athletic performance at the beginning of puberty, but those effects continue to increase each year of puberty until about age 18, with the full impact of puberty resulting from the cumulative effect of each year. As a result, a 14, 15, or 16-year old has experienced less cumulative impact from testosterone than a 17 or 18-year old.

19. But even with respect to college students, Dr. Brown's sweeping arguments are not supported by his data. There have been only two studies that examined the effects of gender-affirming hormone therapy on the athletic performance of transgender female athletes. (Safer Rep. ¶¶ 55-57). The first is a small study of eight adult long-distance runners showing that when women who are transgender have lowered circulating testosterone, their performance when compared to non-transgender women was proportionally the same as their performance had been before treatment relative to non-transgender men. Harper J. *Race Times for Transgender Athletes*. *Journal of Sporting Cultures and Identities* 2015; 6:1-9. The second is a retrospective study that reviewed military fitness test results, showing that two years of gender-affirming hormone therapy negated any advantage transgender women had over non-transgender women in performing push-ups and

Young Transgender Adolescents. *J Sex Med* 2018; 15: 251-260)). This study confirms that the transgender women after treatment had body composition patterns that more closely resembled cisgender women than cisgender men (or cisgender prepubertal boys). The minimal remaining differences reported in some measurements are not large enough to plausibly confer a material athletic advantage, and those differences are likely attributable to the fact that the subjects do not appear to have started receiving treatments until ages 12.8 to 13.5 at the earliest. By contrast, the start of Tanner 2 for transgender girls usually begins at about age 11.5.

sit-ups, but did not completely negate transgender women's faster times in racing 1.5 miles. Roberts TA, et al. *Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organizations and legislators*. Br J Sports Med. 2020; 0:1–7. doi:10.1136/bjsports-2020-102329.

20. Neither of these studies provides enough data to support Dr. Brown's sweeping claim that transgender women who have lowered circulating testosterone have an advantage over cisgender women in all athletic events. To support that inference, Dr. Brown cites to a variety of studies of transgender women measuring discrete physiological characteristics such as muscle size or grip strength. (Brown Rep. ¶¶ 153-56). Dr. Brown predicts that if puberty-influenced characteristics like bone and muscle size are not completely reversed by testosterone suppression, then those characteristics will continue to provide an advantage for transgender women. But because changes in testosterone affect different parts of the body in different ways, we do not have enough information to confidently predict whether the combined effect of the changes will be an advantage or a disadvantage.

21. The study about military fitness tests (Roberts 2020) illustrates the point. Roberts TA, et al. *Br J Sports Med*. 2020; 0:1–7. After two years of suppressing testosterone any advantage that the transgender women had in performing push-ups or sit-ups was eliminated. But because the transgender women in the study weighed more than the cisgender women even after suppressing testosterone, the transgender women had to use more muscle strength to perform the same number of push-ups. In other words, the transgender women may have had more muscle strength, but that greater strength did not translate into an athletic advantage in a push-up contest. Because different sports require different types of physical performance, the existence and extent

of any performance advantage based on grip strength or leg-muscle size may vary from sport to sport and cannot support a categorical across-the-board rule.

22. Dr. Brown also refers to widely publicized anecdotes about isolated cases of transgender girls and women winning state championships in high school sports or NCAA championships in college. But transgender athletes and women have been competing in NCAA and secondary school athletics for many years at this point, and they remain dramatically underrepresented amongst champions. The occasional championships that have been widely publicized do not come close to constituting the rates one would expect if they won at rates that are proportional to their overall percentage of the population (which is approximately 1%).

**CONCERNS ABOUT SAFETY DO NOT PROVIDE
A SCIENTIFIC BASIS FOR H.B. 3293**

23. Dr. Carlson argues in his report that allowing transgender girls and women to participate on women's teams "creates significant additional risk of injury for the [cisgender] female participants competing alongside these transgender athletes." (Carlson Rep. at 2).

24. Even on their own terms, none of Dr. Carlson's arguments support H.B. 3293's categorical ban of all girls who are transgender from all girls' sports teams. Dr. Carlson's safety arguments relate solely to contact and collision sports and to physical characteristics developed during puberty. By contrast, H.B. 3293 applies even to non-contact sports like cross-country, and it applies even to transgender girls and women who have never experienced endogenous puberty as a result of hormone blocking medication and gender-affirming hormones.⁵

⁵ The declaration Dr. Carlson submitted earlier in this case dealt exclusively with physiological characteristics acquired during puberty. In his more recent report, Dr. Carlson vaguely asserts that "the conclusions of this paper can apply to a certain extent before . . . puberty" (Carlson Rep. at 56) but he does not attempt to argue that the relatively small differences in performance or physiology observed before puberty come anywhere close to creating an actual safety risk.

25. To the extent that Dr. Carlson's arguments related to some applications of H.B. 3293, those arguments are based on stereotypes and suppositions, not actual evidence that transgender girls and women pose a safety threat. Although transgender girls and women have been playing in NCAA and secondary school sports for at least the past 10 years, Dr. Carlson does not identify any instance in which a cisgender girl or woman has actually been injured as a result of competing against a girl or woman who is transgender. Rather, he theorizes that a greater number of people are identifying as transgender and that sporting organizations should adopt restrictions preemptively in response to what he characterizes as "this rapid social change." (Carlson Rep. at 59).

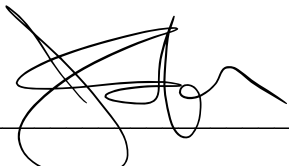
26. Dr. Carlson repeats the same mistakes as Dr. Brown by drawing unsubstantiated inferences about transgender women based on data from cisgender men and from measurements of discrete characteristics. As discussed above, we do not currently have sufficient information to predict how all the physiological effects of testosterone suppression will interact in combination each other or whether they will produce the same kinetic energy as typically produced by cisgender men. For instance, having larger bones without corresponding levels of testosterone and muscle mass would mean that a runner has a bigger body to propel with less power to propel it.

27. Dr. Carlson does not offer a cogent explanation for why alleged safety concerns based on average differences in size and strength should be addressed with an across-the-board exclusion of transgender women as opposed to tailored, non-discriminatory policies. Like Dr. Brown's arguments about athletic advantage, Dr. Carlson's arguments about safety must be considered in the context of all the intra-sex variations in height, weight, and muscle mass that pose comparable safety risks. Athletic organizations can protect athlete safety for women without drawing categorical lines based on transgender status.

CONCLUSION

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on 3/10/2022



Joshua D. Safer, MD, FACP, FACE

Exhibit 26

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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA

* * * * *

B.P.J., by her next friend and
mother, HEATHER JACKSON,
Plaintiffs
vs.
WEST VIRGINIA STATE BOARD OF
EDUCATION, HARRISON COUNTY BOARD OF
EDUCATION, WEST VIRGINIA SECONDARY
SCHOOL ACTIVITIES COMMISSION, W.
CLAYTON BURCH in his official
capacity as State Superintendent,
and DORA STUTLER in her official
capacity as Harrison County
Superintendent, PATRICK MORRISEY in*

*
*
* Case No.
* 2:21-CV-00316

VIDEOTAPED DEPOSITION OF
JOSHUA SAFER, M.D.
March 24, 2022

Any reproduction of this transcript
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by the certifying agency.

1 his official capacity as Attorney *
2 General, and THE STATE OF WEST *
3 VIRGINIA, *
4 Defendants *

5 * * * * *

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7 VIDEOTAPED DEPOSITION OF
8 JOSHUA SAFER, M.D.
9 March 24, 2022

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VIDEOTAPED DEPOSITION
OF
JOSHUA SAFER, M.D., taken on behalf of the Intervenor
herein, pursuant to the Rules of Civil Procedure, taken
before me, the undersigned, Nicole Montagano, a Court
Reporter and Notary Public in and for the Commonwealth
of Pennsylvania, taken via videoconference, on
Wednesday, March 24, 2022 at 9:30 a.m.

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OBJECTION PAGE

ATTORNEY

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S T I P U L A T I O N

(It is hereby stipulated and agreed by and between
counsel for the respective parties that reading,
signing, sealing, certification and filing are not not
waived.)

P R O C E E D I N G S

MR. BABWAH: My name is Brandon Babwah.
I'm a notary public out of the State of New York.

VIDEOGRAPHER: We are now on the record.
My name is Jacob Stock. I'm a Certified Legal Video
Specialist employed by Sargent's Court Reporting
Services. The date today is March 24th, 2022. The
current time on the video monitor reads 9:17 a.m.
Eastern Standard Time. This deposition is taken
remotely by videoconference. The caption of this case
is the United States District Court for the Southern
District of West Virginia at Charleston, BPJ, et al.
versus West Virginia State of Board of Education, et
al., Civil Action No. 2:21-cv-00316. The name of the
witness is Joshua Safer. Will the attorneys present
state their names and the parties they represent?

1 ATTORNEY BROOKS: Roger Brooks for the
2 Intervenor, Lainey Armistead, in the room --- in the
3 conference room with the witness. With me is my
4 colleague, Lawrence Wilkerson.

5 ATTORNEY HOLCOMB: Christiana Holcomb for
6 the Intervenor.

7 ATTORNEY TRYON: This is David Tryon
8 representing the State of West Virginia. I'm with the
9 Attorney General's Office.

10 ATTORNEY MORGAN: This is Kelly Morgan on
11 behalf of the West Virginia Board of Education and
12 Superintendent Burch.

13 ATTORNEY DENIKER: Good morning. Susan
14 Deniker representing Harrison County Board of Education
15 and Superintendent Dora Stutler.

16 ATTORNEY GREEN: Roberta Green here on
17 behalf of West Virginia Secondary School Activities
18 Commission.

19 ATTORNEY BLOCK: For the Plaintiff in the
20 room is Josh Block from the ACLU.

21 ATTORNEY SWAMINATHAN: And you have Sruti
22 Swaminathan from Lambda Legal.

23 ATTORNEY HARTNETT: Good morning. This
24 is Kathleen Hartnett from Cooley for the Plaintiff.

1 BY ATTORNEY BROOKS:

2 Q. Doctor Safer, good morning. I want to first put
3 in front of you your expert report and your rebuttal
4 report so that you have those if at any point you want
5 to refer to them. It looks --- for convenience let's
6 mark those as Exhibit 1 and 2 for the deposition.

7 ATTORNEY TRYON: Roger, one moment. I'm
8 looking at the realtime, and it's recording you as
9 Attorney Capehart. So I don't know if that needs to be
10 corrected now. And it's showing me as Attorney
11 Hartnett.

12 ATTORNEY BROOKS: She will get that fixed
13 and the record will be correct.

14 ATTORNEY TRYON: Okay.

15

16 (Whereupon, Exhibit 1, Report of Dr. Safer,
17 was marked for identification.)

18 (Whereupon, Exhibit 2, Rebuttal Report of
19 Dr. Safer, was marked for identification.)

20

21 ATTORNEY BROOKS: And at the moment I'm
22 handing copies to the witness. And I would like to mark
23 as Safer Exhibit 3 a short article entitled Fairness for
24 Transgender People in Sport by Joshua Safer.

1 ATTORNEY WILKINSON: Tab 82.

2 ---

3 (Whereupon, Exhibit 3, Fairness for
4 Transgender People in Sports Article, was
5 marked for identification.)

6 ---

7 ATTORNEY BROOKS: And the court reporter
8 will hand the stamped copy to the witness; am I correct?

9 BY ATTORNEY BROOKS:

10 Q. And Doctor Safer, I will ask you questions if
11 you go about your expert reports but let me ask you now
12 to focus your attention on Exhibit Number 3. Am I right
13 that this is an article that you have just very recently
14 published?

15 A. Yes.

16 Q. When did this come out?

17 A. This came out within the past few weeks I think.

18 Q. And this is not a recording of the original
19 research. This is a two page piece simply explaining
20 current issues to the readership of this journal?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: So this is not original
23 research, that's correct.

24 ATTORNEY BROOKS: Thank you.

1 BY ATTORNEY BROOKS:

2 Q. How would you describe the purpose of this
3 article?

4 A. The purpose of this article is to educate
5 endocrinologists, frame the issues and also serves a bit
6 as a charge to endocrinologists in terms of work that
7 needs to be done.

8 Q. Thank you. If you look at the first column of
9 the first page, in the third paragraph you will see it
10 begins a possible tension exists because of the
11 observation that on average cisgender boys and men have
12 better performance outcomes in athletics than do
13 cisgender girls and women. Do you see that language?

14 A. I do.

15 Q. And you are referring there to the general
16 observation that natal males have better average
17 athletic performance than natal females in a variety of
18 measures.

19 Correct?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: So I guess I need to be
22 more specific or I can clarify.

23 BY ATTORNEY BROOKS:

24 Q. If you would be more specific.

1 A. So cisgender men at a certain age have better
2 sports outcomes than cisgender women.

3 Q. But you wrote in this just published article
4 that cisgender boys and men have better performance
5 outcomes than the cisgender girls and women.

6 Correct?

7 A. That is correct.

8 Q. And what did you mean in that statement by your
9 reference to boys and girls?

10 A. Boys and girls who are basically --- it depends,
11 it's context I guess. So boys and girls who are
12 developed to that point.

13 Q. So those --- what you had in mind are boys and
14 girls, once the puberty process begins in males in
15 particular?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: Yes, I guess I would say
18 that what we know is what is towards the end of puberty
19 and subsequent development beyond puberty.

20 BY ATTORNEY BROOKS:

21 Q. You say in the next sentence --- well, let me
22 just clarify, you accept as a scientific fact the
23 general observation that, on average, boys and men,
24 defining boys as you just did, have significantly

1 stronger athletic performance in a variety of metrics
2 than girls and women as you just defined girls; correct?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: So I guess how I would say
5 that is I accept as fact that men and boys who are
6 appropriately developed have, yeah, have bad performance
7 outcomes in certain sports than do cisgender women and
8 cisgender girls again appropriately developed.

9 BY ATTORNEY BROOKS:

10 Q. And the next sentence reads the performance
11 difference has resulted in the establishment of female
12 only divisions for sport participation for girls and
13 women and safely compete in the live events, closed
14 quote. Do you see that language?

15 A. I do.

16 Q. And there you were, am I correct, explaining the
17 relationship of your observation about male performance
18 with the existence in our society of sex-separated
19 sports.

20 Correct?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: So I guess --- I would
23 think the way I would say it myself is this is a ---
24 this is the reason why we have the carve-out for the

1 female category.

2 BY ATTORNEY BROOKS:

3 Q. And one reason is to give cisgender girls and
4 women an opportunity to, quote, reliably win events.

5 Correct?

6 ATTORNEY BLOCK: Objection.

7 COURT REPORTER: I'm sorry, Counsel, I
8 can't hear you.

9 BY ATTORNEY BROOKS:

10 Q. One reason, according to what you've written in
11 this article, that there have been a carve-out in a
12 separate female division is to provide girls and women
13 with opportunities to, quote, reliably win events,
14 closed quote.

15 Correct?

16 A. So I guess the way I would say it is if we are
17 going to be really careful with the language here that
18 it would be on average to reliably win events, that is
19 --- yeah, I will leave it at that.

20 Q. Certainly not every girl and women is going to
21 win events, as I know as a male who never won an event?

22 A. Exactly.

23 Q. And another reason, according to this sentence
24 that you wrote, for having a separate category for girls

1 and women is so that they can, quote, safely compete.

2 Correct?

3 A. The word safely in that context is kind of ---
4 accentuates reliably.

5 Q. And you wrote in the next sentence that, quote,
6 the female-only divisions are a major factor to
7 encourage greater participation of girls and women in
8 sports with a goal of equal participation rates.

9 Do you see that language?

10 A. I do.

11 Q. And can you explain to me what you understand or
12 what you were trying to explain as the relationship
13 between having a separate female category on the one
14 hand and encouraging greater participation by women and
15 girls on the other?

16 A. Some of the goals of the people who are in sport
17 who organize sport are to get as high fractions of the
18 population to participate as can be encouraged to do so
19 for sheer health of those individuals and then of
20 everybody. And so the purpose of the carve-out then in
21 these circumstances is to encourage girls and women to
22 participate in larger numbers than they might otherwise.

23 Q. And do you have an opinion, do you have an
24 expert opinion as to whether the existence of separate

1 categories for female sports has in fact been a, quote,
2 major factor in encouraging greater participation by
3 women and girls in sport?

4 A. I don't have an expert opinion.

5 Q. You don't know whether that is objectively true
6 or not?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: I don't --- right, I can't
9 state as an expert on the details of that subject,
10 that's right.

11 BY ATTORNEY BROOKS:

12 Q. On the second column, in the --- the first full
13 sentence begins many hormone related. Do you see that?

14 A. Yes, I do.

15 Q. Let me read that sentence into the record.
16 Quote, many hormone-related physical characteristics
17 acquired during puberty are not reversed if hormone
18 levels are changed later in life. Can you tell us what
19 physical characteristics associated with typical male
20 development are in your opinion not reversed if hormone
21 levels are changed later in life?

22 A. Again, so I don't know that I would off the top
23 of my head give an exhaustive list but a classic would
24 be height.

1 Q. Would you --- I understand your list may not be
2 exhaustive, but let me ask you to tell us all the
3 examples as you're able to sit here thinking today of
4 physical characteristics acquired during male puberty
5 that are not reversed if hormone levels are changed
6 later in life.

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: I don't know that I could
9 --- I don't know that I would want to accidentally go
10 down that path and conjecture too much, but if I'm
11 expanding a bit on height and thinking about bone
12 characteristics, especially there might be modest change
13 but significant residual bone would be the biggest
14 example. And some other elements --- I can't even say I
15 was about to say a bit proportional, but it's more
16 complicated than that, so other --- other tissues partly
17 influenced by that fact.

18 BY ATTORNEY BROOKS:

19 Q. If we jump down to the next paragraph it begins,
20 quote, the questions arise most with transgender women
21 who began hormone treatment after puberty. And then it
22 continues, quote, the situation includes most
23 transfeminine people because it is most common to
24 undergo endogenous puberty prior to seeking medical

1 interventions appropriate to gender identity. Have I
2 read that correctly?

3 A. Yes.

4 Q. And is it consistent with your experience that
5 most natal males who seek what you refer to as gender
6 confirming treatment do so after experiencing at least
7 most of the ordinary male puberty?

8 ATTORNEY BLOCK: Objection to form.

9 THE WITNESS: Yes. So just terminology,
10 just to be clear, so people who are recorded male at
11 birth who are looking for gender affirming is the term
12 but gender confirming is fine. And sorry, the question
13 there?

14 BY ATTORNEY BROOKS:

15 Q. I will ask it again. Is it consistent with your
16 personal experience that most natal males who seek
17 gender affirming treatment present after undergoing at
18 least most of a natural male puberty?

19 ATTORNEY BLOCK: Same objection to
20 terminology.

21 THE WITNESS: Yes. So most transgender
22 women who come seeking medical treatment have gone
23 through a typical male puberty, that is correct, right
24 now.

1 BY ATTORNEY BROOKS:

2 Q. And in your clinic most of them have gone
3 through what you would consider to be a complete male
4 puberty process?

5 A. I can't answer that completely because we define
6 puberty in this narrow way with the Tanner stages, but
7 then people continue to have development even beyond
8 that to a significant degree.

9 Q. But they have experienced, in your professional
10 experience, at least the bulk of the pubertal changes?

11 A. Yes, I mean the --- I guess --- the way I would
12 say it is, is that most of the transgender women who are
13 coming or even girls who are coming for medical
14 attention have gone through the classic Tanner stages of
15 puberty through Tanner five, which is the last one, by
16 the time they have determined that they're interested in
17 gender-affirming treatment, yes.

18 Q. And let's go back to the very first paragraph of
19 your article in which you mention about five lines down,
20 quote, concern for possible residual athletic advantages
21 from a history of typical male puberty, closed quote.
22 Do you see that language?

23 A. Let me find it. Where is it?

24 Q. It's about five lines down on the very first

1 paragraph of the article.

2 A. Oh, the middle of the sentence, exactly.

3 Q. And so in your opinion, it is concern for
4 possible residual athletic advantages from a history of
5 typical male puberty that drives a great deal of concern
6 about how to address inclusion of natal males who
7 experience a female gender identity in female athletics.

8 Am I correct?

9 ATTORNEY BLOCK: Objection to form.

10 THE WITNESS: So the concern about the
11 residual impact of testosterone during puberty for
12 transgender women who went through a typical male
13 puberty is the source of --- right, is a source of
14 tension at a medical sensitive level, yes.

15 BY ATTORNEY BROOKS:

16 Q. And that's an issue that, for instance, you
17 engage in extensive discussions about in connection with
18 your service on the committee for the IAAF.

19 Am I correct?

20 A. So the --- right, the conversation at World
21 Athletics now, but formerly IAAF, has dealt and I'm sure
22 will continue to deal with that which is the question of
23 to what degree are some of those characteristics, a
24 cause for relevant athletic advantage.

1 Q. And in your opinion, concern about possible
2 residual athletic advantages resulting from a history of
3 typical male puberty is legitimate concern.

4 Right?

5 ATTORNEY BLOCK: Objection to form.

6 THE WITNESS: Right. I don't know that
7 I'm as an expert commenting on its legitimacy. My role
8 on the committee is talking about what is.

9 BY ATTORNEY BROOKS:

10 Q. Do you have any expert opinion as to whether
11 concern for possible residual athletic advantages from a
12 history of typical male puberty is a legitimate concern?

13 A. I'm sorry. Say that again.

14 Q. Do you have any expert opinion as to whether
15 concern for possible residual athletic advantage from a
16 history of a typical male puberty is a legitimate
17 concern?

18 A. I don't know that I would --- again, I don't
19 know that I'm an expert on what is legitimate or not. I
20 come into the room as the scientist talking about what
21 is true and what is not true, what do we know and what
22 do we not know.

23 Q. So on the question then after the science has
24 been put on the table as to how to balance that with

1 other considerations of fairness, of inclusion, that is
2 not your expertise is what you are telling me?

3 A. That is right, that is not my expertise.

4 Q. If we go to page two, in the first column, the
5 second full paragraph begins because testosterone. Do
6 you see that paragraph?

7 A. I do.

8 Q. And you discuss there World Athletic
9 requirements, that is the former IAAF I believe you just
10 testified?

11 A. Yes.

12 Q. And the World Athletics has adopted a
13 requirement to suppress testerone (sic) to five
14 nanomolar per liter testosterone.

15 Correct?

16 A. World Athletics threshold is five nanomolar per
17 liter for those sports where they have a threshold.
18 That's right, yes.

19 Q. And at least formally the International Olympic
20 Committee had a ten nanomolar threshold as part of what
21 you would call out in this paragraph.

22 Is that correct?

23 ATTORNEY BLOCK: Objection to form.

24 THE WITNESS: Yes. So it was the case

1 that the International Olympic Committee Medical Group
2 was trying to form a unified approach just for purposes
3 of organization. And at that time a ten nanomolar per
4 liter suggestion was put out. And that is about as far
5 as it got because it then was shifted to all of the
6 individual international federations.

7 BY ATTORNEY BROOKS:

8 Q. You say in the final sentence of that paragraph,
9 quote, such thresholds are considered to be fair to
10 transgender women because they are well above the 1.7
11 nanomolar per liter target testosterone threshold in
12 medical treatment guidelines, closed quote.

13 Do you see that language?

14 A. Yes.

15 Q. Am I correct that in your professional
16 understanding the 1.7 nanomolar per liter target is set
17 because that's generally believed to be at the upper
18 range of testosterone levels in normal, healthy females?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: So the 1.7 nanomolar per
21 liter target is the upper level for adults cisgender
22 women.

23 BY ATTORNEY BROOKS:

24 Q. And with that clarified, can you explain to me

1 what you meant by the sentence that I just read, what
2 the point is there?

3 A. The point of the sentence is to --- I guess
4 there are a couple of considerations in terms of
5 determining these numbers, but --- so part of the point
6 is to identify numbers that are feasible for transgender
7 women on their medical treatment.

8 Q. Is there some other point to this sentence in
9 your understanding as it is offered?

10 ATTORNEY BLOCK: Objection to form.

11 THE WITNESS: So the sentence references
12 that piece, but there is the additional context of
13 having a number that is fair to the greater female
14 committee cisgender and transgender too.

15 BY ATTORNEY BROOKS:

16 Q. So it's fair in your judgment to transgender
17 women because the threshold that is being set gives,
18 what should we say, plenty of buffer above what is
19 considered to be the upper range of normal female
20 testosterone levels?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: Right. So I'm not taking a
23 position on what is fair to be clear.

24 BY ATTORNEY BROOKS:

1 Q. Thank you.

2 A. But the concept of those in the room making that
3 distinction felt that this cutoff would be fair because
4 there would be, indeed, create some buffer and,
5 therefore, people who weren't perfectly at goal would
6 still be included.

7 Q. So because this may be important, let me
8 clarify, when you wrote such thresholds are considered
9 to be fair, you were not offering a personal opinion
10 about fairness but explaining the judgment that had been
11 made by this committee about fairness?

12 A. That's correct.

13 Q. Thank you. And did it cause you personally any
14 concern that the threshold --- that because the
15 threshold that was set was more than three times higher
16 than the upper bounds of testosterone concentrations in
17 normal healthy women, that that might be unfair to the
18 broader population of cisgender women?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: So to be clear, I'm not
21 rendering an opinion as an expert on what is fair, but I
22 can interpret the considerations of people having these
23 conversations. And so while it is true that the
24 laboratory range for testosterone for healthy cisgender

1 women has an upper limit of 1.7 nanomolar per liter,
2 there are cisgender women who, for a variety of reasons,
3 have numbers higher than that and so that and --- so
4 that is part of the consideration.

5 BY ATTORNEY BROOKS:

6 Q. Let me take you to the two paragraphs below that
7 to the paragraph that begins the societal priorities.
8 Do you see that paragraph?

9 A. I do.

10 Q. The last sentence of that paragraph reads if
11 advantage from testosterone is demonstrated, does
12 society want to implement rules that may indirectly
13 coerce transgender children to begin medical regimens
14 prior to their being ready and that they might never
15 actually choose otherwise, closed quote.

16 Do you see that language?

17 A. I do.

18 Q. Would you explain to me the concern that you are
19 expressing there?

20 A. If a societal goal --- and again here recognize
21 I'm not acting as an expert in this space, but I'm
22 trying to explain to my colleagues what people are
23 discussing. And if our concern is increased
24 participation in sport by various people, then you can

1 envision a circumstance where some girls farther along
2 in puberty have a testosterone advantage that could be
3 demonstrated. Again, not that we even have at this
4 point. And then we would be faced with that question,
5 which is that competing goal of making those transgender
6 girls participate in sports and a recognition if they
7 are sufficiently far along in their development that
8 they may have an advantage if we demonstrate such an
9 advantage.

10 Q. Let me see if I can break that out. Were you
11 talking here about a concern about a hypothetical rule
12 that says to a natal male who identifies as female that
13 you may play if you have suppressed testosterone --- you
14 may play if you have taken puberty blockers at an early
15 age but you may not play if you have not taken puberty
16 blockers from an early stage? Is that the hypothetical
17 structure that you were addressing in this sentence?

18 ATTORNEY BLOCK: Objection to form.

19 THE WITNESS: So the --- it is a
20 hypothetical and it would be that if we make a specific
21 testosterone lowering rule at a scholastic level, might
22 we run into a circumstance where we are encouraging
23 somebody to make medication who might not otherwise take
24 that medication.

1 BY ATTORNEY BROOKS:

2 Q. And staying away from questions of fairness and
3 speaking from what I think is a medical ethics
4 perspective, would you think it raises ethical problems
5 if society were to adopt a rule that permitted certain
6 individuals to compete in female athletics if they had
7 taken puberty blockers but did not permit them to
8 compete with the athletic if they had not taken puberty
9 blockers?

10 ATTORNEY BLOCK: Objection to form.

11 THE WITNESS: I think that's beyond where
12 I'm commenting as an expert witness. Some of that
13 decision is a society decision or for other experts.

14 BY ATTORNEY BROOKS:

15 Q. Do you consider yourself to have some expertise
16 on medical ethics?

17 A. Not as an expert.

18 Q. And you don't feel able --- you don't have any
19 opinion as you sit here today as to whether a policy
20 that created incentives for children to begin medical
21 regimes relating to gender transition could raise
22 medical ethical concerns?

23 A. Not as a medical expert, that's right.

24 Q. In the next paragraph --- and I think we said

1 this is just out in the last couple of weeks, this
2 publication.

3 Right?

4 A. It's very fresh. Number five, so yes.

5 Q. I'm not playing memory games. It says at the
6 top advance access publication 17 March 2022?

7 A. Good.

8 Q. So very recent?

9 A. Yes.

10 Q. And you believe you are reasonably current in
11 the science of this area?

12 A. I am reasonably current, indeed.

13 Q. I didn't ask if you know it all because nobody
14 knows it all, but you say at the beginning of this
15 paragraph much remains unknown scientifically. And you
16 continue, quote, for example, at what point in puberty
17 is advantage from testosterone significant. Is there a
18 point where such advantage would outweigh a priority to
19 outweigh all participants --- all to participate in
20 sport of some sort, closed quote.

21 Do you see that language?

22 A. I do.

23 Q. And actually the point in writing the second
24 sentence there --- strike that.

1 Let me just ask this in general. Do you have
2 an opinion as to how much of a performance advantage
3 would count for those --- for natal males versus natal
4 females, how much of a performance advantage would be,
5 quote, significant?

6 ATTORNEY BLOCK: Objection to form.

7 THE WITNESS: I do not have an opinion.

8 BY ATTORNEY BROOKS:

9 Q. And in your view, is that even a scientific
10 question?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: Let me think. No, that
13 isn't a scientific question.

14 BY ATTORNEY BROOKS:

15 Q. And you --- and the next sentence is there a
16 point where an advantage, such an advantage would
17 outweigh a priority to motivate all to participate. Am
18 I correct that you also don't consider that to be a
19 scientific question?

20 A. That is correct.

21 Q. That is a value judgment?

22 ATTORNEY BLOCK: Objection to form.

23 THE WITNESS: So it's not a scientific
24 question. I can go a little more in --- I can expand a

1 little bit there which is to say that we have various
2 advantages and degrees of unfairness. So what could be
3 a scientific question, if we knew the answers, would
4 include the degree of advantage for some circumstance
5 versus another circumstance where we are able to measure
6 those things.

7 BY ATTORNEY BROOKS:

8 Q. But the question of whether an advantage on the
9 one hand outweighs a desire to be inclusive on the other
10 hand is a value question, not a scientific question?

11 ATTORNEY BLOCK: Objection to form.

12 BY ATTORNEY BROOKS:

13 Q. In your opinion.

14 ATTORNEY BLOCK: Objection to form.

15 THE WITNESS: So I guess I would just go
16 back to saying how I said it, which is the scientific
17 question in there would be to provide that degree of
18 difference and show, for example, that this would be ---
19 this is small advantages versus someone that we are
20 already do in society as big advantage and that would be
21 how --- that would be the role of the scientist.

22 BY ATTORNEY BROOKS:

23 Q. I understand that's what you would like to say,
24 but my question for you is, in your opinion, is the next

1 step of deciding of whether that advantage which has now
2 been scientifically detailed outweighs a priority to
3 motivate all to participate is a value decision.

4 ATTORNEY BLOCK: Objection to form.

5 THE WITNESS: Yeah, I don't --- I guess I
6 can't as an expert say for certain that in all
7 circumstances that is a value to consider.

8 BY ATTORNEY BROOKS:

9 Q. You continue among your lists of things that
10 are, quote, unknown scientifically, quote, for those who
11 have completed puberty, what duration of
12 testosterone-lowering treatment is sufficient to create
13 a level playing field in a given sport, closed quote.

14 Do you see that?

15 A. Yes.

16 Q. And in your view, the question of what duration
17 of testosterone lowering treatment, if any, can be
18 sufficient to create a level playing field in a given
19 sport is currently unknown scientifically?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: It's unknown scientifically
22 across virtually all sports. What duration of
23 testosterone lowering raises what degree of advantage.
24 It's just at that level. To go to the level playing

1 field is a whole further tier.

2 BY ATTORNEY BROOKS:

3 Q. And in your final paragraph I think you said at
4 the beginning that, in part, this was a call to the
5 field of endocrinology for needed research. In the
6 final paragraph you say, quote, we in the endocrine
7 healthcare community have much work to do to create an
8 evidence base to help guide decision makers so the
9 choices for transgender women in sport are data driven,
10 closed quote.

11 Have I read that language correctly?

12 A. Yes.

13 Q. So it's your view as of 2002 that the data that
14 we have available today are insufficient to enable data
15 driven choices about transgender participation in female
16 athletics.

17 Correct?

18 ATTORNEY BLOCK: Objection to form.

19 THE WITNESS: I would say that in 2022 we
20 have insufficient data to --- how would I say this, we
21 have insufficient data to make rules for, let's say,
22 transgender women, mostly talking about older more
23 developed people, that would address these concerns for
24 participation.

1 BY ATTORNEY BROOKS:

2 Q. Let me ask you to find your initial expert
3 report, which is Exhibit-1, and there I will ask you to
4 turn to paragraph 58. At the beginning of paragraph 58
5 you wrote in this report executed on January 21, 2022,
6 which is two months prior to the publication date of the
7 article we just looked at --- and actually, let me pause
8 and ask you, when did you write the article that we just
9 looked at? And the process always grinds on for a
10 little while. When do you think you substantially
11 completed the task?

12 A. I honestly don't remember.

13 Q. Sorry. The question was when do you think you
14 substantially wrote the text in the article that you
15 just looked at?

16 A. I honestly don't remember the details. We can
17 talk in years, so it would be 2022 and back into 2021.

18 Q. Okay.

19 So about the same time that you were preparing
20 this expert report?

21 A. There certainly would be some overlap.

22 Q. You wrote in paragraph 58, quote, even if
23 evidence were eventually to show that on average
24 transgender women have some level of advantage compared

1 to average non-transgender women, closed quote.

2 Do you see that language?

3 A. I do.

4 Q. Now, in fact, you are aware of substantial
5 evidence that, on average, transgender women do have
6 some level of advantage compared to advantage
7 non-transgender women.

8 Correct?

9 ATTORNEY BLOCK: Objection to form.

10 THE WITNESS: No, I'm not. So that isn't
11 my statement.

12 BY ATTORNEY BROOKS:

13 Q. And is the question --- so you served on the
14 IAAF Committee discussing questions of testosterone
15 levels. And in that context you did not become
16 acquainted with data showing that on average transgender
17 women have some level of advantage compared to average
18 non-transgender women?

19 A. Not in --- so, no. In the context of specific
20 sports, no.

21 Q. Do you consider the question of how much
22 advantage natal males have over natal females in
23 particular sports to be within your professional
24 expertise?

1 ATTORNEY BLOCK: Objection to form.

2 THE WITNESS: So sorry --- so cisgender
3 men versus cisgender women, that difference at an adult
4 level, is at my expertise to know that degree of
5 difference? Is that the question?

6 BY ATTORNEY BROOKS:

7 Q. It is.

8 A. No, that is not my expertise.

9 Q. And is it within your expertise to know the
10 level of advantage enjoyed by natal males who have
11 transitioned to female gender identity over cisgender
12 women in any particular sport?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: So in the --- so if we are
15 talking cisgender women versus transgender women, it
16 would be in my expertise to know what data we have on
17 this subject, which is different from knowing the degree
18 of difference because we don't have those data.

19 BY ATTORNEY BROOKS:

20 Q. You say in paragraph 60, let me find this,
21 quote, there is no inherent reason why transgender women
22 physiological characteristics related to athletic
23 performance should be treated as any more of an unfair
24 advantage than the advantages that already exist among

1 different women athletes. Do you see that language?

2 A. I do.

3 Q. Now, earlier you told me rather emphatically
4 that the question of fairness is outside your
5 professional expertise.

6 Correct?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: It is outside my expertise.

9 BY ATTORNEY BROOKS:

10 Q. So why did you offer here an opinion about what
11 is fair or unfair?

12 ATTORNEY BLOCK: Objection to form.

13 THE WITNESS: Right. So I'm not
14 determining the fairness per se as an expert, but I'm
15 simply talking about the inputs where somebody who is
16 determining what is fair --- where somebody is
17 determining what is fair would consider.

18 ATTORNEY BROOKS: Let me mark as Safer
19 Exhibit 4 an article by Professor Handelsman entitled
20 Circulating Testosterone on a Hormonal Basis of Sex
21 Differences in Athletic Performance.

22 ---

23 (Whereupon, Exhibit 4, Professor Handelsman
24 Article, was marked for identification.)

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ATTORNEY WILKINSON: Tab 18.

VIDEOGRAPHER: I'm sorry, what tab is it?

ATTORNEY BROOKS: Tab 18.

BY ATTORNEY BROOKS:

Q. And Doctor Safer, am I correct this is an article that you read with some care?

A. This is an article that I read with some care.

Q. You cited in your expert report.

Correct?

A. I think so.

Q. I think so, too. It's not a memory test. I retract the question. We will come to it shortly.

Let me ask you to turn in --- and let me ask you, do you know Professor Handelsman personally?

A. I do not.

Q. Have you encountered him in any other actions?

A. I have.

Q. Once, more than once?

A. That is also a trick question for me. For sure once.

Q. Okay.

Do you consider him to have a high reputation in the field?

1 A. If that question is as an expert I can't --- I
2 won't comment, but he certainly has published widely and
3 we quote him.

4 Q. What do you mean by we in that answer?

5 A. The rest of us in the field and I certainly
6 quote him in an expert opinion.

7 Q. All right.

8 And this article in particular we note you
9 widely reference?

10 A. This article is --- yeah, I think that is
11 actually a fair thing to say. It is as widely
12 referenced as anything in a relatively small field.

13 Q. Let me ask you to turn to the second page of
14 this article where Professor Handelsman in the first
15 full paragraph --- the second full paragraph begins
16 nevertheless. He says, quote, fairness is an elusive
17 subjective concept with malleable boundaries that may
18 change over time as social concepts of fairness evolve.

19 Do you see that?

20 A. I do.

21 Q. Do you agree with that statement?

22 A. As an expert I can't comment.

23 Q. You don't purport to be able to give any
24 definition of fairness?

1 ATTORNEY BLOCK: Objection to form.

2 THE WITNESS: Yes, not as an expert.

3 BY ATTORNEY BROOKS:

4 Q. And you don't have any opinion as to whether
5 standards of fairness can change over time?

6 ATTORNEY BLOCK: Objection to form.

7 THE WITNESS: I'm aware of the
8 conversation on the subject, of course, but if you are
9 asking me to comment as an expert, then no.

10 BY ATTORNEY BROOKS:

11 Q. If the actual evidence shows that the actual
12 scientific data were to show that, quote, on average
13 transgender women have, closed quote, a very large
14 advantage compared to average non-transgender women,
15 would you then have any view as to whether permitting
16 non-transgender women to compete in female categories is
17 fair?

18 ATTORNEY BLOCK: Objection to form. I'm
19 sorry, what's the quotation?

20 BY ATTORNEY BROOKS:

21 Q. If actual data were to show that on average
22 transgender women have a very large advantage compared
23 to non-transgender women, then would you have any
24 opinion as to whether it is fair to permit the

1 transgender women to compete in the female category?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: No, that would not change.

4 I would simply as an expert I would talk about those
5 degrees of difference as information.

6 BY ATTORNEY BROOKS:

7 Q. But you would offer no opinion as to whether
8 permitting the participation in the female category was
9 or was not appropriate?

10 A. I would not offer an expert opinion. That's
11 right.

12 Q. Now, you say in paragraph 60 of your expert
13 record that there is, quote, no inherent why transgender
14 women's physiological characteristics related to
15 athletic performance should be treated as any more of an
16 unfair advantage than the advantages that already exist
17 among different women athletes, close quote. We have
18 looked at that language.

19 Correct?

20 A. You are reading that correctly.

21 Q. Thank you.

22 A. Whatever the question is.

23 Q. No question beyond that so far. And your point
24 I take it is that for any given sport some women just

1 have substantially more favorable physiques than others?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: Right. So for any given
4 sport some women have advantages relatively to others,
5 yes.

6 BY ATTORNEY BROOKS:

7 Q. And in basketball some are simply genetically
8 going to be substantially taller than others?

9 A. In basketball some are taller than others, yes.

10 Q. I'm not speaking for you, I, at 5'8", in my
11 shoes for instance was --- am just physiologically
12 disadvantaged for basketball compared to a man who is
13 6'10"?

14 ATTORNEY BLOCK: Objection to form.

15 THE WITNESS: So as an expert I actually
16 wouldn't go there because there are other
17 characteristics in basketball per se.

18 BY ATTORNEY BROOKS:

19 Q. That's true, although I have none of them. But
20 is it, in your view, equally true that there is no
21 inherent reason why cisgender men's physiological
22 characteristics related to athletic performance should
23 be treated as any more of an unfair advantage for
24 competing in the women's category than the advantages

1 that already exist among different women athletes?

2 A. So yeah, let's go through this more slowly a
3 second so I'm clear.

4 Q. All I did was substitute cisgender men for
5 transgender women in that sentence. And my question is
6 doesn't your argument as stated there apply exactly with
7 equal force to cisgender male?

8 A. No.

9 Q. Why is that?

10 A. When we talk about --- when we're talking about
11 a range of characteristics among a range of people
12 versus something that might be systematically true or
13 not and so it just --- so the answer just ends up being
14 more complex.

15 Q. Well, you have testified that most natal women
16 --- pardon me, you testified that most natal males with
17 female gender identity have undergone at least the
18 majority of male puberty before they present for gender
19 affirming treatment.

20 Correct?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: So most cisgender women
23 when they come to medical attention have gone through a
24 significant puberty, the five Tanner stages.

1 BY ATTORNEY BROOKS:

2 Q. And just to clarify, to use your terms, in
3 giving that answer you said cisgender women. That is
4 not what you meant.

5 Correct?

6 A. That is not what I meant, thank you.
7 Transgender women.

8 Q. And therefore, they systematically have gone
9 through --- systematically gone through physiologic
10 changes associated with male puberty?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: So the --- so they --- they
13 have gone through male puberty. And there is something
14 on average that may be true there, but whether that
15 relates to an advantage in a specific sport I can't go
16 there.

17 BY ATTORNEY BROOKS:

18 Q. Well, the example that you gave earlier of a
19 systematic difference resulting from male puberty that
20 these transgender women enjoy is height, that is you
21 mentioned that earlier.

22 Correct?

23 A. Uh-huh (yes).

24 Q. So again, let me ask, given that according to

1 your testimony and experience the substantial majority
2 of transgender women have undergone most of male
3 puberty, why is it not equally true that there is no
4 inherent reason why cisgender men's physiological
5 characteristics related to athletic performance should
6 be treated as any more of an unfair advantages than the
7 advantages that already exist among different women
8 athletes?

9 A. So if I'm following this correctly then it's ---
10 then the answer to the question why are cisgender men
11 different than transgender women?

12 Q. Why does this logic apply differently to the
13 cisgender men than to the transgender women?

14 A. So let's see. It actually doesn't. So if you
15 have a sport where that --- where the advantage or ---
16 for the --- where a known advantage for cisgender men
17 versus cisgender women was sufficiently modest, and
18 again, I wouldn't be the judge of that, but you could
19 envision that becoming a coed sport.

20 Q. Are you offering an opinion that either
21 government or leagues have an obligation to do an
22 individual by individual assessment as to whether a
23 particular natal male who experiences a female gender
24 identity does or does not enjoy a physiological

1 advantage in the sport they wish to play in as a result
2 of typical male development that they had gone through?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: Right, I'm not offering an
5 opinion. It was a long question.

6 BY ATTORNEY BROOKS:

7 Q. Would you like to hear the question back?

8 A. Sure, but I'm not offering an opinion on several
9 aspects.

10 ATTORNEY BROOKS: Would you read that
11 question back, please?

12 ---

13 (COURT REPORTER READS BACK PREVIOUS QUESTION.)

14 ---

15 BY ATTORNEY BROOKS:

16 Q. And your answer is?

17 A. So I'm not offering an opinion. I should expand
18 a bit because how that question was phrased as an
19 individual by individual person and most of these rules
20 are across a group of sports.

21 Q. And my question was about an individual person.

22 A. Your question was an individual person, but ---.

23 Q. Right. Looking at your paragraph 60, again, do
24 you believe there is --- are you offering an opinion ---

1 let me start that again. Are you able to identify for
2 me any inherent reason why a relatively weak or small or
3 slow male --- strike that.

4 You referenced in your report and also the
5 article we just looked at the IAAF regulations that
6 excluded from the female category any individual who has
7 circulating testosterone higher than five nanomolar per
8 liter. Do you recall that?

9 ATTORNEY BLOCK: Objection to form.

10 THE WITNESS: So just to clarify, it is
11 not --- that rule for five nanomolars is not across all
12 sports.

13 BY ATTORNEY BROOKS:

14 Q. And which sports in your recollection did that
15 apply to?

16 A. Yeah, that's --- I don't remember off the top of
17 my head.

18 Q. At the very least it applied to track events.
19 Correct?

20 A. It does. But if you start to quiz me on the
21 specific distances, I won't get that.

22 Q. And nor will I so quiz you. And that
23 requirement as applied to track competition was, in
24 fact, the subject of a major international arbitration,

1 as you're aware.

2 Correct?

3 A. If we're referencing the Caster Semenya case,
4 yes.

5 Q. Did you yourself have any participation in that
6 arbitration?

7 A. I did not.

8 Q. Do you know whether Doctor Handelsman had any
9 participation in that?

10 ATTORNEY BLOCK: Objection.

11 THE WITNESS: I don't know off the top
12 off of my head.

13 BY ATTORNEY BROOKS:

14 Q. Have you ever read the arbitrarial decision in
15 that case?

16 A. I'm certain I read excerpts, but that is as much
17 as I could say.

18 Q. Okay.

19 You participated in developing on the --- a
20 member of the committee that developed the regulation
21 that you've referenced, the 7.5 nanomolar threshold?

22 A. I was on the committee that helped determine
23 that particular threshold conceptual, yes.

24 Q. And you're aware that in addition to individuals

1 such as Caster Semenya, who suffered of a disorder of
2 sexual development, that that rule would exclude some
3 transgender women from female athletics that were
4 subject to that IAAF rule.

5 Correct?

6 ATTORNEY BLOCK: Objection to the
7 terminology.

8 THE WITNESS: So I was aware that by
9 setting a threshold that there --- and even that
10 threshold in particular, that there would be transgender
11 women who would not achieve that threshold for whatever
12 reason.

13 BY ATTORNEY BROOKS:

14 Q. And did you nevertheless consider the regulation
15 to be reasonable?

16 A. If you are asking me as an expert, then again I
17 can't comment.

18 Q. Well, let me just ask you as Doctor Safer.

19 A. Am I allowed to ---?

20 ATTORNEY BLOCK: Objection to form.

21 BY ATTORNEY BROOKS:

22 Q. You are allowed.

23 A. Okay. So having a rule does make sense to me,
24 yes.

1 Q. And you thought that that rule was reasonable?

2 A. As with the data we have currently, yes,
3 personally.

4 Q. And what, in your opinion, is the inherent
5 reason that advantages conferred by testosterone levels
6 far outside the normal female range should be treated as
7 any more of an unfair advantage than the advantages that
8 already exist among different women athletes?

9 ATTORNEY BLOCK: Objection. I'm sorry.
10 Can you clarify as an expert or as an individual just
11 because you shifted back and forth?

12 BY ATTORNEY BROOKS:

13 Q. First as an expert.

14 A. So yes --- give me the question again. I'm
15 sorry.

16 Q. What, in your opinion, is the inherent reason
17 that advantages conferred by testosterone levels outside
18 the normal female range should be treated as any more of
19 an unfair advantage than the advantages that already
20 exist among different women athletes?

21 A. So to clarify we --- so, okay, let me go back.
22 Let me answer in pieces I guess or ask you to say it in
23 pieces. So what is different between typical male
24 levels of testosterone in an individual and some other

1 characteristics that are across the range of
2 characteristics of cisgender women? Is that the
3 question? Am I rephrasing that correctly?

4 Q. I'm actually referencing paragraph 60 of your
5 expert report, but my question --- and let's take for
6 instance, a natal male who has press testosterone but
7 only achieved six nanomolar per liter concentration, do
8 you have that concentration, do you have that in mind?

9 A. A transgender woman whose testosterone level is
10 six.

11 Q. Right. What in your opinion is the inherent
12 reason that advantages conferred by testosterone levels
13 above a threshold such as five nanomolars should be
14 treated as any more of an unfair advantage than the
15 advantages that already exist among different women
16 athletes?

17 ATTORNEY BLOCK: Objection to form.

18 THE WITNESS: So a couple of things.
19 First of all, I don't know that a testosterone level of
20 six is from a scientific perspective demonstratively
21 different than a testosterone level of five. It's just
22 a matter of affecting it overall. So I want to clarify
23 that. It's not that --- that that small degree is
24 necessarily relevant. And I can't even say that we

1 demonstrated advantage. It's still a theoretical with
2 regard to some of those higher testosterone levels. Let
3 me think about those for a second. Yes, so some of the
4 logic pattern for having a threshold is in order to be
5 able to limit the entire conversation to dealing with
6 transgender women or women with --- or intersex women or
7 women who for any reason have have elevated testosterone
8 levels and not to open the door at the elite level for a
9 participation by cisgender men posing as cisgender women
10 if that makes sense.

11 BY ATTORNEY BROOKS:

12 Q. Is there, in your judgment, any inherent reason
13 that advantages conferred by testosterone levels well
14 outside normal female ranges should be treated as any
15 more of an unfair advantage than the advantages that
16 already exist among different women athletes?

17 A. So I have to go back to that one. Is it my
18 opinion that male level testosterone levels ---?

19 Q. Let me --- my question is testosterone levels
20 significantly above normal female ranges?

21 A. Are --- then no, sorry. It took me a little
22 while to get there, but no.

23 Q. Because the question was complicated and the
24 answer was broken up I will ask you again, not to insult

1 you but so we have a clear record. I think I understood
2 your answer but is there, in your opinion, any reason
3 why advantages provided by testosterone level well
4 outside normal female ranges should be treated as any
5 more of an unfair advantage than the advantages that
6 already exist among different women athletes?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: And as an expert I'm not
9 rendering an opinion there, that's right.

10 BY ATTORNEY BROOKS:

11 Q. Okay.

12 In paragraph 55 of your ---.

13 ATTORNEY BLOCK: Would now be a good time
14 for a break?

15 ATTORNEY BROOKS: Let me just ask this
16 one question and then yes.

17 BY ATTORNEY BROOKS:

18 Q. In paragraph 55 you cite a 2015 article by
19 Joanna Harper?

20 A. I do, yes.

21 Q. Have you ever met Joanna Harper?

22 A. I have.

23 Q. And have you collaborated with Joanna Harper in
24 any way?

1 ATTORNEY BLOCK: Objection to the form.

2 THE WITNESS: Yeah, I don't, but I guess
3 --- it's a complicated answer, so I need to know what
4 you mean by that.

5 BY ATTORNEY BROOKS:

6 Q. I mean it broadly. Have you worked with her on
7 any sorts of projects or committees?

8 A. Well, we were both in the working group for
9 World Athletics that helped develop this threshold.

10 Q. And do you consider Doctor Harper to be
11 knowledgeable in the field of sports physiology?

12 A. I do.

13 Q. And do you consider Doctor Harper to be
14 knowledgeable with regard to the impact of testosterone
15 suppression on athletic capabilities in male?

16 A. So do I consider her to be knowledgeable in the
17 field? I certainly do. For what it's worth, she is
18 still Ms. Harper. She's actually in the Ph.D. program
19 now.

20 Q. Oh, okay. I just gave her an honorary degree.

21 A. She occupies a prominent place in the field.

22 ATTORNEY BROOKS: Let's take that break.

23 VIDEOGRAPHER: Going off the record. The
24 current time is 10:25 a.m. Eastern Standard Time.

1 OFF VIDEOTAPE

2 ---

3 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

4 ---

5 ON VIDEOTAPE

6 VIDEOGRAPHER: We are back on the record.

7 Current time reads 10:39 a.m. Eastern Standard Time.

8 BY ATTORNEY BROOKS:

9 Q. Dr. Safer, let me ask you to go back to Exhibit
10 4 Professor Handelsman's article. And if you would turn
11 in that article to page 805, the first paragraph begins
12 the strongest classification in a league sport is that
13 after puberty men 20 times more testosterone than women.

14 Do you see that language?

15 A. I do.

16 Q. And he discusses a number of results and ends
17 his paragraph by saying in concert --- quote, in concert
18 these render women on average unable to compete
19 effectively against men in power based or endurance
20 based sports.

21 Do you see that?

22 A. I do.

23 Q. And do you consider yourself qualified to
24 evaluate Professor Handelman's assertion that women are

1 on average unable to compete effectively against men in
2 power based or endurance based sports?

3 A. No.

4 Q. Not qualified?

5 A. Not qualified, correct.

6 Q. Do you believe you have an understanding ---
7 well, let me ask you this. Do you consider yourself
8 qualified to offer any opinion as to why sports have
9 been separated by sex historically?

10 A. I guess I would say I'm aware of the history.

11 Q. And in your understanding what is the reason
12 that sports have been separated by sex historically?

13 A. The history is that at a certain point where
14 sufficient development has taken place there is a
15 differential in at least some sports between men and
16 women --- between cisgender men and cisgender women such
17 that in order for women to win those events reliably
18 there needs to be a carve-out.

19 Q. And as you sit here today can you identify for
20 me any sport in which you believe that cisgender men
21 after puberty do not enjoy a significant performance
22 advantage over cisgender women?

23 A. Yes.

24 Q. Please do.

1 identification.)

2 ---

3 BY ATTORNEY BROOKS:

4 Q. And Doctor Safer, now that you have --- I asked
5 you earlier about whether you had seen the arbitration
6 decision and I think you said you might have read
7 excerpts of it. Looking at it today, do you believe
8 that you have ever seen a copy of the whole Decision?

9 A. I do not think I've read through the whole
10 Decision.

11 Q. Do you think you've ever held this whole
12 document in your hand before?

13 A. This is the first time that I held the whole
14 document.

15 Q. I'm going to ask you about a few quotations in
16 it, not to ask your opinions about the judgment but to
17 elicit your opinions about the science. So if you would
18 turn --- and the structure of the document is that
19 everything in it has a paragraph number which, thank
20 goodness, makes it easy to find things. So if you would
21 turn to paragraph 556. The first sentence of
22 paragraph 556 of this Decision reads there is no dispute
23 that ensuring fair competition in the female category of
24 elite competitive athletics is a legitimate objective

1 for the IAAF to pursue, closed quote. As a member of
2 the IAAF Committee that established the policy that was
3 challenged in this arbitration, do you agree or disagree
4 that there is no dispute that ensuring fair competition
5 in the female category is a legitimate objective for the
6 IAAF to pursue?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: As an expert I do not have
9 an opinion.

10 BY ATTORNEY BROOKS:

11 Q. Okay.

12 Let me ask you to turn to paragraph 456. And
13 this arbitration, as you noted, deals with the case of
14 Caster Semenya and therefore with track events, not with
15 riflery or with equestrian events. So I will ask your
16 reaction to that context. In the middle of
17 paragraph 456, beginning halfway through the sixth line
18 the panel wrote, quote, suffice to say that post puberty
19 generally speaking males outperform female athletes ---
20 I'm sorry, male athletes outperform female athletes at
21 an elite level. This difference is insurmountable,
22 closed quote.

23 Do you see that?

24 A. I do.

1 Q. And do you believe it to be true, false or
2 outside of your expertise that male athletes outperform
3 female athletes at the elite level at a difference that
4 is insurmountable?

5 ATTORNEY BLOCK: Objection to form.

6 THE WITNESS: As a blanket statement, no,
7 I would say that is not my expertise.

8 BY ATTORNEY BROOKS:

9 Q. Let me ask you to turn to 576. I said 576. I
10 meant 577. I apologize. At the end of 577 the panel
11 has written, quote, ---.

12 ATTORNEY BROOKS: We just had static
13 here, so let me ask whether people outside the
14 conference room are hearing us? If somebody could
15 unmute.

16 ATTORNEY TRYON: I can hear you.

17 ATTORNEY BROOKS: We just had some static
18 that caused me concern.

19 BY ATTORNEY BROOKS:

20 Q. At the end of paragraph 577 the panel wrote,
21 quote, male athletes do not have to be elite to surpass
22 even the very best female athletes. Dr. Berman pointed
23 out that in a race such as the 800 meter, a 1.6 percent
24 advantage, as calculated in BG17, was sufficient to

1 determine first place by the region of nine meters,
2 closed quote.

3 Do you see that language?

4 A. Yes.

5 Q. And do you consider it to be true, false or
6 outside your expertise that male athletes do not even
7 have to be elite to surpass the very best female
8 athletes?

9 ATTORNEY BLOCK: Objection to form.

10 THE WITNESS: In a --- as a blanket
11 statement it is outside my expertise.

12 BY ATTORNEY BROOKS:

13 Q. And do you have an opinion as to whether a
14 1.6 percent advantage is a significant advantage or
15 insignificant advantage?

16 A. I think that's too complicated as phrased for me
17 to answer.

18 Q. That's actually one of the simpler questions
19 that I've asked today. Let me ask it again and ask you
20 to think. Do you have an opinion, and if you --- one
21 answer of course is I don't have an opinion or it is
22 outside of my expertise, but do you have an opinion as
23 to whether a 1.6 percent advantage in a track event is a
24 significant advantage?

1 ATTORNEY BLOCK: Objection to form.

2 THE WITNESS: So it depends on the event.

3 BY ATTORNEY BROOKS:

4 Q. Why does it depend on the event?

5 A. Well, there are events where we see --- as an
6 elite Olympic event where the runners are virtually
7 tied. And 1.6 percent then will be significant in the
8 moment because that will be described in that field.
9 And yet there are other events where people are far more
10 spread out and there's greater --- in every element,
11 then 1.6 percent advantage becomes lost in that noise.

12 Q. And --- well, let's take competitive high school
13 athletics, competitive high school track. Do you have
14 an opinion as to 1.6 percent advantage in that context
15 is significant or insignificant?

16 A. I do not have an opinion.

17 Q. So if I understand correctly, your point in some
18 context you know that 1.6 percent is significant but
19 that in other context you don't know one way or the
20 other?

21 ATTORNEY BLOCK: Objection to the form.

22 THE WITNESS: Yes, I guess I would say
23 that in some context I can see that 1.6 percent is
24 significant and then in other context I can see that 1.6

1 percent does not appear to be significant. And actually
2 even if you're asking as an expert, what even is
3 significant is outside my purview, but with that
4 understood I can still see that someone would say it one
5 way and not say it the other way.

6 BY ATTORNEY BROOKS:

7 Q. Let me ask you to turn to paragraph 357. And
8 first I will ask you to turn to page 88, paragraph 351,
9 just so you can see we're in a section summarizing the
10 testimony of Professor David Handelsman. That begins at
11 paragraph 351. And then I'm going to call your
12 attention to paragraph 357 and it puts you to the
13 statement there.

14 357 includes a number of bullet points. The
15 third bullet point, which is on page 91, reads --- and
16 again this is --- the paragraph begins, quote, Professor
17 Handelsman went on to explain in greater detail why the
18 sex difference in circulating testosterone is the cause
19 of the difference in athletic performance between men
20 and women, and then there are bullet points. The third
21 bullet point reads, on average, women have 50 to
22 60 percent of men's upper arm muscle cross-sectional
23 area, 65 to 70 percent of men's thigh muscle
24 cross-sectional area, 50 to 60 percent of men's limb

1 strength and 60 to 80 of men's leg strength. Do you see
2 that language?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: I do.

5 BY ATTORNEY BROOKS:

6 Q. Do you have any knowledge as to whether those
7 statistics are on correct as given by Dr. Handelsman?

8 A. I do not.

9 Q. And do you have any expert knowledge as to how
10 those statistics do or do not change under the influence
11 of testosterone suppression in natal males who
12 experience a female gender identity?

13 ATTORNEY BLOCK: Objection to
14 terminology.

15 THE WITNESS: So I guess the --- I have
16 no expert knowledge about these numbers, per se, but I
17 do know as an expert that when testosterone levels are
18 suppressed in transgender women and actually in
19 cisgender men, anyone, that these numbers are decreased.
20 And I can say that with confidence as an expert.

21 BY ATTORNEY BROOKS:

22 Q. But you're not able to quantify that decrease.
23 Is that correct?

24 A. I cannot quantify that decrease. The data gets

1 murky when we start to get there.

2 Q. Have you ever met Professor Coleman at Duke
3 University?

4 A. Doriane Coleman?

5 Q. Yes.

6 A. I have.

7 Q. And in what context have you interacted with
8 Professor Coleman?

9 A. The --- a professional context.

10 Q. Can you describe the context?

11 A. We have served on some of these --- two of the
12 same committees --- committee task force, whatever you
13 call it, for World Athletics together.

14 Q. Was she, in fact, on the committee which you
15 participated that set the five nanomolar standard for
16 the IAAF?

17 A. I don't recall for sure but I think not.

18 Q. Then can you identify for me the two committees
19 that you recall that you did sit on with Professor
20 Coleman?

21 A. Subsequent to the initial group, and I don't
22 know that it's two committees, it may be the same
23 committee, they get renamed. Things like that happen.
24 So it is --- I'm thinking forward to assisting other

1 international federations with their rule making.

2 Q. And do you consider Professor Coleman to be
3 knowledgeable about the relative athletic capabilities
4 and records of male and female athletes?

5 A. To me that's too vague a question. She's a
6 lawyer.

7 Q. Are you aware also of her athletic background as
8 a competitive athlete?

9 A. I am.

10 Q. And are you aware of her research and
11 publications having to do with athletic records and
12 capabilities of male and female athletes?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: I'm aware of some of her
15 publications where she has co-authored, but she's not
16 usually the physiology expert in the group.

17 BY ATTORNEY BROOKS:

18 Q. Let me ask you to turn to paragraph 393. And if
19 you look at the page you will see that this is within
20 the tribunal summary of testimony of Professor Coleman.
21 Let me ask you since you dealt personally with the
22 professor, because I want the record to be respectful,
23 does she in general use --- prefer to be referred to as
24 Professor Lambelet-Coleman or simply Professor Coleman?

1 A. I don't know the answer.

2 Q. Okay.

3 A. I prefer to her on a first name basis.

4 Q. All right.

5 I will stick with the shorter version. In
6 paragraph 393 the panel describing Professor Coleman's
7 submission states, quote, Professor Lambelet-Coleman's
8 report compared the lifetime best performance of three
9 elite female athletes in the 400-meter event with the
10 performance of male athletes in the same event during a
11 single year, 2017, period. This showed not only that
12 the elite females would have lost to the best men by a
13 margin of about 12 percent but also that even at their
14 absolute best the elite females would have lost to
15 thousands of other boys and men by a much smaller
16 margin, closed quote. Do you see that language?

17 A. I do.

18 Q. And do you have any reason to doubt the accuracy
19 of that summary of athletic performance statistics?

20 A. I can't render an expert opinion there.

21 Q. Do you as you sit here today have any reason to
22 doubt the accuracy of those statistics?

23 A. Again, I cannot comment as an expert. I guess
24 that's the bottom line.

1 Q. If it is true that the most elite female
2 athletes performing at their absolute best would lose to
3 thousands of others boys and men. It is also true,
4 would you not agree, that the very best female college
5 athletes would lose to even a larger number of
6 collegiate boys and men?

7 A. If I'm speaking as an expert, then I'm not
8 rendering an opinion there.

9 Q. How about as a highly educated and intelligent
10 professor?

11 A. Simply in that context, it would be true that
12 --- that it would least be true at some level in the
13 elite levels of college.

14 Q. And the very best female high school athletes
15 would lose to an even larger number of high school boys.

16 Correct?

17 A. So now I can render a little bit of an expert
18 comment, which is that as you move down that line, the
19 degree of difference falls because the degree of
20 testosterone impact on body is evolving across those
21 ages.

22 Q. If it's true that the world fastest female
23 athletes would lose to thousands of boys and men then it
24 is inevitably true, is it not, Doctor Safer, to say that

1 the very best female high school athletes would lose to
2 even larger numbers of high school boys?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: So the --- it is the coils
5 here. So it would be larger numbers of cisgender men in
6 general, including people who are older than they are,
7 but I'm not sure where that would be going.

8 BY ATTORNEY BROOKS:

9 Q. Let me take you back to your expert report,
10 Exhibit 1, and take you to paragraph 48. Actually, let
11 me have the Declaration, which is Tab 50.

12 ATTORNEY BROOKS: Let me mark as Safer
13 Exhibit 6 a Declaration of Dr. Safer executed in
14 May 10th, 2021.

15 ---
16 (Whereupon, Exhibit 6, 5/10/21 Declaration
17 of Dr. Safer, was marked for
18 identification.)

19 ---

20 BY ATTORNEY BROOKS:

21 Q. And I apologize, it's paragraph 50. Dr. Safer,
22 did you, in fact, prepare and execute this Declaration
23 in the time leading up to May 26, 2021?

24 A. Yes.

1 Q. And you state in paragraph 48 that, quote, age,
2 grade competitive sports records show minimal or no
3 difference in athletic performance between
4 non-transgender boys and non-transgender girls before
5 puberty, and you cite Handelsman, the article that we
6 have been looking at.

7 Correct?

8 A. Yes.

9 Q. And what research did you do to arrive at the
10 conclusion that age grade competitive sports records
11 show minimal or no difference in athletic performance
12 between non-transgender boys and non-transgender girls?

13 A. Is the question of original research on my part?

14 Q. No, what steps did you take to arrive at that
15 conclusion?

16 A. Reading relevant literature.

17 Q. You cited only Professor Handelman's 2018
18 article. Did you read other literature that gave you
19 comfort that is a true statement?

20 A. I have read other literature, but I would
21 suggest that Doctor Handelsman gave --- Doctor
22 Handelsman's paper is the best summary of the point.

23 Q. And again, in making this statement, what did
24 you consider to be a minimal difference?

1 A. When I'm thinking about this as a scientist it
2 is a difference where I'm not sure if it is true or
3 whether it is significant when defining the word
4 minimum.

5 Q. You just defined minimal by using the work
6 significant. You force me to ask you what do you mean
7 by significant?

8 A. Sorry. So as a scientist --- well, there are
9 two definitions of significant. So the one is that it
10 is relevant for those --- for decision makers. And that
11 actually gets outside of my expertise. And then we do
12 use it as a term of art in science as well.

13 Q. You meant statistically significant?

14 A. The second would be statistically significant,
15 that's right.

16 Q. Dr. Safer, you deleted that sentence from your
17 expert report.

18 Is that correct?

19 A. I have to look.

20 Q. I don't mean it to be a trick question. Let me
21 ask you this. Do you recall removing that sentence as
22 you revised your Declaration to create your expert
23 report?

24 A. No.

1 Q. All right.

2 A. I don't recall.

3 Q. We will just move on to the science and not ask
4 you deleted the question. Let me take you to paragraph
5 44 of your expert report, Exhibit 1. And just to be
6 sure, you are on the expert report now and not the
7 Declaration? They are so similar that it is easy to get
8 confused.

9 A. Yes.

10 Q. Paragraph 44 you say in the second sentence,
11 increased testosterone begins to affect athletic
12 performance at the beginning of puberty, but those
13 effects continue to increase each year of puberty until
14 about 18, with the full impact of puberty resulting from
15 the cumulative effect of each year. Do you see that
16 language?

17 A. I do.

18 Q. And just to clarify, in making this statement
19 what do you refer to as, quote, the beginning of
20 puberty? And we're talking about male typical puberty
21 in this discussion so as to clarify. So what do you
22 have in mind as the beginning of male puberty?

23 A. So the answer is complex. The typical male
24 puberty is defined as beginning with what we label as

1 Tanner 2. And in terms of when you would see impact on
2 athletic performance, per se, is not well established.

3 Q. And now stretching that in both directions, on
4 the one hand Tanner Stage 2, if I'm correct, is
5 essentially defined as certain first observable physical
6 changes in a boy's body.

7 Right?

8 A. Tanner 2 is specifically defined as specific
9 observable changes in a person's body, yes.

10 Q. And therefore, testosterone levels have begun to
11 increase even before the first observable changes that
12 result.

13 Correct?

14 A. The way it's understood in medicine is it is
15 reflective of existing reality. So it is not
16 necessarily --- you know, only in the absolute.

17 Q. Well, as a medical doctor, you would agree with
18 me or would you not that testosterone levels must
19 increase in the body before observable changes in the
20 body caused by testosterone can be --- can come about?

21 ATTORNEY BLOCK: Objection to the form.

22 THE WITNESS: So it must be the case that
23 the testosterone levels would have to rise prior to
24 their having a noticeable effect, that is true.

1 BY ATTORNEY BROOKS:

2 Q. Cause has to precede effect?

3 A. Cause in this case has to precede effect,
4 exactly. But I caution that it is not clear that that's
5 something that we could parse out medically in a given
6 person in a reasonable way. That is I don't know that I
7 could do a blood test and catch it as it were.

8 Q. Okay.

9 Can you explain to me what you were referring
10 to when you mentioned the cumulative effect of pubertal
11 changes at the end of that sentence?

12 A. Where are we now?

13 Q. We are in the second sentence of paragraph 44 of
14 Exhibit-1. And you say at the end with a full impact of
15 puberty resulting from the cumulative effect of each
16 year, and if you would explain for the Court what you
17 meant by cumulative effect that would be helpful.

18 ATTORNEY BLOCK: Objection to form.

19 THE WITNESS: So the testosterone has
20 impact on certain tissues, and then it continues to have
21 impact on tissues. And I don't know that I have any
22 greater explanation for the right cumulative impact.

23 BY ATTORNEY BROOKS:

24 Q. So your point is that by the age of 18 whatever

1 advantages in athletic performance a particular male has
2 is due to body changes that have happened each year
3 since puberty began, not due simply to the testosterone
4 level of that individual at age 18?

5 ATTORNEY BLOCK: Objection to form.

6 THE WITNESS: The meaning isn't as --- I
7 guess I would be careful about overstating it, so there
8 can --- there might be some impact earlier and then
9 there might be additional impact over time, but --- and
10 so in the absolute it would be true to say that all of
11 the effect doesn't occur at Tanner 5, which is the
12 defined end.

13 BY ATTORNEY BROOKS:

14 Q. Okay.

15 The cumulative physiological changes that you
16 are referring to here result from a multi-year history
17 of male typical levels of testosterone by age 18.

18 Correct?

19 A. Yes. Well, even that is --- there's complexity
20 but yes.

21 Q. You say --- sorry, we are jumping back and
22 forth.

23 A. Actually, just continuing a little bit further,
24 it's also about age 18 is not a trivial word.

1 Q. Understood. And I simply used that as a
2 representative end marker and for some individuals it
3 would be earlier and for some individuals it would be
4 later.

5 Correct?

6 A. That's right, even with the college athletes.

7 Q. You state at the beginning of paragraph 44 that,
8 quote, the concerns that animated the World Athletics
9 and prior IOC policies are even more attenuated for
10 students in the middle of high school where athletes
11 typically range from 11 to 18.

12 Do you see that?

13 A. I do. Was this paragraph 44?

14 Q. It is. And by attenuated you mean the same in
15 nature but smaller in scale.

16 Correct?

17 ATTORNEY BLOCK: Objection to form.

18 THE WITNESS: Yeah, I can't even say that
19 so --- yeah, I can't ---.

20 BY ATTORNEY BROOKS:

21 Q. Isn't that what attenuated means?

22 ATTORNEY BLOCK: Objection to form.

23 THE WITNESS: Attenuated is both in scale
24 and type in this case.

1 BY ATTORNEY BROOKS:

2 Q. All right.

3 You are not here or anywhere denying that the
4 same type of concern, that is physiological advantages,
5 exist at for instance age 15?

6 ATTORNEY BLOCK: Objection to form.

7 THE WITNESS: So sorry, say that again.

8 BY ATTORNEY BROOKS:

9 Q. You are not in this paragraph or anywhere
10 offering an opinion that the same type of concerns, that
11 is physiologic or in performance advantages, exist to
12 some degree at, for instance, age 15?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: I'm not offering an opinion
15 there, that's right.

16 BY ATTORNEY BROOKS:

17 Q. And the same is true at age 13?

18 ATTORNEY BLOCK: Objection to form.

19 THE WITNESS: I'm not --- so I guess as
20 we --- as you move along to the continuum, then ---.

21 BY ATTORNEY BROOKS:

22 Q. It gets more attenuated?

23 A. The opinion --- right, the opinion shifts
24 because it depends on context.

1 Q. In paragraph 49 of your expert report you write
2 in the third full sentence, quote, West Virginia
3 categorically prevents girls who are transgender from
4 participating on girls teams regardless of whether they
5 are prepubertal, receiving puberty blockers, or
6 receiving gender-affirming hormone therapy, closed
7 quoted. Do you see that?

8 A. I do.

9 Q. What in your opinion is the significance of that
10 statement? What is your point?

11 ATTORNEY BLOCK: Objection. Could you
12 just give him some time to read the context?

13 BY ATTORNEY BROOKS:

14 Q. Yes.

15 A. So I guess I maybe make the --- help me with
16 where you're going with that question. I'm --- the rule
17 as written includes all transgender girls.

18 Q. Are you --- did you mean to suggest that medical
19 science would dictate that the West Virginia law should
20 make an exception for natal males who have
21 suppressed puberty?

22 ATTORNEY BLOCK: Object to form.

23 THE WITNESS: The context for the --- the
24 context of different transgender girls with different

1 degrees of treatment and different stages of puberty are
2 different. I guess that's as much I would say. I'm not
3 expressing an opinion about what the --- I'm serving
4 here just as a scientist in terms of what the --- what
5 the --- what we know about athleticism.

6 BY ATTORNEY BROOKS:

7 Q. You are not offering an opinion that either
8 science or reasonableness requires that West Virginia's
9 laws make an exception for natal males who have
10 suppressed puberty?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: I'm not offering an opinion
13 that that would be --- that would be a logical law for
14 transgender girls in that circumstance.

15 BY ATTORNEY BROOKS:

16 Q. And in the article that we began today looking
17 at you expressed concern about policies that would
18 create incentives for children to begin puberty
19 blockers, would you not?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: So earlier in my --- I
22 reference that as a concern. I want to be clear that as
23 an expert I'm not suggesting that --- I'm not suggesting
24 an expert opinion that these needs to be concerns. I'm

1 raising the issues that we are considering.

2 BY ATTORNEY BROOKS:

3 Q. Well, what you wrote to educate your colleagues
4 as an endocrinologist, you, Professor Safer, raise that
5 as a concern?

6 ATTORNEY BLOCK: Objection to form.

7 THE WITNESS: To be clear, I raised it as
8 a concern of the community. I did not take an opinion
9 in that article that it was a concern that I was
10 offering as an expert.

11 BY ATTORNEY BROOKS:

12 Q. Well, let me ask you as a medical doctor sitting
13 here today, an endocrinologist, it would cause you
14 concern, would it not, that policies are adopted that
15 created incentives for children to start puberty
16 blockers when they might otherwise not choose to do so?

17 ATTORNEY BLOCK: Objection to form and to
18 scope.

19 THE WITNESS: It's too broad of a
20 question as you're asking it because there is certainly
21 --- in medicine it is certainly the case that we fear
22 coercing people to certain treatments and certain
23 circumstances but they are certainly alternate examples
24 where we very much coerce people to have certain medical

1 interventions. And so as an expert I have no opinion,
2 as we said already. And simply as somebody trying to be
3 logical and thoughtful I can come up with examples in
4 both certain circumstances.

5 BY ATTORNEY BROOKS:

6 Q. I'm going to ask you to take Exhibit-6 --- no,
7 Exhibit 4, the Handelsman article if you would.

8 A. Yes.

9 ATTORNEY TRYON: Roger, would you speak
10 up a little more, please? And Josh, when you shuffle
11 your papers, it really garbles the testimony. If you'd
12 be a little more careful about that, I'd appreciate it.

13 ATTORNEY BLOCK: Sorry.

14 ATTORNEY BROOKS: It's a crowded table
15 and we have papers bumping up against the mic. So just
16 call out if we do that wrong.

17 BY ATTORNEY BROOKS:

18 Q. So Dr. Safer, you pointed to the Handelsman
19 article as the best source on the proposition --- on the
20 question to what extent if any natal male has
21 physiological or I should say athletic performance
22 advantages over natal females before puberty.

23 Correct?

24 ATTORNEY BLOCK: Objection to

1 terminology?

2 THE WITNESS: And if I said the word best
3 maybe that's not the best way of saying it, but it's a
4 very clean, well-written summary of the circumstance.

5 BY ATTORNEY BROOKS:

6 Q. At any rate, it's the one that you chose to
7 cite?

8 A. And it is the one that I chose to cite.

9 Q. I'm going to give you a three by five card to
10 help read a chart that doesn't have grid lines on it so
11 you have a straight edge. And I want to take you in
12 Handelsman's 2018 article, Exhibit 4, to page 813 and
13 figure one. And you've familiar with this figure and
14 these curves, are you not?

15 A. I am, yes.

16 Q. When you studied this article carefully this is
17 part of what you studied.

18 Right?

19 A. It is.

20 Q. And these charts show percentage performance
21 advantage of males over females and just to simplify
22 terminology I believe there's nothing in here about
23 dealing with transgender individuals in these charts.
24 So with your permission I'll simply use male and female

1 to be the dare I say simple biological designations as
2 we had previous discussions. Is that acceptable?

3 A. I think so.

4 Q. If it's something that comes up ---.

5 A. I will mention it, yes.

6 Q. I don't think it will in this discussion. First
7 of all, would you agree with me that, generally
8 speaking, junior high contemplates grades 7 through 9
9 and commonly ages in the range of 12 to 15?

10 ATTORNEY BLOCK: Objection to form.

11 THE WITNESS: Junior high is grades 7
12 through 9. It used to be. Now there is Middle School.

13 BY ATTORNEY BROOKS:

14 Q. I know?

15 A. Exactly.

16 Q. Let's just work with you and I are of general
17 age. So Junior High is 7 to 9?

18 A. Okay.

19 Q. And in your general understanding, this is
20 layman's stuff, not expert stuff, that is ages 12 to
21 15-ish?

22 A. Let's see, seven --- let me think about this.
23 Right, 15 at about the max, right, because there is
24 about 14.

1 Q. And high school is 14, 15 through age 18-ish.
2 Some people graduate at age 17?

3 A. Yes. As a non-expert I would believe, yes.

4 Q. All right.

5 And this chart charts the percentage advantage
6 enjoyed --- on average enjoyed by males over females in
7 three different events at over --- on a year by year
8 basis from ages 10 up to 19.

9 Am I describing it correctly?

10 ATTORNEY BLOCK: Objection to form. Just
11 for the record, it's percentage differences, not
12 percentage advantages.

13 BY ATTORNEY BROOKS:

14 Q. Correct, it says --- it says gender difference
15 percentage to read the Y axis.

16 A. Clear, yes.

17 Q. Okay.

18 So let's look at running and you have your
19 straight edge if it is helpful to you. At age 12, what,
20 according to Dr. Handelsman, is the gender difference in
21 running performance?

22 A. So in this paper there is a range. But just to
23 help you get to your point faster I guess we can --- it
24 is about five percent of tab over.

1 Q. And for reasons best known to Professor
2 Handelsman, his arrow bars extend only upwards, correct,
3 in this chart?

4 A. Right. I will have to attribute that to
5 cleanliness of the figure.

6 Q. Or if he has chosen to fit his curve to the
7 bottom end of this error range possibly?

8 ATTORNEY BLOCK: Objection to form.

9 THE WITNESS: Yeah, I can't comment
10 there, but that wouldn't be usual.

11 BY ATTORNEY BROOKS:

12 Q. That would not be usual, I agree. And what
13 advantage --- what gender difference between male and
14 female does Professor Handelsman report at age ten
15 approximately?

16 A. At age ten in the particular figure that we are
17 referencing it is --- the average is --- well, actually,
18 so here it ranges from about two percent because that is
19 probably how the air bars are meant to be up to just a
20 little north to three percent.

21 Q. And going back to age 12, do you consider a five
22 percent difference between male and female performance
23 to be minimal?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: So the problem here with
2 going right to this figure is it's including a range of
3 inputs, and so this is --- so these are what are called
4 cross-sectional studies, and so the --- if your question
5 is just in the narrow point of this five percent
6 minimal, well, even there I don't know that I can
7 comment because it depends on how broad the variation is
8 among the group.

9 BY ATTORNEY BROOKS:

10 Q. And what gender difference did Dr. Handelsman
11 report in running at age 15?

12 A. At age 15, a range that is hovering about 9 to
13 10 percent.

14 Q. And by age 15, according to his sample, the
15 gender difference is approached --- begins to level off.
16 In other words, it has --- most of the gender difference
17 has been achieved at age 15.

18 Correct?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: Among this data in this
21 study set, yes, I will agree with you it does level off.

22 BY ATTORNEY BROOKS:

23 Q. So let me ask you this. Do you have an
24 understanding of the physiological basis of what you

1 described as a two to three percent male advantage at
2 age ten in running?

3 ATTORNEY BLOCK: Objection to form.

4 BY ATTORNEY BROOKS:

5 Q. If any?

6 A. So speaking as an expert, there's no --- there
7 is no physiological --- there is no expectation of a
8 physiological explanation. And there is awareness of
9 other confounders in terms of experience, exposure to
10 sport and things like that.

11 Q. Let me ask you to look at jumping, at age ten.
12 And this is --- at age ten what performance of gender
13 difference advantage did Dr. Handelsman report for boys
14 in jumping?

15 A. So at age ten it would go on --- so at age ten
16 then the range ---.

17 Q. This by the way tells us that he cannot be
18 inclined in arrow bar --- a symmetrical arrow bar below.

19 Correct?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: So he can't. In fact, the
22 range that he's showing there goes from an advantage for
23 girls --- that is it goes below to an advantage --- for
24 boys. The range is included and it just --- for both

1 sexes.

2 BY ATTORNEY BROOKS:

3 Q. So what is the average advantage that he reports
4 at age ten for boys?

5 A. So in this dataset the average is about a six
6 percent average for boys, but it is important to
7 understand the data. And the data that --- the point
8 being that if we were to repeat the study you would
9 anticipate that that average would fall across those
10 entire --- the entire range shown so that in a different
11 day it might show a bigger advantage for boys, but a
12 different day it might also show an advantage for girls
13 about higher.

14 Q. Are you aware of any dataset that shows a
15 smaller advantage in jumping for girls at age ten?

16 A. Off the top of my head I cannot guide --- lead
17 you to a dataset.

18 Q. At age 12 what advantage in jumping --- well,
19 let me start over. At age 12 what advantage in jumping
20 does Dr. Handelsman report for boys?

21 A. So in this dataset at age 12 he shows the
22 advantage --- the average advantage to be of the less
23 than the average advantage for age ten, but this exactly
24 points to the caution that I was referencing, which is

1 that the range of possibilities that you might
2 anticipate based on this particular dataset at age 12
3 has a range of four to six percent advantage for boys.

4 Q. The arrow bar has tightened up a lot?

5 A. The arrow bar in that age range is tighter.

6 Q. And do you consider a six percent advantage to
7 be minimal?

8 ATTORNEY BLOCK: Objection to form.

9 THE WITNESS: As an expert I can't answer
10 that because it depends on context on the heterogeneity
11 of all these events.

12 BY ATTORNEY BROOKS:

13 Q. And at age 15 what average advantage in jumping
14 did Dr. Handelsman report for boys?

15 A. For age 15 he has a range or the average sits at
16 15 percent and the range runs from about 14 percent to
17 maybe 17 percent.

18 Q. Is there any context in your opinion, any
19 athletic endeavor that involves jumping in which a 15
20 percent advantage is in your view minimal?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: Yes, I think as an expert I
23 can't answer that. If you're thinking at the scholastic
24 level where there is a wide range of --- where there's a

1 quite wide range of heterogeneity in development, body
2 type, et cetera, I certainly could envision a situation,
3 yes.

4 BY ATTORNEY BROOKS:

5 Q. Dr. Safer, in your Declaration filed in May you
6 stated that before puberty athletic advantage by boys
7 was minimal. Do you recall that language?

8 A. The way I would say it is the difference between
9 boys and girls before puberty is minimal or
10 non-existent. I don't know if I could be wiser than
11 that.

12 Q. All right. But now you are telling me when I
13 asked you questions about minimal that you as an expert
14 are not able to define minimal. How do you reconcile
15 those two?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: So the definition of
18 minimal is in context. And so as we discussed it was
19 not a significant difference using both those
20 definitions that we already used were no different at
21 all.

22 BY ATTORNEY BROOKS:

23 Q. Your statement in your Declaration simply
24 asserted categorically in almost no context that the

1 difference in athletic capability of boys to girls were
2 both minimal. My question for you is using whatever
3 definition you had in mind when you wrote that do you
4 consider a --- I will look at jumping, a five percent
5 difference in capability to be minimum?

6 ATTORNEY BLOCK: Objection to form and
7 characterization of the report.

8 THE WITNESS: So it's a context. So in
9 the report the reference is to prepubertal children.
10 And there it is easier to be more categorical. Where
11 now we're moving into an area where there is --- where
12 things are more complex and so it is a harder context to
13 make that statement.

14 BY ATTORNEY BROOKS:

15 Q. That is a sample of ten-year old boys includes
16 some who are no longer prepubertal.

17 Correct?

18 A. No. I'm saying it more the other way, which is
19 a sample of ten-year-old boys would overwhelmingly be
20 prepubertal but a sample of 15-year-old boys would have
21 more of a range and have more heterogeneity. And
22 there's more to it even than that, which is the
23 definition of minimal also includes the context of the
24 entire population who participated in the sport.

1 Q. So focusing on ten-year-old boys and jumping you
2 said at age ten the large majority of boys are,
3 according to your definition, prepubertal. Referring
4 back to Declaration and the meaning that you ascribed to
5 the word minimal there, in your view, is a six-percent
6 difference in capability minimal or not minimal?

7 ATTORNEY BLOCK: Objection to form and to
8 talking about his Declaration without it being in front
9 of him.

10 ATTORNEY BROOKS: He has it in front of
11 him and we already looked at the language.

12 BY ATTORNEY BROOKS:

13 Q. You may answer.

14 A. So the graph that we are looking at includes
15 arrow bars that include the possibility that boys would
16 have --- that the girls would have a superior outcome,
17 and so the answer then becomes, yes. Where the data are
18 either small or are suspect or not significant, then all
19 of that collectively certainly is --- would be included
20 as minimal to non-existent.

21 ATTORNEY BROOKS: Let me mark as Exhibit
22 Safer 7 a paper by Emma Colton and Tommy Lundsburg
23 entitled Transgender Women in a Female Category of
24 Sport, from 2021, previously marked as Exhibit 13 at Dr.

1 Adkins's deposition.

2 ---

3 (Whereupon, Exhibit 7, Transgender Women In
4 a Female Category of Sport, was marked for
5 identification.)

6 ---

7 BY ATTORNEY BROOKS:

8 Q. And first, Professor Safer, let me ask whether
9 you're familiar with this paper published last year?

10 A. I am familiar.

11 Q. And have you interacted professionally with
12 either Dr. Colton or --- and I don't know his degree,
13 Mr. Lundsburg in any context?

14 A. Here I don't remember.

15 Q. Okay.

16 Do you believe that you became aware of this
17 paper soon after it was published?

18 A. I don't know if I can answer that cleanly
19 either, but I certainly have become aware of it
20 somewhere between then and now.

21 Q. And have you read it with some care?

22 A. I have read it with some care, yes.

23 Q. Let me ask you --- well, let me ask you this
24 first. Would you describe this paper as reporting

1 original research or as more of a literature review
2 paper?

3 A. I don't recall them reporting on their original
4 research, but I would have to look. It's mostly a
5 review paper.

6 Q. That is also my impression. I just didn't want
7 to create a different impression. Let me ask you to
8 turn to page 201, and there in the first column
9 beginning six lines down there is a sentence that begins
10 an extensive review. Let me ask you to find that.

11 A. I have it.

12 Q. And that --- I'll read it into the record.
13 Quote, an extensive review of fitness data from over
14 85,000 Australian children age 9 to 17 years old showed
15 that compared with nine-year-old females, nine-year-old
16 males were faster over short sprints, 9.8 percent, and
17 one mile, 16.6 percent, could jump 9.5 percent farther
18 from a standing start, which tested explosive power,
19 could complete 33 more push-ups in 30 seconds and have
20 13.8 percent stronger grip. Male advantage of a similar
21 magnitude was detected in a group study of children
22 where compared to a six-year old females six-year old
23 males competed 16.6 percent more shuttle runs in a given
24 time and could jump 9.7 percent further from a standing

1 position. Do you see that language?

2 A. I do.

3 Q. And on the Australian study, if you follow the
4 footnote you will see that it references a study by
5 Kaitlin Thompkinson. That's footnote 22. And my first
6 question is have you read the reference study by Kaitlin
7 Thompkinson?

8 A. I don't recall. I'm guessing yes.

9 Q. All right. All right.

10 Do you have any reason to doubt the accuracy of
11 this summary of the findings of Kaitlin Thompkinson
12 based on data from over 85,000 Australian children?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: I think the important thing
15 to recognize when you look at these sorts of data are
16 recognizing the multiple inputs. So the larger these
17 groups --- these cross-sectional studies get the more
18 confounded they get by access and other social
19 explanations why there are boys participating in sports
20 to a greater degree.

21 BY ATTORNEY BROOKS:

22 Q. So putting aside causation, which might be
23 physiological and might be cultural, as you said there
24 could be various causes, do you have any reason to doubt

1 the accuracy of the findings of performance advantage
2 summarized here in the passage that I've just read?

3 ATTORNEY BLOCK: Objection to form and
4 terminology.

5 THE WITNESS: Putting aside causation, I
6 have no --- I can't offer an expert opinion I guess if
7 that's the bottom line. But if you're asking me just as
8 an individual, I'm not expecting that they're
9 fabricating that data. I am not expecting that.

10 BY ATTORNEY BROOKS:

11 Q. And you agree that advantages on a scale of 9
12 percent, 16 percent could provide a significant
13 advantage in athletic competition, do you not?

14 ATTORNEY BLOCK: Objection to
15 terminology.

16 THE WITNESS: So say that question again.

17 BY ATTORNEY BROOKS:

18 Q. You agree that advantages on the scale of
19 9.8 percent or 16.6 percent would provide a large
20 advantage in athletic competition, do you not?

21 ATTORNEY BLOCK: Same objection to
22 terminology.

23 THE WITNESS: In elite athletic
24 competition, yes.

1 BY ATTORNEY BROOKS:

2 Q. Did you play any sport in high school?

3 A. At a sophisticated level I did not.

4 Q. Your general knowledge permits you to say, does
5 it not, that at the high school level also a 9.8 percent
6 or a 16.6 percent advantage is a very large advantage?

7 ATTORNEY BLOCK: Objection to form and
8 terminology?

9 THE WITNESS: So there it gets more
10 diffuse, therefore, and I can't answer as an expert.

11 BY ATTORNEY BROOKS:

12 Q. Can you answer as an informed adult citizen?

13 ATTORNEY BLOCK: Same objection.

14 THE WITNESS: So as an expert for sure
15 not. As an informed adult, it falls back to the same
16 situation. When there is a wide range of athletes in a
17 certain context, then it is going to seem less relevant.
18 And obviously with the example I gave before with an
19 elite circumstance where that --- it describes the
20 entire field is more significant.

21 BY ATTORNEY BROOKS:

22 Q. Let me ask you to find your rebuttal report.

23 A. And actually --- do others need a break?

24 Q. Any time --- your concentration is most

1 important. So if you need a break, we'll take a break.

2 A. So I'm good.

3 ATTORNEY BROOKS: Well, obviously, if
4 anybody wants a break, we can take a break.

5 ATTORNEY BLOCK: Do you need a break?

6 ATTORNEY SWAMINATHAN: No.

7 ATTORNEY BLOCK: We are good.

8 THE WITNESS: So my rebuttal.

9 BY ATTORNEY BROOKS:

10 Q. Your rebuttal, which is Exhibit 2, so it's
11 probably at the bottom. And in that I'm going to draw
12 your attention to paragraph 11. And there you wrote
13 there is also no basis to confidently predict the
14 patterns about the athletic performance of prepubertal
15 cisgender boys will be the same for prepubertal
16 transgender girls, closed quote. Do you see that?

17 A. I do.

18 Q. And let me attempt to see if I understand the
19 point of this paragraph. And indeed, if you would like
20 to read the whole paragraph you should. But my
21 understanding of the point is that you're saying that
22 even if prepubertal boys have some performance, some
23 statistically significant performance advantage over
24 prepubertal girls, that you are not confident that the

1 athletic performance capabilities of natal males who
2 identify as females before puberty will be the same as
3 those of natal males who identified as male before
4 puberty?

5 ATTORNEY BLOCK: Objection to the
6 terminology.

7 THE WITNESS: So to the extent --- so
8 were differences to be determined between cisgender boys
9 and cisgender girls, it is correct to say that that
10 won't conclusively demonstrate that the same applies for
11 transgender girls. That's right.

12 BY ATTORNEY BROOKS:

13 Q. Now, elsewhere in your writings you have said
14 that it is well known that the majority of prepubertal
15 children who experience gender dysphoria do not persist
16 in that dysphoria into pubertal adolescence.

17 Correct?

18 ATTORNEY BLOCK: Objection.

19 THE WITNESS: No.

20 BY ATTORNEY BROOKS:

21 Q. Not correct?

22 A. Not correct.

23 Q. Then we will come back to that. In this
24 paragraph 11, you speculate a little farther down that,

1 quote, the experience of transgender girls might be more
2 similar to the experience of cisgender girls?

3 ATTORNEY BLOCK: Objection to the
4 characterization and speculative.

5 BY ATTORNEY BROOKS:

6 Q. Well, by using the word might you meant to
7 indicate, did you not, Dr. Safer, this is a hypothesis,
8 this is not a documented fact?

9 A. That if the question is do I know that the
10 experience of transgender girls is definitely in this
11 circumstance the same as cisgender girls, that's right,
12 I don't know that. It only might be true.

13 Q. And towards the end, in the last line, you refer
14 to potential biological underpinnings of gender
15 identity. Again, the word potential signaling that no
16 such specific underpinnings have yet been identified.

17 Correct?

18 A. Say that question again.

19 Q. In the last line, your reference to, quote,
20 potential biological underpinnings of gender identify,
21 by the word potential you are indicating that no
22 specific biological underpinning has yet been
23 identified.

24 Correct?

1 ATTORNEY BLOCK: Objection to form.

2 THE WITNESS: So it's --- so no,
3 potential in this context does reference that most of
4 this biology is unknown, so that part is true, but it
5 doesn't mean that there is nothing known.

6 BY ATTORNEY BROOKS:

7 Q. You do not propose to offer any opinion that
8 natal males --- let me strike that and start again.

9 You do not propose to offer any opinion, do
10 you, that prior to puberty natal males who identify as
11 female are less athletic capable on average than natal
12 males who identify as male?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: I'm not offering an opinion
15 with regard to cisgender --- excuse me --- cisgender
16 boys versus transgender girls and their athleticism when
17 they are prepubertal. If that's what you are asking,
18 then yes, I'm not offering an opinion between those two
19 groups. I'm simply raising the possibility that
20 something like biology associated with transgender could
21 have influence into it.

22 BY ATTORNEY BROOKS:

23 Q. Let me ask you to turn to paragraph 22 of your
24 rebuttal report. And there you write Doctor Brown also

1 refers to widely publicized anecdotes about isolated
2 cases of transgender girls and women state championships
3 in high school sports or NCAA championships in college.

4 Do you see that?

5 A. I do.

6 Q. And you go on to write but transgender athletes
7 of women have been competing in NCAA and secondary
8 school athletics for many years at this point, closed
9 quote. Do you see that language?

10 A. I do.

11 Q. Let me ask you to name all instances of male
12 males known to you who have competed in women's division
13 varsity athletics in any athletic endeavor for any NCAA
14 member school?

15 ATTORNEY BLOCK: Objection to form and
16 scope.

17 THE WITNESS: Right, so I certainly can't
18 do that usefully off the top of my head, name
19 transgender women and all these context in such an
20 exhaustive way like that.

21 BY ATTORNEY BROOKS:

22 Q. Well, I asked you accused Doctor Brown of citing
23 isolated cases. Do you have any basis to assert that he
24 has done anything other than cite all cases in which

1 natal males have competed in NCAA athletics in the
2 female category?

3 A. So the --- if our focus is on the word isolated
4 then per se they are all --- these are all isolated
5 cases. These aren't systematic analyses of any cohort
6 of people.

7 Q. You are not accusing Doctor Brown of picking and
8 choosing?

9 ATTORNEY BLOCK: Objection to form.

10 THE WITNESS: So let me think about that.

11 By simply choosing individual cases that are in the
12 press then it is by its nature picking and choosing.

13 BY ATTORNEY BROOKS:

14 Q. What do you mean by that?

15 A. Well, these are simply individual cases that
16 have --- that have come to public attention, and so I
17 --- so --- and that's the basis of my statement as
18 opposed to some exhaustive attempt to identify
19 transgender people in a systematic fashion.

20 Q. As you sit here today, Dr. Safer, are you aware
21 of a single case not mentioned by Doctor Brown in his
22 report of a natal male who has competed in NCAA
23 athletics in the women's category?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: Can I name somebody off the
2 top of my head? I cannot.

3 BY ATTORNEY BROOKS:

4 Q. Do you have any concrete --- leaving aside
5 whether you remember a precise name, do you have any
6 factual basis to know that Doctor Brown has omitted any
7 case of a natal male who has competed in the female
8 division of NCAA athletics?

9 ATTORNEY BLOCK: Objection to form.

10 THE WITNESS: So I guess if the question
11 is what can I do off the top of my head, then I cannot.

12 BY ATTORNEY BROOKS:

13 Q. Off the top of your head, you recall the case of
14 June Eastwood, do you not?

15 A. You have to remind me what that is.

16 Q. A runner in Montana?

17 A. I actually would need to be reminded of those
18 details.

19 Q. All right. Certainly you recall Lia Thomas
20 because none of us can mis Lia Thomas these days?

21 A. Lia Thomas is still in the news.

22 Q. Do you recall the case of CeCe Telfer?

23 A. Names are not my strength.

24 Q. All right. No more on that.

1 You say at the end of this paragraph, quote,
2 the occasional championship that has been widely
3 publicized do not come close to constituting the rates
4 one would expect if they, that is transgender athletes,
5 wanted rates that are proportional to their overall
6 percentage of the population, which is approximately one
7 percent. Do you see that language?

8 A. I do.

9 Q. Do you have any knowledge as to what --- first
10 of all, let me ask, what is your basis for believing
11 that the current student population in college and high
12 school level is approximately one percent transgender?

13 A. The statistic for the percentage of the
14 population who are transgender comes from surveys.

15 Q. And do you have any knowledge at all as to what
16 percentage of varsity athletes in America today at the
17 NCAA --- among NCAA member schools in the women's
18 division are transgender?

19 A. If the question is that a survey in that
20 population, I'm not aware of a survey that's been done.

21 Q. So you don't know whether the number of
22 victories of championships that have been taken in the
23 women's division by transgender competitors is higher or
24 lower than the percentage of athletes in those divisions

1 who are transgender?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: That is correct. I do not
4 know the percentage that --- what we know is the
5 percentage of transgender people and then we know the
6 percentage of identified athletes winning competitions.
7 And even then we don't know that absolutely. We only
8 know the ones that are publicized. But, right, in the
9 in between, we don't have statistics. That's right.

10 ATTORNEY BROOKS: Counsel, I'm going to
11 suggest --- in my experience, if we break for lunch at
12 noon, it makes it a little long afternoon. So I would
13 suggest that we take a short break now and then keep
14 going until like 12:45 or something. It's seven hours
15 on the clock and I'm here just to tell you that the
16 afternoon gets long. So unless you are starving I'd
17 recommend ---?

18 THE WITNESS: No, I think that's a great
19 idea.

20 ATTORNEY BROOKS: Take a short break now.

21 THE WITNESS: So you don't know who is on
22 the phone so give them a break.

23 ATTORNEY BROOKS: Let's go off the
24 record.

1 VIDEOGRAPHER: Going off the record. The
2 current time reads 12:01:00 p.m. Eastern Standard Time.
3 OFF VIDEOTAPE

4 ---
5 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

6 ---
7 ON VIDEOTAPE

8 VIDEOGRAPHER: Back on the record.
9 Current time reads 12:14 p.m. Eastern Standard Time.

10 ATTORNEY BROOKS: Let me mark as Safer
11 Exhibit 8 the Endocrine --- Treatment of Gender
12 Dysphoric Gender Incongruent Persons, an Endocrine
13 Society Clinical Practice Guidelines from 2017
14 previously marked as Adkins Exhibit 4.

15 ATTORNEY WILKINSON: Tab 5.

16 ---
17 (Whereupon, Exhibit 8, Endocrine Society
18 Guidelines, was marked for identification.)

19 ---

20 BY ATTORNEY BROOKS:

21 Q. And Doctor Safer, am I correct you served the
22 committee that created this revised version of the
23 Endocrine Society's Guidelines?

24 A. Yes.

1 Q. And is it reasonable for me to assume therefore
2 that you are familiar with it in some detail?

3 A. I am familiar with it in some detail.

4 Q. They also pertain to your practice?

5 Am I correct.

6 A. And they do pertain to my practice, yes.

7 Q. Let me ask you to turn in Exhibit-5 to Page 3879
8 --- Exhibit 8, 3879. And there I will call your
9 attention to the specific recommendation that's numbered
10 1.4. And it says there we recommend against puberty
11 blocking and gender-affirming hormone treatment in
12 prepubertal children with GD/gender incongruence.

13 Do you see that?

14 A. I do.

15 Q. And then there is a section headed evidence,
16 right?

17 A. Yes.

18 Q. And the first statement in the sentence that is
19 --- in the section headed evidence is, quote, in most
20 children diagnosed with GD/gender incongruence it did
21 not persist into adolescence, closed quote.

22 Do you see that?

23 A. I do.

24 Q. Do you believe that to be a false statement?

1 A. I wouldn't --- I guess it depends on context
2 here too. So as of when this was written, the
3 literature being referenced had a broader diagnosis for
4 gender dysphoria and gender incongruence or really
5 gender dysphoria is the label that was being used and
6 still is. Gender incongruence is where we are headed.
7 And so with that broader definition, that included
8 gender expansive children who were not necessarily
9 transgender.

10 Q. The statement is I think fairly specific. And
11 as you are aware, the discussion cites various
12 references, but the introductory sentence states in most
13 children diagnosed with GD a gender dysphoria or gender
14 incongruence did not persist into adolescence. Do you
15 believe to be a true statement or false statement?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: The problem is I can't
18 answer that quite that cleanly. The statement
19 references a circumstance that I just referenced where
20 children receiving that label have to --- for the most
21 part were not transgender. The only caution I want to
22 make is that as we grow more refined in our
23 understanding of gender identity and also in our
24 labeling, that we are more specific in identifying

1 transgender kids with these sorts of labels.

2 BY ATTORNEY BROOKS:

3 Q. Well, recommendation 1.4 says we recommend
4 against puberty blocking and a gender hormone treatment
5 in prepubertal children with gender dysphoria or gender
6 incongruence. Do you have an understanding of why these
7 Endocrine Society guidelines of which you're a co-author
8 recommended against puberty blocking in prepubertal
9 children?

10 A. Yes.

11 Q. Why?

12 A. They have no impact.

13 Q. Can you point me to anywhere in the evidence
14 discussion that suggests that is the reason for this
15 recommendation?

16 A. I don't know. Let me look.

17 Q. The evidence discussion is just two paragraphs.

18 ATTORNEY BLOCK: I just want to object to
19 the extent you're limiting his review to the evidence
20 section.

21 BY ATTORNEY BROOKS:

22 Q. My question pertains to the evidence section.

23 A. So those two paragraphs are both primarily
24 referencing 1.3 and not 1.4.

1 Q. Well, let me ask you to turn to page 3881. And
2 at the top of that first column on 3881 it reads we,
3 therefore, advise starting suppression in early puberty
4 to prevent irreversible development of undesirable
5 secondary sex characteristics. However, comma,
6 adolescents with gender dysphoria, slash, gender
7 incongruence should experience the first changes of
8 their endogenous puberty because their emotional
9 reaction to these first physical changes has diagnostic
10 value in establishing the persistence of gender
11 dysphoria/gender incongruence.

12 Do you see that language?

13 A. I do.

14 Q. And as a scientist and practitioner do you agree
15 with that statement?

16 A. I would say that the validity of that statement
17 is in evolution.

18 Q. In your practice, over time --- well, let me ask
19 you this. When this was drafted did you raise an
20 objection to the proposition that the child's emotional
21 reaction to the first physical changes of puberty had
22 important diagnostic value?

23 A. I cannot recall our specific conversations, but
24 if you're asking if my view has shifted since let's say

1 2015, 2016, 2017, no, the recognition that there is an
2 evolution was already part of my opinion.

3 Q. What do you mean the recognition that there is
4 an evolution about?

5 A. So the evolution is that whether there is a need
6 to start puberty as a diagnostic --- as a necessary
7 diagnostic circumstance.

8 Q. In your practice today do you prescribe puberty
9 blockers prior to Tanner Stage 2?

10 A. I --- so two things. My practice is with
11 adults. And although I will see older kids because I
12 don't have a hard threshold of age 18, but I don't
13 prescribe puberty blockers because I don't --- my
14 practice does not include those age children. But two,
15 it is still the guidance and so the pediatricians who
16 are part of my program do not prescribe puberty blockers
17 prior to Tanner 2 for the reason I stated initially.

18 Q. And according to these guidelines, by the time
19 you reach Tanner Stage 2 there have been sufficient
20 first pubertal --- stages of pubertal development to
21 give a chance to observe the child's reaction to
22 pubertal changes for diagnostic purposes.

23 Correct?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: So the --- so I guess there
2 are kind of two pieces. The sentence is --- that
3 sentence is written, but that is the sentence that I'm
4 suggesting is an opinion that is in evolution, like I'm
5 saying, to whether that need really exists or not. The
6 reason why we still don't prescribe puberty blockers
7 before Tanner 2 is that there is no point, there is no
8 preventive element to puberty blockers and so there is
9 no point to give them before puberty begins and there is
10 no way to know that until there is an observable
11 objective finding.

12 Q. Has your own practice ever involved to a
13 significant extent treating prepubertal or early
14 pubertal stage children for gender dysphoria or gender
15 incongruence incongruence?

16 A. Have I personally cared for prepubertal children
17 who are transgender or otherwise? Actually, in the
18 subjects, no.

19 Q. And do physicians who do treat prepubertal
20 children report to you in connection with your position
21 at the clinic or the Mount Sinai Medical Hospital?

22 A. Yes.

23 Q. And do you know whether your clinic makes use of
24 children's emotional reactions to the first physical

1 changes of puberty as part of their process of
2 determining whether transgender hormonal therapies of
3 any sort are appropriate for that child?

4 A. Yeah, I can't give you give you an answer. I
5 would actually have to go survey my psychologists.

6 Q. Let me direct you to paragraph 17 of your
7 rebuttal report. And there you say in the second
8 sentence under current standards of care transgender
9 adolescents are eligible to receive puberty blockers
10 when they reach Tanner 2, not Tanner 3, which is early
11 enough to prevent endogenous puberty from taking place,
12 closed quote.

13 Do you see that?

14 A. I do.

15 Q. Now, just for context, you testified previously
16 that the large majority of minors I'll say who present
17 with gender incongruence or gender dysphoria are, in
18 fact, considerably older and have gone through at least
19 most of the Tanner stages.

20 Correct?

21 ATTORNEY BLOCK: Objection to
22 characterization.

23 THE WITNESS: Most of the people we are
24 seeing in clinical practice are coming to us at later

1 stages of development, yes.

2 BY ATTORNEY BROOKS:

3 Q. And so when we talk about prepubertal children,
4 we're talking about a small minority of the patients
5 coming in to ---?

6 A. I can't define small, but it is the minority,
7 that's correct.

8 Q. And do you believe that what your clinic is
9 seeing in that regard is typical of what's being seen
10 across the country these days?

11 A. So if I'm sitting here as an expert, I don't
12 have an expert survey to point to, to give you an answer
13 there.

14 Q. But you read the literature and you talk to
15 colleagues at other institutions.

16 Am I correct?

17 A. I certainly both read the literature and talk to
18 colleagues.

19 Q. And is it your current belief that what you are
20 seeing in terms of the breakdown of patient population
21 is similar to or quite different from what other major
22 gender clinics are experiencing?

23 A. So kind of separating, I'm living in my expert
24 role, I really want to point to data where I have any

1 confidence at all, and I have none. If you are asking
2 me in a more informal way among our conversations, then
3 I can answer that our experience seems similar to
4 others' experience.

5 Q. All right.

6 So in talking about prepubertal children ---
7 well, strike that. We've been through that.

8 In your rebuttal report when you said beginning
9 puberty blockers at Tanner stage 2 is early enough to
10 prevent endogenous puberty from taking place, let me ask
11 you, in consideration, do you believe it is accurate as
12 stated?

13 A. So Tanner 2 early enough to prevent endogenous
14 puberty from taking place, yes, that is accurate.

15 Q. You would agree with me, would you not, that the
16 endocrine guidelines of which you are a co-author
17 recommend to treat beginning puberty blockers at Tanner
18 Stage 2?

19 A. So to clarify, under the cited guidelines what
20 they say the recommendation is do not use puberty
21 blockers prior to puberty beginning, prior to Tanner 2.

22 Q. Let me direct you to recommendation 2.2 on
23 page 3880. Recommendation 2.2 reads we suggest the
24 clinicians begin pubertal hormone suppression after

1 girls and boys first exhibit physical changes of
2 puberty.

3 Do you see that?

4 A. I do.

5 Q. And then it says, paren, Tanner stages G2/B2
6 which is to say the girls Tanner 2 or boys Tanner 2,
7 correct?

8 A. That is what that means, yes.

9 Q. So the official recommendation from the
10 Endocrine Society is begin at or after Tanner Stage 2,
11 right?

12 ATTORNEY BLOCK: Objection to form.

13 THE WITNESS: That is a correct.

14 BY ATTORNEY BROOKS:

15 Q. And it says that Tanner Stage 2 is defined as
16 girls and boys first exhibiting physical changes of
17 puberty.

18 Correct?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: The definition of Tanner 2,
21 is where there is any objective evidence when puberty
22 has begun.

23 BY ATTORNEY BROOKS:

24 Q. So in fact, beginning puberty blockers at Tanner

1 Stage 2 does not categorically prevent endogenous
2 puberty from taking place but instead prevents a
3 substantial portion of endogenous puberty from taking
4 place.

5 Correct?

6 ATTORNEY BLOCK: Objection to form.

7 THE WITNESS: So let me ---.

8 BY ATTORNEY BROOKS:

9 Q. It is in paragraph 17.

10 A. So the --- I guess the way this is understood is
11 --- I guess it depends on how extreme you want to take
12 things. It is back to our original conversation of that
13 cause has to take place before effect. So it's parsing
14 it to that degree.

15 In a biological context it really is the case
16 that we need some objective evidence before we begin
17 things so that we don't make the mistake of using a
18 medication prior to its having any impact. And then
19 it's also true that some of the hormone mediated changes
20 that we see do actually regress to that prepubertal
21 state when we --- when you use puberty blockers at
22 Tanner 2. So the statement as written --- as I wrote it
23 is accurate in the way we think of these things in
24 biology.

1 Q. Although the guidelines specifically state that
2 adolescents should --- before puberty blockers, quote,
3 should experience the first changes of their endogenous,
4 spontaneous puberty. And the recommendation calls for
5 beginning puberty blockers, quote, after girls and boys
6 first exhibit physical changes at puberty, paren, Tanner
7 stages 2, closed paren. I'm not misreading anything, am
8 I?

9 ATTORNEY BLOCK: Objection to just
10 reading an excerpt.

11 THE WITNESS: Right. I don't know --- I
12 don't know if those were are all direct quotes or not so
13 I won't comment on whether you're misreading or not, but
14 the first statement that you reference, as I've said, is
15 one where there is an evolving understanding of its
16 veracity or its applicability.

17 The statement 2.2 is simply using
18 alternate phrasing for saying Tanner 2, that is we need
19 to have objective evidence that puberty is genuinely
20 beginning. The focus and the purpose of these
21 statements is to avoid people using puberty blockers on
22 non-pubertal kids.

23 BY ATTORNEY BROOKS:

24 Q. Well, you would agree with me, would you not,

1 that if one administer puberty blockers in accordance
2 with Endocrine Society guidelines, then some stages of
3 endogenous male puberty will have occurred in natal male
4 patients?

5 ATTORNEY BLOCK: Objection the form.

6 THE WITNESS: So when we are ---
7 specifically we're referencing transgender girls here.
8 And although pre-pubertis gender boys, when we see
9 Tanner 2, then some --- some degree of development has
10 taken place. That part is true. So in the absolute
11 sense, then yes. But in a biological sense, like I said
12 already, the --- some interesting reality is that some
13 of that does regress.

14 BY ATTORNEY BROOKS:

15 Q. By the way, you, yourself, do not have any
16 knowledge as to what developments of endogenous male
17 puberty BPJ underwent prior to initiating puberty
18 blockers, do you?

19 A. I have had no physical contact with BPJ.

20 Q. Nor have you studied BPJ's chart sufficiently to
21 be feel that you know the answer to that question?

22 A. Right, I'm not expressing any opinion to the
23 specific medical terms, that's right.

24 Q. Have you, yourself, ever supervised any

1 research, clinical research, concerning treatment of
2 prepubertal children for gender dysphoria or gender
3 incongruence?

4 A. Have I supervised research on treatment of
5 prepubertal transgender girls? Let me think about that.
6 Nothing is coming to mind, but our program does do
7 research across an age span.

8 Q. Well, some of your colleagues might have done
9 such research, but my question is whether you have been
10 personally supervised or involved in such research?

11 A. I'm pretty involved actually, especially in our
12 research program, but I'm having a difficult time coming
13 up with an example.

14 Q. All right.

15 I just want to make sure I know about it if it
16 exists.

17 A. Yes.

18 ATTORNEY BROOKS: Let me mark as Safer
19 Exhibit 9 an article entitled --- an article or a
20 chapter or something entitled Care of the Transgender
21 Patient dated 2019 by Dr. Safer and by Doctor Vin
22 Tangpricha.

23

24

(Whereupon, Exhibit 9, Care of the

1 Transgender Patient Article, was marked
2 for identification.)

3 ---

4 BY ATTORNEY BROOKS:

5 Q. Am I correct that this is --- well, you tell me,
6 is this an article or book chapter? How would you
7 describe this document?

8 A. This is a review article from the Annals of
9 Internal Medicine.

10 Q. And by review you mean it's not reporting on
11 original research but rather summarizing the state of
12 knowledge in a particular area?

13 A. That is correct.

14 Q. Okay.

15 And the pages may have ITC and a number, but
16 I'll just refer to the number if I may. On page three,
17 column two, is a statement that I think is just
18 repeating what you told me, that is most --- quote, most
19 transgender persons present to clinicians in late
20 adolescence or adulthood, closed quote. That is
21 consistent with what you testified earlier.

22 Correct?

23 A. That is, yes.

24 Q. And if you turn then to page five, column two,

1 you write in the first full sentence in column two,
2 prior effects of androgens on the skeleton height and
3 size and shape of the hands, feet, jaw and pelvis and
4 voice, including visibly --- visible laryngeal
5 prominence, will not be altered if treatment is
6 initiated after puberty.

7 Do you see that language?

8 A. I do.

9 Q. And is it consistent with your understanding
10 that at this stage also changes to the size of the heart
11 and the lungs will not be altered if testosterone is
12 commenced after the initiation of puberty?

13 A. Not quite.

14 Q. Explain that to me, please.

15 A. So transgender women, if they have gone through
16 a typical male puberty, are going to remain larger, but
17 the testosterone has action on certain tissues, so
18 specifically muscle, and that --- when those
19 testosterone levels shrink, then that muscle shrinks and
20 the heart muscle is --- well, the heart is a muscle, so
21 it will be --- there will be an impact from body size,
22 but there will also be impact from the lower level of
23 testosterone. So it will be kind of a mix of those two.

24 Q. The heart is a muscle but it has in it cavities

1 of a certain size in which blood flows, out of which
2 blood is pumped, correct? Do you have any knowledge,
3 are you aware of any literature that documents that
4 testosterone suppression reduces the heart's pumping
5 capacity?

6 ATTORNEY BLOCK: Objection to form.

7 THE WITNESS: So the --- so there is a
8 gap there of transgender research --- so no, that is
9 something that's not been studied.

10 BY ATTORNEY BROOKS:

11 Q. And the lungs are not muscle tissue. Are you
12 aware of any science that indicates or even suggests to
13 you as an expert that an individual who has gone through
14 typical male puberty, that individual's lungs reduce in
15 size if testosterone is suppressed?

16 A. So the answer with regard to lungs is going to
17 have some of those same inputs as heart or other tissues
18 actually where overall size of the individual is not ---
19 well, certainly height at least is not decreasing, and
20 so this person is larger. And so lung size matches that
21 to some degree. And testosterone has some impact on
22 surrounding muscle. And so to the degree that that
23 shrinks there might be lung shrinking too. And so you
24 hear that --- that is going to be a complex answer. And

1 in terms of interpreting it even, you then would also
2 have to interpret it in the context of the size of the
3 body if you want to consider function, and none of this
4 has been studied.

5 Q. Certainly you don't believe, do you, that an
6 individual who has been --- let me start that again. It
7 is not your opinion, is it, that testosterone
8 suppression by an individual who has been through a
9 typical male puberty reduces that individuals VO2 mass
10 to typical female levels?

11 A. So the more we get into some of the subtler
12 physiology, I will take a step back and give you an
13 expert opinion, but I will --- in addition to that point
14 out that we don't even have studies on this. We're just
15 at a stage of beginning to look at that sort of thing.

16 ATTORNEY BLOCK: Roger, are you able to
17 speak up a little?

18 ATTORNEY BROOKS: I will try.

19 BY ATTORNEY BROOKS:

20 Q. You state that in paragraph 55 of your expert
21 report, Exhibit 1?

22 A. So paragraph 55.

23 Q. Fifty-five (55). You state that there are,
24 quote, only two studies examining the effect of

1 gender-affirming hormone therapy on athletic
2 performance, closed quote. Do you see that?

3 A. Yes.

4 Q. You are aware, are you not, that there are a
5 substantially larger number of studies that examine the
6 effect of testosterone suppression on strength or muscle
7 mass in natal males?

8 ATTORNEY BLOCK: Objection to form.

9 THE WITNESS: There are --- there are a
10 handful of studies on the impact of testosterone
11 lowering treatment on transgender women on some tissues,
12 yes.

13 BY ATTORNEY BROOKS:

14 Q. Well --- and not to get carried away with the
15 terminology, there are also studies that relate to
16 application of testosterone suppression to males who
17 don't identify as transgender, are there not?

18 A. To cisgender men in addition to transgender
19 women there are some studies --- yes, there are actually
20 some modest studies, yes, on cisgender men.

21 Q. And have you now taken some care to review
22 yourself all the peer-reviewed studies of that type that
23 were cited in Doctor Brown's report?

24 A. I have looked at papers that were cited by

1 Doctor Brown. The moment we use the word all I
2 hesitate, but certainly I've read through the papers
3 that were cited.

4 ATTORNEY BROOKS: Well, let's start with
5 one you referenced, article by Roberts, et al., from
6 2020, which I will mark as Exhibit --- Safer Exhibit-10.

7 COURT REPORTER: 10.

8 ATTORNEY WILKINSON: 10, Tab 60.

9 ---

10 (Whereupon, Exhibit 10, Roberts, et al,
11 Articles, was marked for
12 identification.)

13 BY ATTORNEY BROOKS:

14 Q. And in fact, this is one of only very few
15 articles that you cite in your expert report start to
16 finish.

17 Correct?

18 ATTORNEY BLOCK: Objection to form.

19 THE WITNESS: So this paper is referenced
20 to an expert report.

21 BY ATTORNEY BROOKS:

22 Q. Let me direct you to the last page of your
23 expert report where there is a bibliography. And other
24 than citing to your own writings as the entire basis of

1 your opinions you cited only six articles.

2 Correct?

3 ATTORNEY BLOCK: Objection to
4 characterization about its entire cases for his
5 opinions.

6 THE WITNESS: So the paper specifically
7 referenced two reviews and six papers but recognized
8 that some of these papers specifically are summaries of
9 the topic.

10 BY ATTORNEY BROOKS:

11 Q. You have studied the Roberts 2020 article with
12 some care.

13 Is that correct?

14 A. I have indeed, yes.

15 Q. And so far as you know it is the only
16 longitudinal study of the impact of testosterone
17 suppression in natal males and actual athletic
18 performance and in this case running.

19 Correct?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: So the Roberts study and
22 the Harper study are both studies of transgender women
23 with at least two time points.

24 BY ATTORNEY BROOKS:

1 Q. The Harper study is strictly retrospective, it
2 is not a prospective, longitudinal study?

3 A. The Harper study is --- that's a good question.
4 I actually don't know if it is --- it's probably mixed,
5 honestly.

6 Q. Well, we can look at it, but it is not mixed.
7 It is a one-time survey.

8 A. Well, to be clear, the way we phrase these
9 things sometimes are --- I'm trying to be --- are
10 according to certain conventions academically, so that
11 sometimes it will be framed that way because from an
12 academic perspective we'll use that context, but I think
13 some of the data was actually collected in both
14 collections.

15 Q. The Roberts study you understand to be a
16 prospective, longitudinal study, do you not?

17 A. Well, actually, you are testing me on that. Did
18 they set out at the beginning to do it or did they go
19 back and look? I'd have to see.

20 Q. Well, based on the method, I think the answer is
21 they went back and looked because it begins we reviewed?

22 A. Yes.

23 Q. Do you --- is it your opinion that amongst the
24 available data, the Roberts study is --- on the impact

1 of testosterone on athletic performance is some of the
2 strongest data that we have available?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: It is my opinion that the
5 Roberts and Harper studies are the only two studies that
6 we have available.

7 BY ATTORNEY BROOKS:

8 Q. Is it your opinion as an expert, is it not, that
9 the structure of the Roberts study renders it --- and
10 the source of its data renders it far more reliable than
11 the Harper 2015 study?

12 ATTORNEY BLOCK: Objection to form.

13 THE WITNESS: I would not overstate that,
14 so no. If I'm being --- if I'm being professorial and
15 saying this is how to organize something, then in that
16 context I might say that, but in terms of simply
17 believability of data, I got two modest papers that are
18 the sum of the world literature on the subject.

19 BY ATTORNEY BROOKS:

20 Q. You say in paragraph 56 of your report that
21 Roberts found, quote, after two years of
22 gender-affirming hormone therapy transgender women
23 completed the 1.5 mile run 12 percent faster on average
24 than non-transgender women, closed quote. Do you see

1 that?

2 ATTORNEY BLOCK: I think he needs some
3 time to get ---.

4 THE WITNESS: Yeah, to actually find
5 the ---.

6 BY ATTORNEY BROOKS:

7 Q. Paragraph 56. And I will refer you to the third
8 sentence.

9 A. All right.

10 Sorry say that again.

11 Q. I'm simply calling your attention to the place
12 where you wrote at the Roberts report that after two
13 years of a gender-affirming hormone therapy transgender
14 women completed the 1.5 mile run 12 percent faster on
15 average than non-transgender women.

16 A. Yes.

17 Q. And two years, not a trick question here, twice
18 as long as the one year testosterone suppression
19 requirement that led to the NCAA rule.

20 Correct?

21 A. Two years is twice one year, yes.

22 Q. And you would agree with me that a 12 percent
23 faster in women's time is a substantial advantage?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: So this is a bit --- this
2 is a bit of the same conversation. I guess I can't say
3 that in a blanket way. It depends on context.

4 BY ATTORNEY BROOKS:

5 Q. The context here is that that these are all Air
6 Force members, do you recall?

7 A. I believe they are all Air Force members, yes.

8 Q. All subject to Air Force physical fitness
9 requirements. So we are not talking about couch
10 potatoes?

11 A. I'm not rendering an opinion there as an expert.

12 Q. Generally you would accept that this is a
13 relatively fit population?

14 A. I can't even render an opinion there as an
15 expert.

16 Q. Do you have some unhealthy relative who's a
17 member of the armed forces?

18 A. I was in the National Guard, so I do have some
19 insight.

20 Q. Okay.

21 You would agree, would you not, that running
22 speed and endurance, per se, are relevant to quite a
23 number of sports?

24 A. Running speed and endurance are relevant to many

1 sports. I'm certain that is true. I'm not ---

2 Q. Well ---.

3 A. --- an expert again.

4 Q. I'm no sports fan, but we've all seen enough
5 sports to know there's a lot of running involved not
6 just in track but in basketball, soccer, lacrosse and
7 field hockey.

8 Correct?

9 A. I have observed that, yes. But again, I'm not
10 rendering an expert opinion there, but yes.

11 Q. And on page six of this paper ---.

12 A. This is Roberts.

13 Q. Yes, Roberts and Exhibit 10. Roberts and his
14 co-authors summarize in their conclusion by stating,
15 quote, in this study we confirm that the use of gender
16 affirming hormones are associated with changes in
17 athletic performance and demonstrated that the
18 pretreatment differences between a transgender and a
19 cisgender woman persist beyond the 12-month time
20 currently --- requirement currently being proposed for
21 athletic competition by the World Athletics and the IOC.
22 Do you see that?

23 A. This is the conclusion section?

24 Q. It is.

1 A. Yes, I see that.

2 Q. And you don't have any expert opinions that the
3 findings of Roberts are inaccurate or unreliable, do
4 you?

5 A. So the --- this is again a question of context.
6 So I have no reason to suspect that these data are
7 suspect. The only question then is what we conclude
8 when you do a study of --- for the transgender women I
9 think we are talking about 29 people, which I certainly
10 like a lot better than simply pointing to a random
11 individual, but I recognize as also simply 29
12 individuals in a certain circumstance that might or
13 might not be replicated as we do this again and increase
14 the numbers of people that we evaluate.

15 Q. You don't propose to offer any expert opinion
16 that the findings of Roberts as reported in this paper
17 of 2020 are inaccurate?

18 A. So, I guess the way I said it is how I said it
19 already, which is I'm not doubting Roberts' data, but I
20 wouldn't then over generalize to say that I know that
21 these would be the findings we would see in every
22 similar circumstance.

23 Q. And are you aware that one common track event or
24 cross-country event, I can never keep them straight, is

1 the 1600 meter, which is about a mile?

2 A. Actually, that is not my expertise. I believe
3 you.

4 Q. Are you aware that the 3,000 meter, a 1.8 mile
5 distance, is a standard event?

6 A. If you are meaning to quiz me on the standard
7 lengths these days and meters and all of that, no.

8 ATTORNEY BROOKS: Well, I can't complete
9 my next document in two minutes, we if we want to break
10 at 1:00 now or I can do one more document.

11 ATTORNEY BLOCK: I'm fine continuing if
12 you are.

13 THE WITNESS: My bias is to push.

14 ATTORNEY BROOKS: Folks online, we're
15 going to continue a little bit farther.

16 BY ATTORNEY BROOKS:

17 Q. You cited a paper by Harper from 2015. And that
18 paper also I take it you studied with some detail?

19 A. Yes.

20 Q. And how many individuals did Harper have in that
21 study?

22 A. I --- do we have her ---?

23 Q. Everything that you mention I have.

24 ATTORNEY BROOKS: Let me mark as Safer

1 Exhibit 11 ---

2 ATTORNEY WILKINSON: Yes.

3 ATTORNEY BROOKS: --- Harper's --- Harper
4 et al. or just Harper, article Race Times for
5 Transgender Athletes from 2015.

6 ATTORNEY WILKINSON: Tab 61.

7 ---

8 (Whereupon, Exhibit 11, Race Times for
9 Transgender Athletes Article, was marked for
10 identification.)

11 ---

12 THE WITNESS: Thank you.

13 BY ATTORNEY BROOKS:

14 Q. You say you have worked with Joanna Harper, you
15 are aware that Dr. Harper is both an athlete and
16 transgender?

17 ATTORNEY BLOCK: Objection to form.

18 THE WITNESS: I am aware. I am aware
19 that she is an athlete, and I'm aware that she is
20 transgender.

21 BY ATTORNEY BROOKS:

22 Q. Did you have after studying the paper end up
23 with an understanding of how many participants there
24 were?

1 A. There were eight participants. I'm looking at
2 Table 5.

3 Q. Did you have an understanding of how those
4 participants were recruited?

5 A. I do have some understanding of that, yes.

6 Q. How is that?

7 A. The --- how would I characterize this? It's
8 somewhat ad hoc in the sense that Ms. Harper is in the
9 category of these other participants, and so she was
10 able to identify others that met the criteria of being
11 both transgender and being sufficiently intense in their
12 middle distance running that they had race times that
13 they could identify that would allow for the --- for
14 these determinations of age based --- I don't know all
15 the terminology here, but their age-based grade
16 proportional to others in that same sex category.

17 Q. And it is consistent with your understanding, is
18 it not, that all of the information in this study about
19 what hormonal treatment these individuals had undergone
20 was self reported?

21 A. This is --- the entire study is self report,
22 that is she didn't have --- Ms. Harper did not have
23 access to people's individual records independently.

24 Q. So there was no independent confirmation of how

1 long that they had suppressed testosterone.

2 Correct?

3 A. There was no independent confirmation beyond Ms.
4 Harper and her dealing with other subjects directly.

5 Q. Well, in your view as a scientist, that's not
6 independent confirmation, is it?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: So I'm not expressing an
9 opinion there because in a science --- you know, in a
10 scientific paper we would have --- we would have peer
11 review, but we don't --- that just --- ends up being a
12 little bit of a fuzzy realty.

13 BY ATTORNEY BROOKS:

14 Q. There is no information in this paper about what
15 testosterone levels were achieved by any of these
16 individuals as a result of suppression, is there?

17 A. I don't know. Let's --- I can look through that
18 a little bit because does she reference how many of them
19 have had surgery and such? It has been quite a while,
20 you know. So notably, there is some independent
21 confirmation of some of the data because some of this
22 was posted.

23 Q. Wait. Let me just be clear. Some of the times
24 were verified independently.

1 Correct?

2 A. That's correct.

3 Q. Nothing about the hormonal treatment?

4 A. Right.

5 ATTORNEY BLOCK: Do you want to give him
6 a chance to review it?

7 BY ATTORNEY BROOKS:

8 Q. Doctor Safer, let me just withdraw that question
9 and ask you another question.

10 A. Yeah, go ahead.

11 Q. Do you know whether Doctor Harper stands behind
12 the conclusions of her 2015 paper today?

13 A. If you ask me do I know it, that's too strong a
14 statement.

15 ATTORNEY BROOKS: Let me mark as Safer
16 Exhibit 12 an article by Joanna Harper and others from
17 2021 entitled How Does Hormone Transition in Transgender
18 Women Change Body Composition, Muscle Strength and
19 Hemoglobin.

20 ATTORNEY WILKINSON: Tab 21.

21 ---

22 (Whereupon, Exhibit 12, Joanna Harper
23 Article, was marked for identification.)

24 ---

1 BY ATTORNEY BROOKS:

2 Q. Dr. Safer, have we put that in front of you?
3 Yes, we have. Are you familiar with this article?

4 A. I am.

5 Q. And have you read it, reviewed it recently?

6 A. I have reviewed it relatively recently.

7 Q. And do you understand, and I didn't completely
8 read the title. The second sentence of the title says
9 Systematic Review with the Focus on Implications for
10 Sport Participation.

11 Do you see that?

12 A. I do.

13 Q. Can you tell me why when you cited Harper's 2015
14 paper that you just referred to as older science you
15 didn't cite Harper's 2021 publication?

16 A. So to be clear, I didn't use the older science.
17 I simply referenced Harper's paper as one of the only
18 two papers on the subject. And your question?

19 Q. Why didn't you cite Harper's 2021 paper on the
20 topic?

21 A. So this paper is more in the category of the
22 papers looking at impact on tissues of which there are
23 several papers as opposed to actually investigating a
24 specific activity, a person's activity. And does this

1 have primary data in it?

2 Q. Well, let me take you to page eight.

3 A. Yeah, I don't even think this has a final data
4 in it.

5 Q. Describing the Roberts study, Harper here on
6 page eight, column one, about halfway down, summarizes
7 as follows: Quote, trans women ran significantly faster
8 during the 1.5 mile fitness test than ciswomen. These
9 observations in trained transgender individuals are
10 consistent with the finding of the current review in
11 untrained individuals whereby 30 months of gender
12 affirming hormone therapy maybe sufficient to attenuate
13 some but all influencing factors associated with
14 muscular endurance and performance, closed quote.

15 Do you see that?

16 A. Yes. This is the end of the paragraph there?

17 Q. Yes.

18 A. We're starting with these observations, yes, I
19 see that.

20 Q. And do you propose to offer any expert opinion
21 inconsistent with Joanna Harper's summary of the data
22 here suggesting that 30 months of gender affirming
23 hormone therapy may be sufficient to attenuate some but
24 not all influencing factors associated with muscular

1 endurance and performance?

2 A. The statement here is too broad, so it's simply
3 raising questions.

4 Q. Well, Joanna Harper says here that the findings
5 of her current review were that 30 months of gender
6 affirming hormone therapy may be sufficient to attenuate
7 some but not all influencing factors associated with
8 muscular endurance and performance?

9 ATTORNEY BLOCK: Objection to leaving out
10 words of what you quoted.

11 BY ATTORNEY BROOKS:

12 Q. And my question for you is do you intend to
13 offer an expert opinion that you believe is inconsistent
14 with that statement?

15 ATTORNEY BLOCK: Same objection. It's
16 misquoting the document.

17 THE WITNESS: So the operative or
18 inoperative word here is may be sufficient, and so when
19 we're --- these are research questions as we try to
20 understand physiology and the relevance of certain
21 testosterone levels at certain endpoints and then not
22 just endpoints as surrogates, which is what most of the
23 papers to date still are, but endpoints in actual
24 athleticism and athletic competition. And so that's all

1 this is doing is putting out some questions or some
2 potential thoughts.

3 BY ATTORNEY BROOKS:

4 Q. Let me ask you to turn to page one and column
5 one.

6 A. Of this same paper?

7 Q. Of the same paper. In the conclusion of the
8 abstract the last sentence reads, quote, these findings
9 suggest the strength may be well be preserved in trans
10 women during the first three years of hormone therapy,
11 closed quote.

12 Do you see that?

13 A. I do.

14 Q. And having reviewed whatever literature you have
15 reviewed to date do you share Doctor Harper's
16 understanding that strength may well be preserved in
17 trans women during the first three years of hormone
18 therapy?

19 ATTORNEY BLOCK: Objection to misquoting
20 the document.

21 THE WITNESS: So I can't comment on Ms.
22 Harper's understanding, but if you're asking is that ---
23 you know, is the question a question, so the question is
24 a question. These findings suggest that strength may

1 and again an operative word is may.

2 BY ATTORNEY BROOKS:

3 Q. Yes.

4 A. And these are as I, a scientist, and she is a
5 scientist too, we are turning the earth, as it were, of
6 what we know looking for what questions we might want to
7 study and how we might want to frame studies going
8 forward.

9 Q. Let me take you back to page eight, if I may.
10 And the penultimate sentence of this paper at the bottom
11 of the first column of paragraph of page eight reads,
12 quote --- well, let me read --- yeah, I will just read
13 that, quote, whether transgender and cisgender women can
14 engage in meaningful sport even after gender affirming
15 hormone therapy is a highly debated question, closed
16 quote.

17 Do you see that language?

18 A. I do.

19 Q. You'll agree that up to the present that is a
20 highly debated question?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: There's context there too.

23 So this is referencing a league sport and it's --- as
24 well there are a range of potential sports, and so the

1 question and the degree to which it is highly debated
2 even I'm not going to render an official opinion there.
3 So the --- whether transgender and cisgender women can
4 engage in meaningful sport depends on what sport we're
5 talking about, what treatment we're talking about, age
6 group, whether elite versus more of an intermural
7 setting. And so it's just a relatively simple statement
8 and to summarize a paper I guess.

9 BY ATTORNEY BROOKS:

10 Q. You agree that this --- that is the question of
11 whether transgender and cisgender women can engage in
12 meaningful sport even after gender affirming hormone
13 therapy is one on which reasonable scientists can
14 disagree and today are disagreeing?

15 ATTORNEY BLOCK: Objection to form.

16 THE WITNESS: So going back --- so is
17 your --- so are you asking me --- I guess help me
18 reframe what the question is there because there are a
19 bunch of things packed into that sentence actually. And
20 you heard me try to unpack them both.

21 BY ATTORNEY BROOKS:

22 Q. That may be a complex question, as debated
23 questions often are, but my question is do you agree
24 that the question of whether transgender and cisgender

1 women can engage in meaningful sport even after gender
2 affirming hormone therapy is one on which reasonable
3 scientists can differ and are differing today given the
4 possibility of data?

5 ATTORNEY BLOCK: Objection to form for
6 the same reasons.

7 THE WITNESS: So I'm sitting here as a
8 scientist talking about differences in athleticism and
9 such and whether --- and so moving onto meaningful sport
10 goes beyond my expertise. I'm only putting data
11 together in a --- that's my lane on this subject.

12 ATTORNEY BROOKS: Okay.

13 Let's break for lunch.

14 ATTORNEY BLOCK: Let's go off the record,
15 so 2:15.

16 ATTORNEY BROOKS: 2:15? Any dissent? No
17 dissent.

18 VIDEOGRAPHER: Going off the record. The
19 current time is 1:16 p.m. Eastern Standard Time.

20 OFF VIDEOTAPE

21 ---

22 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

23 ---

24 ON VIDEOTAPE

1 VIDEOGRAPHER: Back on the record. The
2 current time is 2:18 p.m. Eastern Standard Time.

3 BY ATTORNEY BROOKS:

4 Q. Good afternoon, Dr. Safer. Take you back into
5 context, I'm going to ask you to find your expert
6 report, Exhibit-1, and find paragraph 25, which we have
7 looked at before. And there in the third sentence it
8 reads based on current research comparing
9 non-transgender boys and men with non-transgender girls
10 and women before, during and after puberty the primary
11 known biological driver of these average group
12 differences is testosterone starting at puberty, and not
13 reproductive biology or genetics, period, closed quote.

14 Do you see that language?

15 A. Yes.

16 Q. And your one cite for that is the endocrine that
17 we've already looked at already.

18 Right?

19 ATTORNEY BLOCK: Objection to the form.

20 THE WITNESS: So the citation in that
21 paragraph is the Handelsman, yes.

22 BY ATTORNEY BROOKS:

23 Q. And do you recall our earlier discussion about
24 how the effects of testosterone are cumulative over time

1 rather than depending solely on the testosterone level
2 of an individual at a particular time, right? Do you
3 recall that discussion?

4 A. So the impact --- excuse me, the impact of
5 testosterone is cumulative. It depends what impacts
6 we're talking about. So there are impacts that are
7 cumulative, like height, and there are impacts that
8 really do reflect that point in time.

9 Q. Now, at the moment let me ask just based on your
10 recollection. The Handelsman article is Exhibit-4. Do
11 you have that? And I will ask you to find it in your
12 pile. I should have neated up your pile of exhibits
13 while you were out. That looks like it.

14 A. Got it, yes.

15 Q. The Handelsman article, as far as you recall,
16 does not contain any data or conclusions concerning the
17 effects of testosterone after the beginning of male
18 puberty, does it?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: Honestly, I would have to
21 go look carefully.

22 BY ATTORNEY BROOKS:

23 Q. Then I won't take time to do that.

24 A. Okay.

1 Q. It does or it doesn't. We will deal with that.

2 A. Yes.

3 Q. Do you know whether any other writing Professor
4 Handelsman has expressed any view as to whether
5 testosterone suppression after male puberty eliminates
6 sex-based physical advantages sufficiently to maintain
7 fairness in sports for women?

8 ATTORNEY BLOCK: Objection to the form.

9 THE WITNESS: So first of all, putting it
10 altogether that way isn't necessarily how I would say it
11 or how I would expect it to be said. It would be
12 testosterone suppression and whatever the scientific
13 finding at the moment would be. So we already know that
14 the data that relate to athleticism are just the Roberts
15 paper and the Harper paper, so I guess that is as much
16 as I can say in that particular context. And in terms
17 of --- so yes, I think that it wouldn't be --- I forgot
18 already how you phrased that.

19 BY ATTORNEY BROOKS:

20 Q. Let me just ask again.

21 A. Yes.

22 Q. So the first question is not a hard one.

23 A. Okay.

24 Q. Do you know whether Professor Handelsman has

1 himself in his publication expressed any view whether
2 testosterone suppression after male puberty eliminates
3 sex-based physical advantages sufficiently to maintain
4 fairness in sports for women?

5 ATTORNEY BLOCK: Objection to form.

6 THE WITNESS: So I don't know if he has
7 written something covering all those bases that you just
8 described, how you described it.

9 ATTORNEY BROOKS: All right. Let's look
10 at treatment variable. Let me mark as Exhibit 13 a
11 short article by Dr. Roberts with a subsequent comment
12 by David Handelsman.

13 ATTORNEY WILKINSON: Tab 62.

14 ATTORNEY BROOKS: And unfortunately, the
15 words were a little clipped on this. We will see how we
16 do.

17 ---

18 (Whereupon, Exhibit 13, Dr. Roberts Article, was
19 marked for identification.)

20 ---

21 ATTORNEY BLOCK: Thanks.

22 BY ATTORNEY BROOKS:

23 Q. And I think a fair description of what we have
24 here is a relatively popular press type piece by Dr.

1 Roberts first. And this document is dated December 16,
2 2020.

3 ATTORNEY BLOCK: Objection. Does it say
4 where it was published?

5 ATTORNEY BROOKS: No, it doesn't say on
6 its face where it was published. And as we sit here
7 right now I don't recall, though actually looking at it
8 I do recall that Kilio is an online publication of some
9 sort, and I've seen the brand came from the Kilio
10 website.

11 BY ATTORNEY BROOKS:

12 Q. At any rate, I see the date, I see the title.
13 It purports to be an article by Professor Roberts. I
14 just want to be clear in my description it does not ---
15 it does not have the appearance of a separate peer
16 review article since the summary taken off of the
17 article that we've already looked at. And then at the
18 end of it is a two-paragraph prospective on this offered
19 by Dr. Handelsman.

20 Do you see that?

21 A. I do.

22 Q. And he begins by making clear that he is
23 commenting on this study, that is Roberts study that is
24 discussed above. He is not introducing new science,

1 correct, is that consistent with your understanding?

2 ATTORNEY BLOCK: Objection. Give him a
3 chance to read it.

4 THE WITNESS: So that, yes, my
5 understanding, too, is that there is not new data here,
6 mostly a commentary within the context some of our
7 existing knowledge on the Roberts study.

8 BY ATTORNEY BROOKS:

9 Q. And in his comment to Dr. Handelsman states in
10 the second paragraph, as of 2020, quote, a major
11 question remains whether gender affirming hormone
12 treatment overcomes sex-based physical advantages
13 sufficiently to maintain fairness so that an exception
14 can be made for trans women, paren, natal males, closed
15 paren, treated with estrogen.

16 Do you see that language?

17 A. I do.

18 ATTORNEY BLOCK: Objection. I believe
19 that is what it says, but I just want to note for the
20 record that there is text cut off on the left.

21 ATTORNEY BROOKS: There is. And I'll get
22 better copies. I'm looking at a copy that's not cut off
23 I will represent.

24 BY ATTORNEY BROOKS:

1 Q. And do you have an expert opinion as to ---
2 well, do you propose to offer any opinion disagreeing
3 with Professor Handelsman that as of 2020 it remained a
4 major question whether gender affirming hormone
5 treatment to overcome sex-based physical advantages
6 sufficiently to maintain fairness so that an exception
7 could be made for trans women treated with estrogen?

8 A. So to me that's too broad a question if you're
9 asking me to render an expert opinion about his opinion.

10 Q. I'm asking whether you propose to offer an
11 expert opinion inconsistent with his view that remains a
12 major question as of 2020.

13 A. It's --- I might --- well, I would at least
14 phrase things differently in there --- we might have to
15 go through pieces of it because certainly where we lack
16 data I think we would agree, but in terms of those
17 statements that then go on to editorialize, I don't know
18 that we necessarily agree in how we would frame that.

19 Q. A little farther down, maybe two sentences down
20 it reads, quote, by contrast, trans women treated with
21 estrogens after completing male puberty experienced only
22 minimal declines in physical performance over 12 months,
23 substantially surpassing average female performance for
24 up to eight years, closed quote. Do you agree or

1 disagree with Professor Handelsman summary of the
2 findings of Roberts?

3 ATTORNEY BLOCK: Objection to form. I'm
4 just not sure it's all based on Roberts?

5 THE WITNESS: It is not clear to me that
6 it's --- that it is based on Roberts for what it's
7 worth. It's also somewhat simplistically written. And
8 an example is we don't --- the contention with regard to
9 athletic outcomes relates more to testosterone, and so
10 saying transgender women treated with estrogens wouldn't
11 be precisely how I would frame that either.

12 BY ATTORNEY BROOKS:

13 Q. He concludes --- Professor Handelsman concludes
14 by stating supporting federations should incorporate
15 these findings in the strategies for including trans
16 women in elite female competitions while maintaining
17 fairness and safety for other women. Dr. Safer, do you
18 agree that maintaining safety for cisgender women is a
19 legitimate and indeed important concern?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: As an expert I'm not going
22 to give an opinion.

23 BY ATTORNEY BROOKS:

24 Q. As Doctor Safer do you agree that ensuring

1 safety for cisgender women and girls is a legitimate
2 concern?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: So if I'm simply speaking
5 not as an expert, just as an educated person in the
6 field, then it is true that safety is important, but I'm
7 not clear that --- I don't know that in most of these
8 athletic activities it's actually a concern.

9 ATTORNEY BROOKS: Let me mark as Safer
10 Exhibit 14 a document entitled Guidance with Transgender
11 Inclusion in Domestic Sport with symbols of a number of
12 UK sport governing bodies across the front and a
13 statement published September 2021.

14 ATTORNEY WILKINSON: Tab 22.

15 ---
16 (Whereupon, Exhibit 14, Guidance with
17 Transgender Inclusion in Domestic Sport,
18 marked for identification.)

19 ---
20 THE WITNESS: Thank you.

21 BY ATTORNEY BROOKS:

22 Q. And my first question for you, Dr. Safer, is
23 whether you have seen this document before?

24 A. I have seen this document before.

1 Q. And were you aware of it prior to its reference
2 in this litigation?

3 A. I don't know that I was.

4 Q. And are you familiar with the role of the
5 supporting body mentioned on the front page in
6 governance of sport within the United Kingdom?

7 A. By looking at all their logos, I cannot say that
8 I know them all, no.

9 Q. And do you have any knowledge as to whether
10 these are official government chartered --- chartered
11 sporting governing bodies?

12 A. I do not have that knowledge.

13 Q. Have you now studied this document with some
14 care?

15 A. I would say that I have only looked at this
16 document superficially. I'm certainly happy to look
17 through it.

18 Q. I will ask you just about a couple of passages.
19 Let me ask you to turn to page three of the document.
20 And towards the very bottom and the next to the last
21 paragraph this --- five organizations states, quote, our
22 work exploring the latest research, evidence and studies
23 made clear that there are retained differences in
24 strength, stamina and physique between the average women

1 compared with the average transgender women for
2 nonbinary person registered male at birth with or
3 without testosterone suppression.

4 Do you see that language?

5 A. I do.

6 Q. And do you disagree with the conclusion of these
7 UK sporting bodies that the latest research, evidence
8 and studies now make clear that there are retained
9 differences in strength, stamina and physique in
10 nonbinary --- in transgender women or nonbinary persons
11 registered male at birth with or without testosterone?

12 ATTORNEY BLOCK: Objection to referring
13 to this as something written by the governing bodies as
14 opposed to the quality council that makes
15 recommendations to the governing bodies.

16 THE WITNESS: To the statement written by
17 whoever actually wrote it that evidence and studies on
18 the subject of transgender people make clear anything, I
19 disagree.

20 BY ATTORNEY BROOKS:

21 Q. Let me ask you to turn to page six, under the
22 heading question review is recommending it states,
23 quote, as a result of what the review found the guidance
24 concludes that the inclusion of transgender people into

1 female sport cannot be balanced regarding transgender
2 inclusion, fairness and safety in gender affected sport
3 where there is meaningful competition, period, closed
4 quote.

5 Do you see that?

6 A. I do.

7 Q. And do you disagree with that conclusion of this
8 organization or these organizations?

9 A. So I really --- as we discussed earlier, I'm not
10 going to express as an expert --- I don't think I'd be
11 able to express as an expert fairness and so I can't
12 comment any further.

13 Q. Let me ask you to turn to page nine in your
14 expert report, paragraph 49.

15 A. Okay. Paragraph 49.

16 Q. At the end of paragraph 49 you state, quote, a
17 person's genetic makeup and internal and external
18 reproductive anatomy are not useful indicators of
19 athletic performance and have not been used in elite
20 competition for decades. In making that statement when
21 you refer to a person's genetic makeup were you
22 referring to the question of whether they had XX or XY
23 chromosomes?

24 A. So when I'm making the statement genetic makeup

1 I'm heavily referencing chromosomes. So I guess I would
2 say that is mostly correct with some --- with perhaps
3 some known genes, but mostly chromosomes.

4 Q. You would agree, would you not, that respected
5 voices in the field take the view that genetic sex it is
6 at least an important determinant of athletic
7 performance, do you not?

8 ATTORNEY BLOCK: Objection to form.

9 THE WITNESS: So that I'm supposed to
10 comment that there are people in the field who say that?
11 I guess what I would say is the consensus right now
12 among medical people advising elite athletic
13 organizations would be to move away from using that as a
14 surrogate. In the past it was. There were chromosome
15 tests and the problem is that people have --- there is
16 quite a bit of variety in biology and of course the
17 moment you make a rule you see the exceptions.

18 BY ATTORNEY BROOKS:

19 Q. The exceptions.

20 A. And so I would say that as an expert I can't
21 comment in terms of, you know, some study of everybody's
22 opinion or some survey. But as somebody who has been on
23 these committees I've observed that that was discarded.

24 Q. So if you put alongside individuals who suffer

1 from any condition that has been identified as a
2 disorder of sexual development, am I correct that you
3 consider yourself to have expertise in what constitutes
4 a disorder of sexual development?

5 A. I have some expertise. And the terminology is
6 actually differences of sexual development or sexual
7 differentiation or intersex are the terms that are more
8 popularly used.

9 Q. You would agree with me, would you not, that
10 many respective sources up to the present would continue
11 to refer to disorders of sexual development?

12 ATTORNEY BLOCK: Objection to form.

13 THE WITNESS: So there --- what I would
14 say there is that --- the newer terminology has not ---
15 has not yet permeated because there have not been
16 revisions to all the documents that have been created.

17 BY ATTORNEY BROOKS:

18 Q. How about if we say DSD?

19 A. DSD is a reasonably safe or DSD intersex is what
20 some people do, yes.

21 Q. Well, not all DSDs would be considered intersex
22 conditions.

23 Correct?

24 A. You are right that some people try to parse

1 those two terms even. And there is --- but I think
2 those kinds of distinctions might be on the scope of
3 what we are discussing.

4 Q. Probably so. If we put on side individuals who
5 suffer from anything that is characterized in the field
6 as a DSD you would agree, would you not, that genetic
7 makeup and specifically whether the individual possesses
8 XX or XY chromosomes is a statistically meaningful
9 indicator of athletic performance?

10 ATTORNEY BLOCK: Objection to form.

11 THE WITNESS: So no, and the --- it's ---
12 I guess it depends what you mean is what it comes down
13 to. So if you are --- if you are simply saying, well, a
14 certain fraction of people of these chromosomes are
15 going to be --- have this other characteristic, then
16 maybe there are those kinds of associations. But if you
17 are going to say that it's connected to the point where
18 you could actually use one of those let's say observing
19 a chromosome as an actual determination for a given
20 individual, then I would say no.

21 BY ATTORNEY BROOKS:

22 Q. Is it your opinion that a gender identity itself
23 is a --- or useful indicator of athletic performance?

24 A. It is my opinion that gender identity itself is

1 not a useful indicator of athletic performance.

2 Q. You say at paragraph 44 of your report --- I
3 will save that. I think that is a new Declaration and
4 we will not take time to do that.

5 Let me ask you to look at paragraph 24 of your
6 rebuttal report. You say in paragraph 24 that none of
7 Doctor Carlson's arguments support HB-3293 categorical
8 ban of all girls who are transgender from all girls
9 sports teams.

10 Do you see that?

11 A. I do.

12 Q. And I should continue. I'm sorry. Doctor
13 Carlson's safety argument relates solely to contact and
14 collision sports and the physical characteristics
15 developed during puberty, period. By referring to a
16 categorical ban let me ask this. Do you agree that
17 safety considerations could justify or may justify
18 excluding natal males who experienced all or significant
19 part of male typical pubertal development from
20 participating in female division of contact or collision
21 sports such as basketball and soccer?

22 ATTORNEY BLOCK: Objection to form.

23 THE WITNESS: So if the question is would
24 I anticipate as an expert that there would be a safety

1 explanation for banning transgender women from the
2 female category, then I would --- I wouldn't --- I
3 certainly --- let me think about which way to phrase it.
4 I would have a hard time coming up with an example where
5 I would use being transgender as a safety criterion as
6 opposed to body habitus size or some other more
7 objective criterion.

8 BY ATTORNEY BROOKS:

9 Q. Well, and I didn't say anything about gender
10 status. Let me ask again. Would you agree that safety
11 considerations could justify excluding natal males who
12 have experienced all or a significant part of male
13 typical pubertal development from participating in
14 female division contact and collision sports such as
15 basketball or soccer?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: So you're saying that even
18 if we otherwise decided that it would be okay for
19 cisgender males to play with cisgender females, would I
20 envision there being a safety reason to ban those
21 cisgender males?

22 BY ATTORNEY BROOKS:

23 Q. All I asked had nothing to do with gender
24 identity. Do you agree that the introduction onto the

1 field or the court in or have been spoken of its contact
2 or collision sports in the female division of natal
3 males who have gone through all or a significant part of
4 male typical pubertal development could raise legitimate
5 concerns about safety for the natal females?

6 ATTORNEY BLOCK: Same objections as the
7 previous two questions.

8 THE WITNESS: So any person who's gone
9 through a male puberty would that, per se, make me
10 invoke a safety concern, if that's the question ---.

11 BY ATTORNEY BROOKS:

12 Q. Could that in your mind raise the given safety
13 concerns?

14 A. So I would not --- the word legitimate I'm not
15 addressing, but I'm not aware of that in and of itself
16 being a safety concern.

17 Q. You state in paragraph 22 of your rebuttal
18 report that, quote, transgender athletes and women have
19 been competing in NCAA and secondary school athletics
20 for many years at this point. Let me ask you if you are
21 aware of any instance in which natal males have competed
22 in the female category in any contact or collision sport
23 in either the NCAA or high school division?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: So can I identify
2 transgender girls or women specifically and specific
3 instances of participation? I cannot.

4 BY ATTORNEY BROOKS:

5 Q. What was your basis for asserting that such
6 athletes have been competing in the NCAA and secondary
7 school athletics for many years?

8 ATTORNEY BLOCK: I'm sorry. Is the
9 question about collision sports? Because you are
10 quoting something that is not about collision sports.

11 ATTORNEY BROOKS: Let me break that out.
12 Thank you.

13 BY ATTORNEY BROOKS:

14 Q. Do you have a view as to whether --- I shouldn't
15 say a view. Do you have any information as to whether
16 transgender athletes have been competing in the women's
17 division of NCAA or secondary school athletics in any
18 contact or collision sports for many years?

19 A. That information on the validity is that they
20 have had access because there has not been a ban.

21 Q. But whether they have done so you do not have
22 any information?

23 A. But I cannot point to specific instances,
24 exactly.

1 Q. I apologize if I asked something early in the
2 morning, but it's faster than trying to dig back into
3 the transcript. Do you have any opinion as to whether
4 it is reasonable to exclude a natal male with a male
5 gender identity from a high school girls basketball
6 team?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: So ask that again a little
9 bit slower.

10 BY ATTORNEY BROOKS:

11 Q. Do you have have any opinion as to whether it is
12 reasonable to exclude a natal male with a male gender
13 identity from participation in a girls high school
14 basketball team?

15 ATTORNEY BLOCK: Objection.

16 THE WITNESS: I do not have an expert
17 opinion on that subject.

18 BY ATTORNEY BROOKS:

19 Q. Do you have a personal view?

20 A. I don't know that I --- there it would get more
21 complicated depending on context.

22 Q. You don't have a simple yes or no personal view
23 on that question?

24 A. I don't.

1 Q. And do you have a view whether it is reasonable
2 to exclude a natal male with a female gender identity
3 from participation in a high school girls basketball
4 team?

5 ATTORNEY BLOCK: Objection to form.

6 THE WITNESS: So do I have a view on
7 participation of a cisgender girl in the girls category?
8 Sorry. Say it again.

9 BY ATTORNEY BROOKS:

10 Q. I said do you have a view on whether it is
11 reasonable to exclude a natal male with a female gender
12 identity from participation in the high school girls
13 basketball team?

14 ATTORNEY BLOCK: Objection to form.

15 THE WITNESS: So that is a transgender
16 girl, got it. So --- and the question is do I have a
17 view on --- I apologize. Go back.

18 BY ATTORNEY BROOKS:

19 Q. I can do it again.

20 A. Yes, do it again. Sorry.

21 Q. Do you have a view as to whether it is
22 reasonable to exclude a natal male with a transgender
23 identity from participation in the girls high school
24 basketball team?

1 ATTORNEY BLOCK: Objection to form.

2 THE WITNESS: And it is do I have a view
3 on excluding --- as an expert am I opining on that? I'm
4 not. I'm opining as a scientist on what the data are.

5 BY ATTORNEY BROOKS:

6 Q. Do you consider a policy that excludes natal
7 males with a male gender identity from the girls
8 basketball team to be, quote, discriminatory?

9 ATTORNEY BLOCK: Objection to form and
10 scope.

11 THE WITNESS: So as an expert I'm not
12 taking a position on excluding cisgender males from the
13 female category, if I answered that correctly.

14 BY ATTORNEY BROOKS:

15 Q. My question was simply do you consider such a
16 policy to be a discriminatory policy?

17 ATTORNEY BLOCK: Objection to form and
18 scope.

19 THE WITNESS: So are you asking me as an
20 expert to define discrimination?

21 BY ATTORNEY BROOKS:

22 Q. I will direct you to paragraph 27 of your
23 rebuttal report. And there you wrote Doctor Carlson has
24 not offered cogent explanation for why alleged safety

1 concerns based on average differences in size and
2 strength should be addressed within an across the board
3 exclusion of transgender women as opposed to tailored
4 nondiscriminatory policies.

5 Do you see that?

6 A. I do.

7 Q. So understanding discriminatory, however you did
8 understand it when you wrote that, do you consider a
9 policy that prohibits natal males with a male gender
10 identity from participating on the girls basketball team
11 to be a discriminatory policy?

12 ATTORNEY BLOCK: Same objections.

13 THE WITNESS: Right. So I'm not defining
14 --- I'm not defining discriminatory here. I'm ---
15 right. So if you are asking as an expert to define
16 discriminatory, that I can't do.

17 BY ATTORNEY BROOKS:

18 Q. Well, if you don't know what discriminatory
19 means, what do you mean when you referred to a tailored
20 nondiscriminatory policy?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: I guess I have to circle
23 back initially to --- I mean we can do that for any word
24 here, right, where I could have like my own personal

1 definition or am I acting as an expert to define these
2 words, and I think we are kind of in that situation.

3 BY ATTORNEY BROOKS:

4 Q. But I'm asking you about your expert reports in
5 the litigation. You must have meant something. What
6 did you mean by nondiscriminatory when you submitted
7 this expert report?

8 ATTORNEY BLOCK: Objection to form.

9 THE WITNESS: So when I'm using the word
10 nondiscriminatory I am using it to mean something that
11 isn't using some other indicator --- well, I'm really
12 just using it in the broadest sense to something that is
13 including people.

14 BY ATTORNEY BROOKS:

15 Q. Using it in the broadest sense, discriminating
16 between one category and another is --- could be a good
17 thing or a bad thing.

18 Correct?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: As an expert I --- that is
21 way outside my scope. But simply as an English speaker,
22 yes, discrimination could be good or it can be bad, yes.

23 BY ATTORNEY BROOKS:

24 Q. And for instance, if you are --- well, you said

1 you don't prescribe to minors, so --- but if you are
2 dealing with a 19-year-old who says and you concluded I
3 need gender affirming hormone, and I will use the term
4 you prefer, if that individual's hormones and biology
5 are female then gender affirming hormones are going to
6 consist, among other things, perhaps of administering
7 testosterone.

8 Correct?

9 A. Yes, typically we would have have ---.

10 Q. And if that individual's biology and hormones
11 endogenous were male, then the gender affirming hormones
12 would include among other things estrogen or estrogen
13 analog.

14 Correct?

15 ATTORNEY BLOCK: Objection to form.

16 THE WITNESS: If that person had
17 typically --- typically a male hormone profile, right,
18 to move toward a more feminine profile that typically
19 would include estrogens or some other agents that were
20 other than testosterone, yes.

21 BY ATTORNEY BROOKS:

22 Q. So speaking scientifically and not in civil
23 rights terms, if I may, you as a scientist, as you
24 decide which regimen of hormones to administer to this

1 individual have to discriminate between those who are
2 endogenously male and those who are endogenously female
3 in deciding which regimen you prescribe.

4 Correct?

5 ATTORNEY BLOCK: Objection to the form.

6 THE WITNESS: We have to make a decision.

7 And so if you are trying to get me to say that
8 discrimination can be defined as making decisions, I'm
9 with you and yes.

10 BY ATTORNEY BROOKS:

11 Q. Okay.

12 Let me just run down a few items to make sure.
13 You have not personally engaged in any research
14 regarding sports physiology, have you?

15 A. I'm trying to think if there's anything. I
16 don't believe I have.

17 Q. You yourself haven't personally engaged in any
18 research or published any papers --- that's a compound
19 question. You, yourself, haven't engaged in any
20 research relating to sports medicine or sports injuries,
21 have you?

22 A. I have not engaged in any research with regard
23 to sports injuries. And the answer to the first part of
24 that gets a little muddled because some of the papers

1 that I have written about physiology and transgender
2 people could apply to sports medicine.

3 Q. Have you, yourself, ever participated in
4 devising any athletic training regimes for individuals
5 of either sex?

6 A. I've not been involved in devising any training
7 regimes.

8 Q. Have you done any research with related to male
9 physiology --- I'm sorry, male physiological advantages
10 relevant to athletics before, during or after puberty?

11 A. So there I have --- none of the research that I
12 have done to date has been specifically loopholed as ---
13 well, I can't even say that. So research that I have
14 done with regard to observing physiology among my
15 subjects can be applicable to sports medicine in some
16 context.

17 Q. On what publications, if any, of yours do you
18 believe relate to male physiological advantages in
19 athletics before, during or after puberty?

20 A. Well, just off the top of my head, without
21 looking at it exhaustively, I have a paper on
22 hematocrit, which is the oxygen-carrying cells in
23 people. In transgender people I have a paper on
24 testosterone levels with different treatments. So those

1 can have --- those actually can have a sports context.

2 Q. Have you done any research on the impact of
3 testosterone suppression on athletic performance or any
4 measurement of strength?

5 A. So the second piece of that is I have not done
6 any research that specifically used strength as an
7 endpoint in my own studies. To the second piece of
8 those --- I forgot what ---.

9 Q. Athletic performance?

10 A. Athletic performance, there it gets a muddled
11 thing. The research that I have done can be applicable
12 in that context.

13 Q. Well, that is if your endpoint is hematocrit
14 count, to use the right term, you're saying that might
15 have implications for athletic performance? Is that
16 your point?

17 A. That is correct, yes.

18 Q. But you have not done any research in which any
19 measurement of athletic performance is an endpoint?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: Again, I have to think
22 about how to say that because some of the --- part of
23 the problem is that papers that we're looking at include
24 quite a bit of literature on components that may be

1 applicable --- that may be applicable in sports
2 medicine, whether it is muscle strength and muscle size
3 or blood cell counts and such. And so that more
4 expansively than my research is in that category.
5 Whereas, if I'm trying to be focused and narrow, then
6 I've got those two studies, the one by Roberts and the
7 one by Harper. And my papers are not those.

8 BY ATTORNEY BROOKS:

9 Q. You don't have any information about numbers of
10 children in West Virginia who suffer from any DSD, do
11 you?

12 A. No, as --- I guess I have to say no there in
13 terms of actual surveys of kids in West Virginia, I know
14 some brought statistics. West Virginia is big enough
15 that you would predict that the statistics would
16 generally apply, but that is as smart as I could get on
17 the subject.

18 Q. And you are --- I think you effectively answered
19 this, but to be clear for the record you are not opining
20 that BPJ suffers from any DSD?

21 ATTORNEY BLOCK: Objection to the form.

22 THE WITNESS: So the --- here too we get
23 into --- into an evolving area of definitions where you
24 could envision if some of the specific genetics that are

1 associated with being transgender became identified,
2 would we in the medical world start to label those
3 instances as DSD? It's possible. So that is just ---.

4 BY ATTORNEY BROOKS:

5 Q. Thus far no such indicators have been
6 identified.

7 Correct?

8 A. I can't even --- I can't even say that
9 definitively. It is an area of active conversation in
10 terms of --- in terms of boarder setting in the medical
11 community right now.

12 Q. However, I think my question is easier. You're
13 not offering an opinion --- any opinion that BPJ suffers
14 from any DSD, are you?

15 A. So I don't have --- so to be clear first I don't
16 know the --- BPJ's specific medical condition. I wasn't
17 brought in to evaluate that and I have not. So I can't
18 actually render an opinion on any of the medical story
19 there.

20 Q. And you don't know whether any child or typical
21 XY chromosome --- pardon me, you don't know whether any
22 child with XY chromosomes who suffers from a DSD has
23 ever sought to compete in female athletics in West
24 Virginia up until the present?

1 ATTORNEY BLOCK: Objection to the form.

2 THE WITNESS: So the question is do I
3 know of an instance of a specific individual with XY
4 chromosomes and a DSD connected to that who has
5 specifically participated in sports in West Virginia?

6 BY ATTORNEY BROOKS:

7 Q. Who has sought to participate in female
8 athletics in West Virginia?

9 A. Right, so who has sought to participate in
10 female sports in West Virginia. I cannot give you a
11 specific instance, that is true. I can say, though,
12 knowing the percentage of people who have DSDs and the
13 size of the State of West Virginia that you would
14 predict it would be true, but that would be again as
15 smart as I could be on one subject.

16 ATTORNEY BROOKS: Let me mark as Safer
17 Exhibit 15 what was previously designated as Tab 53, an
18 article by Dr. Safer and others entitled the Mount Sinai
19 Patient Center Preoperative Criteria Meant to Optimize
20 Outcomes are Less of a Barrier to Care than WPATH SOC 7
21 Criteria Before Transgender Specific Surgery. And yes,
22 that is a mouthful.

23

24

(Whereupon, Exhibit 15, Dr. Safer Article,

1 Q. And the paper I should say for the record is
2 dated 2020. And let me see if I correctly understood
3 what the paper is about. If we --- in this paper you
4 compare the eligibility of patients who are seeking
5 vaginoplasty under the WPATH Standard of Care 7 criteria
6 versus the criteria actually used by your clinic.

7 Am I correct?

8 A. Yes.

9 Q. And just so we're clear, vaginoplasty is a
10 surgery that is only done on biological male, natal male
11 individuals.

12 Correct?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: So a vaginal plasty is the
15 genital reconstruction surgery to create a vagina in a
16 person. When we are using it as a gender affirming
17 surgery, then we are using it on people who have what
18 would be considered typically male anatomy in that
19 circumstance but the surgery could also be used on
20 somebody with typically female anatomy requiring
21 construction for whatever their circumstance may be.

22 BY ATTORNEY BROOKS:

23 Q. That said, the subjects discussed in this paper
24 are all individuals who are seeking the surgery for

1 gender affirming purposes rather than, for instance,
2 because of a severe DSD.

3 Correct?

4 A. The people in this circumstance are all people
5 seeking the surgery for gender affirming purposes and
6 not those for DSD or for other purposes, reconstruction
7 of vaginas for accidents and cancers. I mean there is
8 quite a range.

9 Q. And the result as summarized in the abstract is
10 that of 139 patients who were identified as subjects of
11 this study, 63 qualified for surgery immediately based
12 on the Mount Sinai criteria.

13 Correct?

14 A. Yes.

15 Q. Whereas only 21 of those would have qualified
16 based on the criteria set out in the WPATH Standard of
17 Care Version 7?

18 A. Yes.

19 Q. Three times as many individuals qualified for
20 immediate surgery under the standard used by your clinic
21 as opposed to the standards set out in the WPATH
22 Standard of Care?

23 A. That's correct.

24 Q. When did your clinic begin approving surgery for

1 patients who are not eligible under the WPATH Standard
2 of Care?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: Yeah, so to be clear, the
5 patients in our program qualify by both criteria. The
6 paper is simply pointing out that our process is more
7 efficient and patient friendly, but it's not to say that
8 we were not informed by WPATH criteria also. And I
9 think I need to expand even a little bit further. Part
10 of the point of the paper is that it includes --- it
11 includes efforts to know benefit to the patient that end
12 up being time consuming and therefore are a waste of
13 energy in contrast to our approach, which is actually
14 more conservative than WPATH's approach. We actually
15 look at more things but we do so in a more efficient
16 fashion and that is actually the point of the paper.

17 BY ATTORNEY BROOKS:

18 Q. Well, let me clarify one thing you just said.
19 According to this paper, it is not the case, is it, that
20 every patient for whom your clinic approved surgery was
21 at that time qualified according to the WPATH criteria?

22 ATTORNEY BLOCK: Objection to form.

23 THE WITNESS: Wait. Say it again. Could
24 you repeat that?

1 BY ATTORNEY BROOKS:

2 Q. It is not the case, is it, that every patient
3 who was qualified for surgery by your clinic had been
4 demonstrated to satisfy the WPATH criteria for
5 eligibility?

6 A. It is --- so there were --- the patients just as
7 stated who qualified by our criteria but not by WPATH
8 criteria, there is such a group that existed, exactly,
9 yes.

10 Q. Okay.

11 And specifically, according to your criteria,
12 three times as many patients are eligible according to
13 WPATH criteria?

14 ATTORNEY BLOCK: Objection to form.

15 THE WITNESS: It's not so much the three
16 times. It is the pace. Some of this relates to pace
17 and efficiency.

18 BY ATTORNEY BROOKS:

19 Q. Dr. Safer, your clinic, according to this paper,
20 approved for surgery 42 patients who were at that time
21 not eligible according to WPATH criteria.

22 Correct?

23 ATTORNEY BLOCK: Objection to form.

24 THE WITNESS: No. So the reality is we

1 still live in the universe that everybody else lives in,
2 so we are --- so this paper proposes a more appropriate
3 and a more patient appropriate model, but it is not the
4 case that we actually sent people to surgery who would
5 not be approved by WPATH.

6 BY ATTORNEY BROOKS:

7 Q. Well, were you personally involved in developing
8 and approving Mount Sinai's criteria?

9 A. Let me look at the role here. Yes, I definitely
10 had a role in developing our criteria.

11 Q. Let me ask you to look at page 168, column one,
12 call your attention quite a bit to table one. And if I
13 understand correctly, table one is designed to help us
14 compare and contrast what is required by the WPATH
15 criteria for surgical readiness versus the Mount Sinai
16 criteria for surgical readiness.

17 Correct?

18 A. That is correct, yes.

19 Q. And the WPATH requires a letter of support from
20 the patient's hormone provider confirming the hormone
21 regimen and the length of time of hormone therapy.

22 Correct?

23 A. That is how it is written, yes.

24 Q. And farther down, under mental health it says

1 that it requires two letters of support from mental
2 health providers?

3 A. It does, yes.

4 Q. And it gives on page 157 a definition who is a
5 qualified mental health professional down towards the
6 bottom of the second column. I'm going to ask you to
7 find that language if you could?

8 A. Uh-huh (yes), yes.

9 Q. You say, many define licensed mental health
10 providers having one or more of the following
11 credentials, the LCSW, Licensed Clinical Social Worker.

12 Is that right?

13 A. LCSW is Licensed Clinical Social Worker, yes.

14 Q. And MD, DO that is a medical doctor, a doctor of
15 --- what does the O stand for?

16 A. Osteopathy.

17 Q. There we go. A psychiatrist, a Ph.D., yes, that
18 was surprising to me. Surely not just any Ph.D.?

19 A. Right, that's referring to a Ph.D. clinical
20 psychologist.

21 Q. Okay.

22 Or any Master's level for above counseling
23 degrees. But then you go on to say that in your
24 evaluation based on SOC-7 criteria. That's the WPATH

1 criteria?

2 A. That's the WPATH criteria, yes.

3 Q. We included the above degrees with the following
4 exclusions, mental health providers with lower than
5 Master's level training and unlicensed mental health
6 providers of any type, NPs and PAs without mental health
7 credentials, physicians who are not psychiatrists or
8 mental health providers who are still in training. Do
9 you see that language?

10 A. I do.

11 Q. So under the definition used in your clinic you,
12 yourself, do not qualify as a mental health
13 professional.

14 Correct?

15 A. That is correct.

16 Q. So at no point have you relied on your own
17 opinion for any mental health evaluation for
18 eligibility?

19 A. That's correct.

20 Q. Okay.

21 I just wanted to understand that clearly. So
22 back to mental health data. It says in the WPATH column
23 that two letters of support from mental health providers
24 are required. In this paper you state on the next page,

1 but I will quote it the most significant of the Mount
2 Sinai criteria is the removal of the requirement of two
3 independent psychiatric evaluations. And that is in
4 column two of page 169, at the end of the first full
5 paragraph. The first full paragraph, column two, the
6 final sentence.

7 A. I'm in which column? Sorry.

8 Q. Column two.

9 A. Oh, column two. Sorry.

10 Q. The first full paragraph, final sentence.

11 A. The most significant deletion from the Mount
12 Sinai criteria is the removal of --- yes, I see that.

13 Q. And you stated at the top of column one on the
14 same page that, quote, finding two mental health
15 providers to do independent evaluations is
16 time-consuming, expensive and difficult.

17 Right?

18 A. Just trying to find that exact wording. Yes.

19 Q. So in your own clinic's practice, while WPATH
20 calls for two letters from independent mental health
21 providers, you concluded that because it was hard to get
22 two independent evaluations your clinic would simply
23 dispense with the requirement of any independent mental
24 health review.

1 Correct?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: No, that is not quite
4 correct. Part of the difference for our operation is
5 that we have --- we have expertise in-house and we have
6 --- if you notice, looking at the table, a longer list
7 of requirements actually than WPATH does, which includes
8 a social work component. And that actually is the ---
9 that's the source of actually yet a second pair of eyes,
10 as it were. And so it is not the case that we are ---
11 that we're providing less of a screen, we are actually
12 providing more of a screen. It's just that we are
13 operating in a more efficient manner for the patient.

14 BY ATTORNEY BROOKS:

15 Q. Let's flip back to column one. A few more lines
16 down it says for our analysis patients who otherwise met
17 WPATH SOC 7 criteria received one letter of support from
18 the CTMS mental health provider. Right? You would
19 agree with me, would you not, that the only letter of
20 support for a mental health provider required by your
21 protocols is from a mental health provider within your
22 employment?

23 ATTORNEY BLOCK: Objection to not reading
24 the complete sentence.

1 THE WITNESS: So yes. So maybe let me
2 just --- show me the wording again.

3 BY ATTORNEY BROOKS:

4 Q. Yes. For our analysis --- and I'm beginning at
5 perhaps eight lines down.

6 A. Our analysis, yes.

7 Q. Patients who otherwise met WPATH SOC 7 criteria
8 received one letter of support from the CTMS mental
9 health provider doing the assessment, period, closed
10 quoted.

11 Do you see that?

12 A. I do, yes.

13 Q. As the term is generally understood in your
14 field, a CTMS mental health provider is not independent
15 --- let me use the correct terminology, is not an
16 independent mental health provider?

17 A. So in a clinic setting I don't know that the
18 word independent actually has the same meaning as in
19 some other context. So even a WPATH requirement isn't
20 necessarily that it would be an unaffiliated person or I
21 don't know what you were thinking independent might mean
22 here, so I don't want to put words in your mouth or
23 conjecture too much. But when we say independent we
24 just mean two different people.

1 Q. But in fact, the letter of support from the CTMS
2 mental health provider that you refer to in this
3 paragraph at the top of column one of page 169 actually
4 plays no role in your determination as to whether this
5 patient is eligible for surgery.

6 Correct?

7 ATTORNEY BLOCK: Objection to form.

8 THE WITNESS: So yes. I'm confused by
9 the question.

10 BY ATTORNEY BROOKS:

11 Q. I'm confused by the text. The final paragraph
12 --- sentence in that paragraph reads these letters of
13 support were used to satisfy third payor requirements to
14 cover surgery and were not part of the CTMS assessment?

15 A. Oh, yeah, that's a good point. The literal
16 letter is because we are all in-house the opinion of the
17 person is, of course, important and so the screen takes
18 place. But the need to create --- the bureaucratic of
19 creating a specific letter is one of the burdens that we
20 are suggesting could be removed.

21 Q. In table one, let me find this. Under mental
22 health WPATH SOC-7 requires, quote, persistent, well
23 documented gender dysphoria.

24 Do you see that?

1 A. I do.

2 Q. And you understand well documented gender
3 dysphoria to be referring to a general diagnosis under
4 the DSM-V criteria?

5 A. So for WPATH's purposes I think they are
6 specifically referring to the DSM diagnosis.

7 Q. In your clinic you are willing to approve for
8 this --- I'm not sure how to actually say the word
9 vaginoplasty surgery, individuals who do not suffer from
10 persistent well documented gender dysphoria.

11 Correct?

12 ATTORNEY BLOCK: Objection to the form.

13 THE WITNESS: So if you look, the list of
14 the criteria for Mount Sinai, then the phrasing is a
15 confirmation that this person --- for all intents and
16 purposes, that this person is transgender and with the
17 language and evolution we use that word gender dysphoria
18 and we also use the new word that will replace gender
19 dysphoria, gender incongruence, as the terms I
20 referenced before, transgender.

21 BY ATTORNEY BROOKS:

22 Q. And the effect of that is you do not require a
23 diagnosis of gender dysphoria under the terms of DSM-V.

24 Correct?

1 ATTORNEY BLOCK: Objection to form.

2 THE WITNESS: So the --- yeah, if we had
3 our druthers, which is I think you are asking, and we
4 did not --- and we weren't simply satisfying a third
5 party payor, would we insist on that formal DSM-V
6 criteria for a person we otherwise know to be
7 transgender? We would not.

8 BY ATTORNEY BROOKS:

9 Q. And in fact, you do not.
10 Correct?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: Well, as a practical
13 matter, like I said, we live in a universe where we end
14 up doing both what we suggest is the necessary approach
15 and we end up, because we still live in the universe
16 that we live in, satisfying the other approach even
17 though we're suggesting that it's cumbersome.

18 BY ATTORNEY BROOKS:

19 Q. Dr. Safer, you testified earlier that, in fact,
20 in 42 patients your clinic determined they were surgery
21 eligible even though they did not satisfy the SOC
22 criteria listed in column one of table one?

23 A. Right. So they are not --- so they would be ---
24 they theoretically would be eligible without having

1 satisfied the --- some of those specific WPATH criteria
2 that we discussed. But in practice nobody went to
3 surgery without covering both sets of criteria.

4 Q. Isn't the precise results reported by this paper
5 that 42 patients were deemed surgery approved who did
6 not qualify under WPATH criteria?

7 A. But I guess the bottom line of the paper is that
8 if we followed our --- our rules alone, we would
9 actually cover more details and be more conservative in
10 our approach if a longer list of criteria and we would
11 do so more quickly. That's all the paper says. It
12 doesn't say that we have --- that we have actively
13 defied the existing universe and sent people to surgery
14 without covering the criteria that are generally being
15 used by doctors.

16 Q. And by the way, the surgery we're talking about,
17 vaginoplasty, in the context where it is being used for
18 gender affirming purposes, invariably includes
19 castrating the individual.

20 Correct?

21 ATTORNEY BLOCK: Objection to form and
22 foundation.

23 THE WITNESS: So a vaginoplasty is a
24 genital reconstruction surgery, which in this context is

1 taking the existing typically --- typical male genitalia
2 and reconfiguring it into typically female genitalia.
3 And in that --- in the procedure the testes are removed.

4 BY ATTORNEY BROOKS:

5 Q. They're not reconfigured?

6 A. They are not reconfigured.

7 Q. Let me ask you 169, column one, it says about
8 two-thirds of the way down, at the end of the paragraph
9 that begins medical requirements for the Mount Sinai
10 CTMS? I want to direct your opinion --- your attention
11 to the final sentence.

12 A. So which paragraph, column one.

13 Q. Column one, the paragraph that begins halfway
14 down, medical requirements?

15 A. Yes.

16 Q. Now, let's jump to the end. The Mount Sinai
17 criteria also removed the 12-month continuous hormone
18 therapy requirement for the vaginoplasty which
19 complicates matters for people who have received hormone
20 therapy from non-medical providers.

21 Do you see that language?

22 A. I do.

23 Q. Explain to me the reference for people who have
24 received hormone therapy from non-medical providers?

1 A. Well, it is the circumstance that some people
2 more so outside of New York, some transgender people
3 still do not have access to care for --- to gender
4 affirming care and do get some of their treatment by
5 alternative means. And if there is an insistence on a
6 documented 12-month continuous hormone therapy
7 requirement, then those people might not be able to be
8 approved for surgery.

9 Q. I need to ask you to clarify what you mean by
10 obtaining by alternate means?

11 A. We have people getting hormones from internet
12 providers. We have people inappropriate --- well, I
13 apologize, I don't want to make a value judgment there,
14 but we have people getting hormones from friends or
15 connections of theirs, things outside the system.

16 Q. So you have some people come to you who have
17 effectively self-diagnosed and self-prescribed ---

18 ATTORNEY BLOCK: Objection.

19 BY ATTORNEY BROOKS:

20 Q. --- hormone therapies?

21 ATTORNEY BLOCK: Objection to form.

22 THE WITNESS: So when we are seeing
23 people for surgeries, then it is no longer a matter of
24 self-diagnosis because we see them ourselves with our

1 internal team. But there are people who have
2 self-prescribed their hormones or obtained them by
3 nonconventional means, that part, yes.

4 BY ATTORNEY BROOKS:

5 Q. And when people come in who have obtained
6 hormones by nonconventional means and taken them without
7 prescription necessarily, you chose to remove the
8 requirement for 12 months properly prescribed continuous
9 hormone therapy rather than insisting that the patients
10 undergo control of hormone therapy for 12 months before
11 you operate on them?

12 ATTORNEY BLOCK: Objection to form.

13 THE WITNESS: So to clarify, again, these
14 are --- we are proposing that this would be the
15 protocol. In practice, we have not been able to do
16 this, that is we have had to do both. But in our
17 experience, as a program we don't see any benefit to a
18 supervised --- a supervised regimen, that is we are not
19 --- I'll just leave it there.

20 BY ATTORNEY BROOKS:

21 Q. WPATH in table one requires that all psychiatric
22 symptoms be, quote, well controlled.

23 Correct?

24 A. They use that language, yes.

1 Q. And the language under the CTMS column is rather
2 different. Among other things it says no suicide
3 attempt in the last six months. Do you see that?

4 A. Let me find it. We're in the table, right?

5 Q. We are in the mental health section under CTMS
6 column?

7 A. Yes.

8 Q. No suicide attempt in the last six months. But
9 if the patient tried to commit suicide seven months ago,
10 that's okay?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: So the point here and the
13 distinction is that the WPATH criteria are too vague,
14 and so what you are observing with the Mount Sinai
15 criteria is they're much more granular. And rather than
16 leaving something to some subjective interpretation we
17 define some of the specifics to make it clearer on what
18 the guidelines should be.

19 BY ATTORNEY BROOKS:

20 Q. You refer here in your guideline to no suicide
21 attempt in the last six months. If a patient has
22 entertained suicidal thoughts but made no attempt in the
23 last six months, did that patient potentially satisfy
24 the Mount Sinai criteria?

1 A. So that kind of decision would be at the
2 discretion of the reviewing mental health professional,
3 the psychiatrist or the psychologist, and so you can
4 certainly envision different circumstances. So even
5 going back to your example of seven months, you could
6 envision that something like that might be considered,
7 depending upon the person, too unstable even though they
8 technically met criteria. This isn't just a check box.
9 It is more a guideline. And similarly, to your point
10 about a suicidal ideation, there are different tiers of
11 them. And I won't claim to be an expert on the
12 specifics there, but my mental health professionals are
13 more concerned about some of those than others.

14 ATTORNEY BROOKS: Take a break.

15 VIDEOGRAPHER: The current time reads
16 3:35 p.m. Eastern Standard Time.

17 OFF VIDEOTAPE

18 - - -

19 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

20 - - -

21 ON VIDEOTAPE

22 VIDEOGRAPHER: We are back on the record.
23 The current time is 3:55 p.m. Eastern Standard Time.

24 BY ATTORNEY BROOKS:

1 Q. Dr. Safer, you testified earlier, and I think
2 I'm using the word that you used that if your clinic had
3 its druthers they would be following or making decisions
4 strictly based on the criteria that are laid out in this
5 paper, Exhibit 15, under the heading of Mount Sinai
6 CTMS.

7 Correct?

8 A. Yes.

9 Q. And can I infer from that that you, yourself,
10 don't view the WPATH SOC-7 as setting out scientifically
11 established best practices but rather recommendations on
12 which you use different?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: No, I would not say that.
15 So SOC-7 sets out the guidelines as things were
16 understood in 2011 and 2012, and we have learned ---
17 we've learned and things have evolved since then in
18 terms of the care of transgender people.

19 BY ATTORNEY BROOKS:

20 Q. Did you have any participation in the
21 development of the SOC-7 guidelines?

22 A. I had very minimal participation. I helped
23 review some articles that informed those guidelines.

24 Q. Those guidelines --- did you have any

1 familiarity with the process of how they were being
2 drafted?

3 A. I'm trying to think if I can say things
4 usefully. I was not close enough to the process that we
5 would want --- that I would want to start commenting on.

6 Q. Do you know whether they addressed issues on
7 which opinions within the drafting committee differed?

8 A. I can't comment on SOC-7. We are literally
9 writing SOC-8 now.

10 Q. And on that are there issues that the SOC-8 is
11 addressing on which opinions significantly differ?

12 A. Yes.

13 Q. So it's not that every aspect of the guidelines
14 are unanimously agreed by every member?

15 ATTORNEY BLOCK: Objection to form.

16 THE WITNESS: So with medical guidelines
17 in general there isn't --- that unanimity wouldn't be a
18 thing. They're referred to as consensus documents
19 rather than unanimous documents.

20 BY ATTORNEY BROOKS:

21 Q. And what that tells us is that there is --- that
22 reasonable people differ on at least some aspects of
23 what is set forth in the document?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: In all guidelines,
2 including these, members of the committee even differ in
3 terms of how things are framed and when consensus is
4 obtained, but not unanimity.

5 BY ATTORNEY BROOKS:

6 Q. How many gender performing surgeries or gender
7 affirming surgeries were performed in your clinic in
8 2021?

9 A. In 2021, all --- there were, according to the
10 New York Times, about 9,000 total surgeries performed at
11 Mount Sinai hospitals, including everything we do. So
12 that wouldn't just be vaginoplasty. That would include
13 chest reconstruction surgeries, revisions of older
14 surgeries, et cetera.

15 Q. Well, you quote the New York Times. Where did
16 they get the information?

17 A. I suppose the sources is us.

18 Q. You believe that number to be approximately
19 accurate?

20 A. I think that's right.

21 Q. I don't trust the New York Times, but you have a
22 pass. And now 2021 may or may not have been affected by
23 COVID in terms of patients presenting and wanting
24 surgery. Has there been a clear trend in numbers of

1 surgeries performed by your clinic over the last five
2 years?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: So there is definitely an
5 increase in the number of surgeries at Mount Sinai over
6 the past five years. Unfortunately, expectation is the
7 challenge. We opened the program in 2016, so roughly
8 those five years. And certainly the first few years
9 were quieter as the reputation grew. In 2020, numbers
10 were down because we had to divert resources to taking
11 care of people with COVID. Our group, including myself,
12 literally dropped what we were doing for a period of
13 time to go become COVID hospital employees, and so there
14 was a dip there in 2021 as a little bit of a rebound
15 element to it.

16 BY ATTORNEY BROOKS:

17 Q. Are you able to give me any average total
18 receipts of your clinic or the hospital as a whole and
19 associated physicians from gender affirming surgeries
20 performed within 2021?

21 A. I'm sorry, say that again.

22 Q. Let me just ask this again. Do you have any
23 knowledge as the total --- as to the total receipts of
24 your clinic or the wider hospital and physicians

1 involved as a result of gender affirming surgeries
2 performed by your clinic in the last year?

3 A. So do I know some of the financial elements?

4 Q. Correct.

5 A. So I do know some of the financial elements, but
6 nothing that the hospital would allow me to share.

7 Q. Your counsel can designate it as confidential
8 later on, so it doesn't become public, but you are
9 obliged to answer the question.

10 ATTORNEY BLOCK: I'm not ---.

11 BY ATTORNEY BROOKS:

12 Q. I'm entitled to understand your financial
13 interest in the area of your testimony.

14 ATTORNEY BLOCK: We are not representing
15 him in the context of any legal dispute with Mount
16 Sinai.

17 ATTORNEY BROOKS: I am entitled to
18 understand the expert's financial interest. And I
19 suggest to you, Counsel, that you'd rather have me
20 questions asked here where you can designate it as
21 confidential than at trial in a public courtroom.

22 ATTORNEY BLOCK: It's not up to me.

23 ATTORNEY BROOKS: You can confer if you
24 want, because that would be the alternative. If you

1 want to step out and confer with your witness, you
2 should do so.

3 ATTORNEY BLOCK: It's not up to me to say
4 what he can and can't say in contravention with an
5 agreement with his employer, and so I think if you want
6 to like obtain like a Protective Order, you know, with
7 him.

8 ATTORNEY BROOKS: We have a Protective
9 Order in place, Counsel.

10 ATTORNEY BLOCK: I know, I'm not
11 representing him in that capacity, though. So if you
12 want to interface with his attorney through Mount Sinai
13 then you can, but I don't have an attorney/client
14 relationship with him for purposes of any employment
15 disputes.

16 ATTORNEY BROOKS: Are you instructing the
17 witness not to answer?

18 ATTORNEY BLOCK: No, I'm not.

19 ATTORNEY BROOKS: Are you refusing to
20 answer?

21 THE WITNESS: I wouldn't be able to
22 answer without including the hospital lawyers.

23 BY ATTORNEY BROOKS:

24 Q. Can you tell me ---?

1 ATTORNEY TRYON: This is Dave Tryon. I'm
2 sorry ---.

3 ATTORNEY BROOKS: Go ahead.

4 ATTORNEY TRYON: May I just also say that
5 I think if the witness is not willing to disclose his
6 financial interest here, that that would be grounds to
7 disqualify him as a witness, which on behalf of the
8 state I would likely pursue. So I would respectfully
9 request that he answer the question.

10 ATTORNEY BLOCK: Dave, on what basis is
11 that grounds to --- he has disclosed everything required
12 by the rules. You're asking for --- he has no financial
13 interest in this litigation.

14 ATTORNEY BROOKS: We don't need to argue
15 the motion right now. The motion seems likely, the
16 motion will be briefed, but we don't --- we got no Judge
17 here, we're not going to be deciding ---.

18 ATTORNEY BLOCK: If you want to file a
19 subpoena as a third-party subpoena for that information
20 with a Court Order, than you're free to do so. He is
21 appearing here as an expert witness on his expert
22 testimony. So you have plenty of discovery tools to
23 obtain that information. And we're not his counsel for
24 that.

1 ATTORNEY BROOKS: I do have discovery
2 tools, including asking him questions at this
3 deposition. I've attempted to do so. You have not
4 instructed him not to answer. The witness has refused
5 to answer. The record is clear.

6 BY ATTORNEY BROOKS:

7 Q. Let me ask you about personally. Does your own
8 income or any bonus you receive depend on any part of
9 the overall revenues of your plan?

10 A. It does not.

11 Q. And does your personal income consist strictly
12 of a salary or also a salary plus fees associated with
13 surgeries performed?

14 A. Exclusively a salary.

15 Q. And your income depends in no way on how many
16 surgeries, you yourself perform?

17 A. That --- well, I don't perform surgeries I'm not
18 an endocrinologist.

19 Q. Pardon me.

20 A. But that's right, it's not revenue based.

21 Q. It's not revenue based in any way?

22 A. In any way. That's right.

23 Q. That is helpful. Do you have any understanding
24 as to the average revenues per patient that your clinic

1 receives for patients who are seeking gender affirming
2 surgery in the clinic?

3 A. We don't characterize it that way. There's a
4 --- there's a wide range of reimbursements or lack of
5 reimbursements across medicine. And gender affirming
6 care includes quite that entire range actually, from
7 mental health, which is under reimbursed, to the
8 surgeries which are --- where there's more money.

9 Q. I've been waiting to hear the flip side of that.

10 A. So yes, so we have that, so I don't think I
11 could give --- I wouldn't --- even were I allowed by the
12 hospital to give you the specifics, I don't know that I
13 would be able to do that on a per patient basis.

14 Q. Can you tell me your total personal income in
15 2021 from --- in any way related to your work in
16 connection with your employment at Mount Sinai?

17 A. So is this something that I'm answering?

18 ATTORNEY BLOCK: I'm sorry, could you
19 restate the question?

20 THE WITNESS: He's asking for my ---
21 you're asking for my salary?

22 BY ATTORNEY BROOKS:

23 Q. I'm asking for your total income, in any way
24 --- in 2021 in any way associated with the clinic at

1 Mount Sinai?

2 A. So we're running into --- so I'm simply on
3 salary, but the specifics of that are also something
4 where I would need to include the Mount Sinai lawyers,
5 because that's part of their practice, and I would have
6 to defer to them.

7 Q. You decline to answer the question about your
8 own personal income?

9 A. Yes.

10 ATTORNEY BROOKS: I won't take time to
11 speak upon it, but I will object.

12 BY ATTORNEY BROOKS:

13 Q. I read in some document that your spouse is an
14 employee of Parexel --- if I'm pronouncing that company
15 correctly.

16 Is that still the case?

17 A. Yes.

18 Q. And does that company derive any revenues from
19 the sales, testing, clinical trials of any
20 pharmaceutical that is used to suppress puberty or is
21 used as a cross sex hormone?

22 A. I don't know the answer. Parexel is a very
23 large back office organization supporting clinical
24 research with many clients. And so you can envision

1 some connection buried in there, but I don't know
2 specifics.

3 Q. Fair enough.

4 ATTORNEY BROOKS: Let me have 54.

5 BY ATTORNEY BROOKS:

6 Q. Let me ask you to turn to paragraph 18 in your
7 expert report, and there in the first sentence you write
8 although the detailed mechanisms are unknown, there is a
9 medical consensus that there is a significant biologic
10 component underlying gender identity, closed quote.

11 Do you see that?

12 A. No, I might have pulled the wrong thing out.

13 Which ---?

14 Q. It's the expert report not the rebuttal?

15 A. Expert report. And it's which paragraph?

16 Q. Paragraph 18?

17 A. Oh, sorry.

18 Q. This is why lawyers number their paragraphs.

19 A. That is wise. All right. Paragraph 18.

20 Q. I'm just calling your attention --- and I have
21 read into the record the first sentence of that
22 paragraph.

23 A. I see it.

24 Q. And picking up on our earlier discussion about

1 consensus. When you say there is a medical consensus,
2 do you mean that all experts in the field agree or do
3 you mean that in your view this is a majority opinion?

4 ATTORNEY BLOCK: Objection to form.

5 THE WITNESS: So when I guess similar to
6 when we talked about guidelines if the question is, is
7 there unanimity, then there is never unanimity, so there
8 you go.

9 BY ATTORNEY BROOKS:

10 Q. Okay.

11 A. I can be a little stronger, though, because the
12 mainstream medical organizations have various statements
13 in this space. So for example, the endocrine society,
14 which is the largest international organization of
15 endocrinologists does actually have a statement where
16 the sum of the modeling for gender affirming care is
17 prefaced with statements that support this.

18 Q. In providing the basis for your opinion that
19 there is such a consensus, you cite only two papers and
20 those only papers that you had written yourself.

21 Did you consider those papers written by
22 yourself to adequately document the existence of the
23 medical consensus?

24 ATTORNEY BLOCK: Objection to form.

1 Q. Let me --- I learned something in this
2 deposition, so that is good.

3 Let me call your attention to page two and
4 column two, and in the very bottom paragraph ---.

5 ATTORNEY BLOCK: I'm sorry, did you mean
6 200?

7 ATTORNEY BROOKS: I did mean 200. I
8 apologize. That is also the second page.

9 BY ATTORNEY BROOKS:

10 Q. In the bottom --- first column bottom paragraph
11 it states, quote, however it is important to note that
12 most transgender individuals develop a gender identity
13 that cannot be explained by atypical sexual
14 differentiation, closed quote.

15 A. So this is column two.

16 Q. Column one. If I misspoke I apologize.

17 A. I could have misunderstood at this hour.

18 Q. At the bottom paragraph?

19 A. However it is important to note, I'm there, yes.

20 Q. All right.

21 Can you explain to me what is meant by the
22 statement that most transgender individuals have a
23 gender identity that cannot be explained by atypical
24 transgender differentiation?

1 A. So that is referencing, in this context at the
2 time that this was written, the anatomy, genitals,
3 reproductive structures.

4 Q. And let me just --- for purposes of terminology,
5 you said at the time this was written. This is about
6 seven years ago, six years ago?

7 A. 2015, yes.

8 Q. And if you look at the page one, column one
9 abstract. This paper is using the term disorders, in
10 sexual development, and that DSD.

11 Do you see that?

12 A. I do.

13 Q. That was a term that you were comfortable with
14 most recently?

15 A. It was a terminology that I was using that
16 recently, yes.

17 Q. The point here, on page 200, column one, that we
18 were just looking at is, in fact, most transgender
19 individuals do not suffer from any identifiable DSD.

20 Is that what this is saying?

21 A. From a physically identifiable DSD, that is what
22 this is saying, yes.

23 Q. Physically, genetically, hormonally,
24 identifiable by any physical measurement.

1 Correct?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: So you have to be careful
4 to be not too broad, and part of the reason is the line
5 there is actually blurring. So when I'm sitting here
6 and talking in 2022 I recognize that there is a
7 potential for some blurring in that line. But in 2015
8 it was certainly understood to be how you're saying it.

9 BY ATTORNEY BROOKS:

10 Q. Well, it remains true today, does it not, that
11 the overwhelming majority of transgender individuals do
12 not suffer from any identifiable atypicality
13 genetically, physically or hormonally.

14 Correct?

15 A. Well, that's not how I would say it, because
16 gender identity is a biological phenomenon and so one
17 would predict that as we identify certain correlates or
18 even explanations, than we will have things in that
19 space. But if we're talking about how things were
20 defined in 2015, being transgender was defined as
21 somebody where their gender identity was not aligned
22 with the rest of their biology, and there was no
23 apparent, physical variation either in terms of their
24 anatomy or their chromosomes in terms of their genitals,

1 in terms of their reproductive anatomy or in terms of
2 their chromosomes. So that is how it was defined at the
3 time.

4 Q. Well, today, and using identifiable to mean you,
5 Doctor safer, are able to identify it now, not
6 hypothetically in the future, it remains true that the
7 overwhelming majority of transgender individuals do not
8 suffer from any current identifiable, physical
9 chromosomal or hormonal irregularity.

10 Correct?

11 A. I would say that right now in 2022, it would be
12 true to say that a transgender person does not have an
13 identifiable genital difference almost by definition or
14 a --- or an internal reproductive organ difference
15 almost by definition. Chromosomal I can't say, because
16 we actually don't check. And hormonal gets even grayer
17 than that, because it could be the case that there are
18 hormonal exposures, for example, in utero that explain
19 at, least some people as being transgender.

20 Q. As you sit here today, you don't know of any
21 chromosomal test that can identify an individual as
22 transgender, do you?

23 A. Is there a --- there --- as I sit here today
24 there are no tests to identify somebody who is

1 transgender.

2 Q. And that includes genetic tests?

3 A. There's no scan and there are no blood tests and
4 there are no genetic tests.

5 Q. And no hormonal tests?

6 A. That's right. There are no hormonal tests right
7 now to identify a transgender person.

8 Q. As you sit here today and based on your whole
9 knowledge of the field, there is no biological test from
10 some mental professionals, as they can do, but there is
11 no biological test that will tell you in advance which
12 prepubertal child who is suffering from gender dysphoria
13 would persist and which would desist as they enter
14 adolescence?

15 A. So I would have to challenge how you're stating
16 that a little bit just so that we are cleaner in terms
17 of how we think. So we're thinking right now in terms
18 of identifying kids who are transgender. We use various
19 terminologies, so that --- we've have been using the
20 term gender dysphoria we're going to be shifting to more
21 gender incongruence, but we're trying to identify people
22 who are transgender and who may require intervention
23 later.

24 Recognizing further that only a subset of

1 transgender people would require a medical or surgical
2 intervention. And so if the question is can --- is
3 there a test now in 2022 to determine in an prepubescent
4 kid who says they're transgender or people who suspect
5 may be transgender on whatever they're saying, no, there
6 is no test to know that is true or not and to know if
7 they'll think that later or not, and to know if they'll
8 want treatment or not.

9 Q. So it is your opinion that there is consensus
10 that there is a biological basis for transgender
11 identification, but as of 2022 you don't know with any
12 confidence what that biological basis is.

13 Correct?

14 ATTORNEY BLOCK: Objection to form.

15 THE WITNESS: I would say that it is
16 complicated and there may even be more --- there might
17 be multiple explanations for people being transgender.
18 We see that with other biological entities like
19 diabetes, for example. So the idea that we don't know
20 what it is, is also a little too narrow.

21 BY ATTORNEY BROOKS:

22 Q. You don't know any one identifiable biological
23 cause with any confidence that state within a scientific
24 knowledge?

1 A. No. That's not quite true. We know that ---
2 and it's not even the biology of being transgender even
3 though that is how I just framed it. It is even one
4 step back which is the biology of gender identity. We
5 all have gender identity, and how is that determined and
6 what is that biology. And we know there --- and we know
7 then that some transgender people have that particular
8 biology not aligned with some of their other biology.

9 So going back to what you just asked, that we
10 don't know any mechanisms is not quite true. That is
11 people that looks to be true that exposure to androgen,
12 male hormones in utero can have some influence on some
13 people as to their identity.

14 Q. Well, if there is not yet any test that is
15 predictive of gender identity in a prepubescent child,
16 then as a matter of science it follows that you don't
17 actually know any causal relationship, any biological
18 basis, is that not true?

19 A. No, that wouldn't be quite sure. We can't test
20 for somebody deemed transgender, and we can't test
21 gender identity with a test. But like I said, that at
22 least in some circumstances the androgen exposure in
23 utero, in a mother's womb, could be part of the
24 explanation for some people. Maybe isn't all the

1 explanation for some people.

2 Q. It could be, but no science has been done to
3 prove that that is a fact, has it?

4 A. So it isn't really a hypothetical, that is we do
5 have --- we do have data that support it, but it doesn't
6 lead us to a test.

7 Q. If it is not testable, then it is a hypothesis,
8 not a fact, isn't it, not of science.

9 Correct?

10 ATTORNEY BLOCK: Objection to form.

11 THE WITNESS: No, that is using testing
12 two different ways. So in a scientific study, then a
13 hypothesis is something that you have based on a certain
14 --- based on certain data, but then you test to see how
15 true it might be. But when I was using the word test,
16 I'm talking about like a blood test or something that we
17 could actually do on a given individual to know their
18 circumstance with regard to their gender identity.

19 BY ATTORNEY BROOKS:

20 Q. Let me ask you to look at the paper that I've
21 marked as Exhibit 16, Evidence Supporting the Biological
22 Nature. Is that that which you have in front of you?

23 A. I do, yes.

24 Q. And on the first page you refer under the result

1 that begins by discussion of a seminal study by
2 Meyer-Bahlburg. Do you see that? Second column,
3 beginning of the results section.

4 A. Yes.

5 Q. And is it your contention that the
6 Meyer-Bahlburg study provides evidence of a biological
7 basis for transgender identification?

8 A. What the Meyer-Bahlburg study does is it
9 provides evidence of a biological basis for gender
10 identity.

11 Q. Well, specifically the study, the Meyer-Bahlburg
12 study --- let me have that so we are not shooting in the
13 dark. Exhibit 17 is a paper from 2005 from Professor
14 Heino Meyer-Bahlburg, entitled Gender Identity Outcome
15 in Female Raised 46, comma XY persons with penile
16 agenesis, and it continues. It's a long document?

17 ATTORNEY WILKINSON: Tab 14.

18

19 (Whereupon, Exhibit 17, 2005 Paper by
20 Professor Heino Meyer-Bahlburg, was marked
21 for identification.)

22

23 BY ATTORNEY BROOKS:

24 Q. I believe the level of questions that I will be

1 asking, however, are the ones that you will know off the
2 top of your head given the importance of this study in
3 the field. The study concerned exclusively children who
4 are born with what's referred to as a 46 XY condition.

5 Right?

6 A. Yes.

7 Q. And that is long recognized as a DSD?

8 A. No, 46 XY is the classic male chromosome
9 pattern.

10 Q. Yes. Pardon me. So these are individuals with
11 typical male pattern chromosomes?

12 A. Yes.

13 Q. Who, however, for some reason have had a
14 developmental disorder or defect affecting their
15 genitals?

16 A. Who have had some sort of alteration or
17 development of their genitals, exactly.

18 Q. And the study concerns the results of efforts to
19 raise such genetically male children as female in some
20 cases after surgical procedures to feminize them and in
21 some cases absent surgical procedures.

22 Correct?

23 A. The study really relates to the gender identity
24 of those where there is an attempt to raise them as

1 females.

2 Q. And the results, if I understand the study, were
3 mixed, that is that some of the individuals who were
4 raised as females nevertheless came to identify as male
5 and some of the individuals who were raised as females
6 came --- persisted in identifying as female.

7 Correct?

8 A. It is not actually as clean as you're saying it.
9 So we should look at some of the specifics and we might
10 need to point out to specific sentences, but this too is
11 a survey of --- a survey of studies, to be clear, it's
12 not its own isolated study, and then there --- in none
13 of these studies were they systematic or, you know, I
14 guess I will just use the word systematic in
15 ascertaining that all of the people who were being
16 raised female and ascertaining all of the gender
17 identity of those people. But what they are really
18 observing is that the numbers that they mention of the
19 people who they were trying to raise female who had male
20 gender identity were whatever the numbers were. I don't
21 know if that makes sense, but you'll follow as
22 necessary.

23 Q. If you turn to page 432 it begins under the
24 heading discussion. It begins, quote, the main findings

1 can be summarized as follows. One, the majority of 46
2 XY individuals with presumably normal male prenatal
3 hormonal milieu, comma, non-hormonal anatomic
4 abnormalities of the genitals, comma, and female gender
5 assignment at birth or in early childhood have not
6 changed gender to male. Do you see that?

7 A. I do see it.

8 Q. And one thing, and I understand the
9 qualifications that you've just described this is not
10 recording a carefully structured study performed by
11 Doctor Meyer-Bahlburg but rather a review of case
12 histories.

13 Right?

14 A. Exactly.

15 Q. But his conclusion from his review of those is
16 that the majority of genetically presumably normal male
17 individuals who were raised female, and I believe it's
18 fair to summarize in most cases after feminizing genital
19 surgery, adhered to a female gender identity at least to
20 the data we have?

21 A. Yes, so I don't know whether they actually all
22 had surgery or not.

23 Q. They did not all have surgery.

24 A. Right or even the larger number. I don't know.

1 I would have to go through.

2 Q. Fair enough.

3 A. But the --- and it was his opinion at the time
4 he was writing this that the majority who were reared
5 female were living as female, although we don't know
6 their gender --- but now this is me stepping out, saying
7 we don't know their gender identity, nobody asked. The
8 reason why this paper is interesting is even in the
9 circumstance where they were being so passive in how
10 they were collecting the data, such a large fraction of
11 these individuals were so clear in their male gender
12 identity that they actually identified themselves
13 against the protocols.

14 Q. And that seemed to be evidence that --- of a
15 biologic basis of gender identity congruent with their
16 male genetics.

17 Correct?

18 A. That --- for these people, that's right. That
19 is with or --- with their chromosomes.

20 Q. Right.

21 A. Which you would predict. If we think about ---
22 if we recognize --- if we think that by survey a half a
23 percent or even a full percent of people are transgender
24 that would mean that 99 percent of people are cisgender.

1 And so if you take a population of people with certain
2 chromosomes, 99 percent of them are going to be
3 cisgender and will have a gender identity incongruent
4 with their chromosomes.

5 Q. The study includes no individuals who were
6 raised with a gender identity inconsistent with their
7 male chromosomes who came to identify or later perceived
8 themselves as identifying as female.

9 Correct?

10 A. Well, we don't know that because they were ---
11 they're all XY individuals who were being raised female.
12 And somebody who had a female gender identity who is
13 transgender among them would never be identified as
14 transgender in this case.

15 Q. So my question was a little more specific. The
16 study simply doesn't include any individual who had male
17 chromosomes who was raised male who came to identify as
18 female?

19 A. That's correct. All of these people who are XY
20 chromosome people raised female.

21 Q. And you would agree with me, would you not, the
22 study provides some evidence that external forces such
23 as feminizing surgery or how their parents treat the
24 child can have some influence on the formation of gender

1 identity?

2 A. I can't say that because the study really
3 doesn't go there. The study is only passive observation
4 and all --- the only thing I would say with some
5 confidence is that some fraction of these individuals
6 who are so clear in their gender identity that despite
7 nobody even looking for that sort of thing, because that
8 wasn't even a consideration when these --- when these
9 cases occurred, they --- the individuals spontaneously
10 announced to the authorities around them, parents and
11 doctors, that they were wrong, that the parents and
12 doctors were wrong.

13 Q. And that, in your view, provides at least some
14 evidence of a genetic basis for gender identity
15 congruent with chromosomal sex?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: No. It provides some
18 evidence of a biological basis for gender identity that
19 can't be manipulated externally.

20 BY ATTORNEY BROOKS:

21 Q. Well, considering that the study included no
22 examples of any individual who adopted a transgender
23 identity inconsistent with how they were raised, the
24 study simply can't provide any information about

1 biologic basis of transgender identification, can it?

2 A. Wait. I think say that again.

3 Q. The study includes no individuals who adopted a
4 gender identity, a transgender identity apart from
5 social transition and, therefore, can provide no
6 information one way or the other about whether there is
7 or is not a biologic basis for transgender
8 identification?

9 A. So not quite. So the --- because remember the
10 point is that gender identity, period, universally, has
11 a biological basis. It's not that we --- and to be
12 clear, I don't even know that we won't find and some
13 people even wonder if we will find a gene that
14 associates a gene with transgender, per se. But I'm not
15 even saying that. If there's --- I'm only saying that
16 we will find let's say genes associated with gender
17 identity and not everybody will have them aligned with
18 the rest of their biology. So I just want to preface
19 with that.

20 And in this particular review, they're taking
21 people who have XY chromosomes exclusively. So
22 therefore, if one --- if a certain fraction of them were
23 to have female gender identity despite assuming
24 different development they would have had male --- they

1 would have had other male biology, those are the people
2 we would have categorized as transgender using current
3 definitions. And those individuals would not have been
4 apparent in this study they were being raised female
5 anyway.

6 Q. And my point was that, therefore, that this
7 study can't provide any information about whether there
8 is or isn't a biological basis for transgender
9 identification?

10 A. So yes. I guess how you are framing that is
11 where I'm pushing back. So the point of this study is
12 as evidence of there being a biological basis of gender
13 identity period, having nothing --- not necessarily for
14 being transgender. In fact, I don't even know if there
15 --- yeah, I don't even know if that would be the model.
16 The model would be somebody who has a certain gender
17 identity, a certain other biology, and then that
18 combination is what we are calling transgender.

19 Q. You also referenced a paper by Doctor Reiner.
20 And let me have that.

21 ATTORNEY BROOKS: And I will mark that as
22 Exhibit 18, 2004 Discordant Sexual in Some Genetic Males
23 With Cloacal Exstrophy Assigned to Female Sex at Birth.

24 ATTORNEY WILKINSON: Tab 71.

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(Whereupon, Exhibit 18, Paper by Doctor Reiner, was marked for identification.)

BY ATTORNEY BROOKS:

Q. And Dr. Safer, you are well familiar with this paper.

Am I correct?

A. I am, yes.

Q. And this is the only other paper that you cite for the assertion that gender identity has a biological basis.

Am I correct?

A. No, there are a range of categories of papers, but these are two of my favorite papers in the first category, which is the category of attempting to manipulate gender identity externally.

Q. Dr. Bahlburg in his paper, on page 433 of Exhibit 14, in column one ---.

A. Yes. Let me get there.

Q. Yes. 433, column one.

A. 433, column one.

Q. He says about two inches off the bottom, referring to the Reiner and Gearhart paper of 2004,

1 which I believe is this paper, he says, quote, it has
2 serious methodological flaws. Do you agree with that
3 statement?

4 A. Let's read what he is criticizing. All these
5 papers have their weaknesses. All right. So the
6 remainder of that --- so the remainder of the paragraph
7 is --- details the complaints for Doctor Meyer-Bahlburg,
8 where his --- which I focus as a social science
9 researcher that they didn't do various assessments that
10 would make it --- that would make standard people doing
11 some of this research able to replicate some of the
12 items in the paper. And I will --- so while Doctor
13 Meyer-Bahlburg may be frustrated and be complaining
14 about that, he is not actually attacking the veracity of
15 their results.

16 Q. Well, the point was serious methodological flaws
17 is you are not really able to evaluate the veracity of
18 the results.

19 Correct?

20 A. Not necessarily.

21 Q. Do you agree with Doctor Meyer-Bahlburg's
22 evaluation that the methodology of the study reported by
23 Reiner and Gearhart suffers from serious methodological
24 flaws?

1 A. No.

2 Q. So let's summarize this study if I may. I'm
3 turning to page 334.

4 A. And extending that too, part of his frustration
5 wouldn't be my frustration because I am not looking for
6 those particular endpoints, that is for my purposes for
7 determining whether gender identity is a biological
8 basis Reiner and Gearhart's paper is actually quite
9 strong.

10 Q. Let's look at the first page in the summary up
11 front. It refers to this paper dealt with 16 --- under
12 methods, 16 genetic males.

13 Correct?

14 A. Yes.

15 Q. And these were all males who suffered from ---
16 uses the word in the second line of the background as
17 severe developmental disorders affecting their genitals.

18 Correct?

19 A. That's how it is phrased here. Where am I
20 seeing that?

21 Q. The second line of the background says severe.

22 A. Severe phallic inadequacy, yes, I see that.

23 Q. Which is to say not --- absent or severely
24 disformed penis?

1 A. That's what that means, yes.

2 Q. Okay.

3 But these are individuals who are genetically
4 male, and more than that, on page 334, column two,
5 two-thirds of the way down it says the testes were
6 histologically normal in all 14 when examined?

7 A. I'm on column two.

8 Q. It is column two.

9 A. I apologize.

10 Q. You can kind of see where my finger is pointing
11 here.

12 A. And this is under ---.

13 Q. Under methods and the paragraph that begins
14 parents to be educated?

15 A. Testes were histologically normal in all 14.
16 I'm there, yes.

17 Q. So we had individuals who were genetically male
18 that had normal testes and had severe deprivation of
19 their penis or it was absent?

20 A. Yes.

21 Q. And what was done to these 14 subjects, looking
22 just above that, is that they were assigned a female sex
23 surgically by means of orchiectomy and construction of
24 vulva.

1 Right?

2 A. Yes.

3 Q. And orchiectomy is another medical term for what
4 the layman thinks of as castration?

5 A. As removing the testes.

6 Q. And construction of the vulvi is creating a ---
7 I'm not sure what the right term is, a pseudo vagina?

8 A. It wouldn't be a pseudo vagina, but creating a
9 vagina.

10 Q. It says that --- just immediately following the
11 description of the surgery 14 of these 16 --- looking
12 back at the results paragraph and the abstract, 14 of
13 these 16 were assigned female but later declared
14 themselves male despite the surgery, despite being
15 raised as female.

16 Right?

17 A. Right, 8 of the 14 who were assigned female.

18 Q. I'm sorry, I misread that. Thank you. Eight of
19 the 14 who were assigned female nevertheless declared
20 themselves male at some stage?

21 A. That's correct.

22 Q. And the two who had been raised as males, even
23 though they suffered the same type of phallic
24 developmental defect, remained identifying as males.

1 Correct?

2 A. Yes.

3 Q. There was an --- whatever assignment was made,
4 this was made to infants. It wasn't made or based on
5 any choice or reported sense on the part of the child?

6 A. That's exactly right, yes.

7 Q. So several of these individuals, specifically
8 six, who were assigned female at least throughout the
9 period identified by this study adhered to a female ---
10 living out the female gender identity?

11 A. Actually it was five because one of the children
12 refused to have contact with the surgeons when some of
13 these conversations began to take place.

14 Q. So we know that five --- we don't know what that
15 person was thinking, feeling or identifying --- but we
16 know that five ---?

17 A. They were angry.

18 Q. They were angry. Whichever that came out, I'd
19 be angry, so ---

20 A. Yes.

21 Q. --- so 5 of the 14 subjects who were assigned
22 female and surgically transitioned and socially
23 transitioned continued to at least physically identify
24 as female?

1 A. As of when they wrote the paper they were still
2 identifying as female as far as I remember. That's
3 right.

4 Q. And it would be your position that visibly
5 identifying as female doesn't necessarily mean that they
6 were generally transgender?

7 A. That --- we don't know that because that wasn't
8 asked.

9 Q. Is it your view that if you had these children
10 who were surgically transitioned, socially transitioned
11 visibly identifying as female, that if you had simply
12 asked them you would have found out the undoubted truth
13 about their gender identity?

14 ATTORNEY BLOCK: Objection to form.

15 THE WITNESS: So it is true that as
16 people develop and assuming that there are good language
17 skills and that there aren't other developmental, mental
18 developmental reasons or other mental health reasons why
19 people would not be clear, that people are able to
20 articulate their gender identity. Certainly adults do
21 so apparently quite reliably and older teenagers the
22 same, so depending on age. But yes, there would be a
23 point in time when you could simply ascertain that by
24 asking.

1 BY ATTORNEY BROOKS:

2 Q. Dr. Safer is that fundamentally a medical
3 question or a psychology/mental health question? The
4 question of the reliability of a patient's self report?

5 A. I don't know that I separate it that way. I say
6 that based on the data we slowly develop overtime of
7 transgender people where we see that any absence of
8 other confounding items along the lines that I said,
9 people at a certain stage in maturity who tell you a
10 certain thing about their gender identity are consistent
11 in that regard.

12 Q. This study, the Reiner Gearhart study,
13 Exhibit 18, concerns --- looks at the effect of trying
14 to raise individuals in a gender identity discordant
15 with their chromosomal sex.

16 Correct?

17 A. It is discorded with quite a number of things,
18 but yes, chromosomal is one of your hard data points.

19 Q. This study does not look at the question about
20 whether and when or how any sort of intervention might
21 encourage development of a gender identity consistent
22 with one's genetics sex; does it? It simply does not
23 look at this issue?

24 A. Say that again, sorry.

1 Q. This study does not address the question of
2 whether or how or at what developmental stage
3 therapeutic interventions might encourage the
4 development of a gender identity consistent with one's
5 chromosomal sex?

6 A. The study is --- the way I'm interpreting the
7 study is it's looking at our inability to manipulate
8 gender identity. And it's just that. And I'm a little
9 fuzzy on the rest of what you're asking me.

10 Q. Well, the study looks at efforts to manipulate
11 gender identity away from chromosomal from the identity
12 normally associated with one's chromosomal sex. In this
13 case the male sex.

14 Right?

15 A. It does.

16 Q. This study simply does not look at efforts to
17 manipulate gender identity towards alignment with the
18 identity normally associated with a subject's
19 chromosomal sex?

20 A. I think I'm following you now. So you're
21 suggesting that if we took a transgender person and
22 tried to manipulate their gender identity to align with
23 some of the rest of their biology?

24 Q. I'm not suggesting that I'm simply saying this

1 study.

2 A. That particular instance. Yes.

3 ATTORNEY BROOKS: 15. It is one of the
4 previous marked ones, if that matters. All right.

5 I will not show you that document. Let
6 me ask the court reporter how many --- how much time we
7 have left on the clock.

8 COURT REPORTER: I have 5:52, five hours
9 and 52 minutes.

10 ATTORNEY TRYON: I didn't hear that.
11 Could you repeat that?

12 ATTORNEY BROOKS: We've got an hour and
13 eight minutes according to the clock of the court
14 reporter here, and I believe that our friend in the
15 ether is calculating separately.

16 VIDEOGRAPHER: Correct. And it sounds
17 like the same. I have to do the math.

18 ATTORNEY BROOKS: Okay.

19 BY ATTORNEY TRYON:

20 Q. Are you familiar Dr. Safer with a paper recently
21 published by Lisa Littman of Brown University looking at
22 the surveying 100 teens or young adults --- actually
23 surveying a hundred individuals who report having
24 de-transitioned and gone from identifying as transgender

1 to identifying in a manner consistent with their genetic
2 sex?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: So I'm aware of Dr. Littman
5 having written a second paper. But I'm not facile, I
6 guess.

7 BY ATTORNEY BROOKS:

8 Q. You haven't read that paper?

9 A. I have not read the paper. I probably did read
10 it, but I would not be able to be quizzed on it.

11 Q. Then I won't quiz you on it. I always tell
12 witnesses I don't know is the easiest way out of a line
13 of questioning.

14 Are you --- let me ask you this, does your
15 clinic have any procedure in place to track outcomes on
16 patients on whom you perform gender conforming surgery
17 long term?

18 A. We're actually in the --- we have a couple of
19 processes, so I guess the short answers are yes and
20 we're going to be more rigorous going forward.

21 Q. Do you have any knowledge as to how many
22 patients on whom your clinic has performed surgery have
23 after that surgery committed suicide?

24 A. I don't off the top of my head know that.

1 Q. Do you believe that your clinic possesses
2 reasonably complete information on that question?

3 A. I actually don't think our information is
4 sufficiently complete currently, and that actually is an
5 area where we're going to develop more vigorously,
6 because I would actually like to know that.

7 Q. Do you know whether any patients on whom your
8 clinic has performed surgery has subsequently sought to
9 de-transition and take on or revert to, whichever way
10 you want to see it, a gender identity that's aligned
11 with their chromosomal sex?

12 A. So it's a complicated question. And actually I
13 just want to go back to the first part where you were
14 talking about suicide.

15 To be clear, the rigor I'm talking about is not
16 suicide focused, because I actually am not anticipating
17 that that is --- that that is happening or is happening
18 more than with being seen in a general population, but
19 for all encompassing that we do definitely need that.

20 But back to your current question ---.

21 Q. Let me jump back to suicide for a moment. Are
22 you aware of studies coming out of DeVry University and
23 Amsterdam suggesting that post-surgical transgender
24 populations continues to experience elevated rates of

1 complete suicides compared to controlled populations?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: So I'm aware that
4 transgender people have more mental health morbidity
5 than other populations. Once corrections are made for
6 other confounding factors I don't know that we would
7 have --- that we're very clear yet on those data
8 including ---.

9 BY ATTORNEY BROOKS:

10 Q. When I refer to a published study coming out of
11 DeVry University of Amsterdam showing high rates of
12 suicidality in postsurgical transgender patients, you
13 believe you're familiar with that literature?

14 A. I guess it would fall in the same category as
15 Littman's second paper.

16 Q. Okay.

17 A. Where I'm familiar with the fact that they're
18 doing surveys and I'm familiar with the broad outlines,
19 but could not ---

20 Q. Okay.

21 A. --- comment on specific studies without it being
22 in front of me.

23 Q. And have any patients on whom your clinic has
24 performed surgery subsequently decided to de-transition

1 and assume a gender identity aligned with their
2 chromosomal sex?

3 A. I don't --- I don't know. There is absolutely
4 the case that there are people who stop their treatment
5 at different levels, so it has definitely been my
6 experience that I have patients who I've put on hormone
7 treatments who have stopped those hormone treatments.
8 And there are also, among our patients --- I don't know
9 if any of the patients where we performed the original
10 surgery they actually were opting for a different
11 surgery, but we definitely have patients who have come
12 to us, who had a surgery done elsewhere who were looking
13 for a degree basically what you're calling a reversal,
14 to the degree that that's possible. So that such a
15 thing does exist. So the point about saying that they
16 have a different gender identity, that would --- that is
17 not typically how the patients come saying it. They
18 don't say, oh, it turns out my gender identity is not
19 that. It's more often society is not treating me well,
20 this isn't working out. That's the more --- that's the
21 --- that's the typical scenario. I mean, yes, we
22 definitely have seen that circumstance.

23 Q. Dave Tryon, who is with us remotely as Counsel
24 for West Virginia, I have promised him an hour, so I

1 have to stop, even though I have so many more
2 interesting questions.

3 ATTORNEY BROOKS: So Dave, I will stop
4 and I will turn the witness over to you.

5 ATTORNEY BLOCK: Could we take a break
6 now?

7 ATTORNEY BROOKS: Of course, it is a good
8 time for sure.

9 ATTORNEY BLOCK: Thanks. Can we go off
10 the record?

11 VIDEOGRAPHER: The time is 5:03 p.m.
12 Eastern Standard Time.

13 OFF VIDEOTAPE

14 ---

15 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

16 ---

17 ON VIDEOTAPE

18 VIDEOGRAPHER: We are back on the record.
19 The current time reads 5:25 p.m. Eastern standard Time.

20 ATTORNEY BLOCK: This is Josh Block on
21 behalf of the Plaintiff. We have conferred off the
22 record, including with counsel from Mount Sinai, and
23 Doctor Safer can answer the two questions he declined to
24 answer before provided that we mark those portions of

1 the deposition transcript confidential, and all counsel
2 for Defendants have agreed with that.

3 ATTORNEY BROOKS: And this is Roger
4 Brooks, and yes, I confirm that all counsel for
5 Defendants have agreed to that.

6 CONFIDENTIAL PORTION BEGINS

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CONFIDENTIAL PORTION ENDS

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EXAMINATION

3

4 BY ATTORNEY TRYON:

5 Q. Hello, Dr. Safer. Thanks for your time today.
6 So I am David Tryon. I represent the State of Virginia.
7 I'm appointed by the Attorney General's Office. And I
8 wanted to start out by looking at --- asking you to take
9 a look at your Rebuttal Report. I don't recall what
10 exhibit number that is. If you could tell us what it is
11 marked?

12 ATTORNEY WILKINSON: Exhibit 2.13 ATTORNEY TRYON: Exhibit 2.14 ATTORNEY WILKINSON: Tab 51.15 THE WITNESS: I have that in front of me.16 BY ATTORNEY TRYON:

17 Q. Could you take a look at paragraph six, please?
18 Do you have that in front of you?

19 A. Yes.

20 Q. Great. Now, in here it says in the second or
21 maybe third sentence as reflected in the same source
22 cited by Doctor Brown dimorphous sexual characteristics
23 in men and women are produced by a combination of genes,
24 prenatal androgen exposure to sex hormones. And I'd

1 like to focus on that particular clause. Can you
2 explain what prenatal androgen exposure to sex hormones
3 is?

4 A. Yes. That references --- I guess to me it's
5 more or less exactly what it says, which is that the
6 developing fetus is exposed to various hormones and
7 other factors and androgen is specifically the male ---
8 is typically what we consider to be the male sex
9 hormone, although everyone has some. And then prenatal
10 just means and in utero or in the mother's womb.

11 Q. So androgen for males is testosterone.

12 Is that right?

13 A. Androgen in general is that category of hormones
14 that we think of as typically male, even though, like I
15 said, we all have them. And one of the androgens is
16 testosterone. And with adults it is the one that we are
17 talking about most of the time, of course.

18 Q. Okay.

19 So as I understand it, your suggestion is that
20 that prenatal exposure to testosterone can have an
21 impact even after birth.

22 Is that right?

23 ATTORNEY BLOCK: Objection to form.

24 THE WITNESS: So all factors --- well, I

1 don't want to overstate it, but factors that occur to
2 which a fetus is exposed in the womb have impact on the
3 development of that fetus, of that person when they are
4 born, and so androgens, including testosterone, would be
5 part of that, so yes.

6 BY ATTORNEY TRYON:

7 Q. So are you aware of studies addressing the
8 impact of prenatal exposure to testosterone as it
9 impacts people after their birth?

10 ATTORNEY BLOCK: Objection to form.

11 THE WITNESS: I think I need you to be
12 specific about which studies.

13 BY ATTORNEY TRYON:

14 Q. Are you aware of any study that addresses the
15 effect of prenatal testosterone upon boys after they're
16 born?

17 ATTORNEY BLOCK: Objection to form.

18 THE WITNESS: So the ---.

19 BY ATTORNEY TRYON:

20 Q. Or men?

21 A. So I can --- I guess --- I have to --- kind of
22 two answers. Exposure to prenatal androgens, kind of
23 generally because it is not always, testosterone explain
24 the development of what we consider to be typically male

1 genitalia so that all babies born with what --- with a
2 penis and with a urethra that is the part for which you
3 urinate, that's up inside the penis and having the
4 gonads, which would typically be testes in the scrotum,
5 all of that happens in response to testosterone.

6 BY ATTORNEY TRYON:

7 Q. And then that also triggers a question I had.
8 You had previously said in your original report a
9 person's genetic makeup and internal and external
10 reproductive anatomy are not useful indicators of
11 athletic performance and have not been used in a league
12 competition for decades.

13 My question on that is, when you say a person's
14 genetic makeup doesn't their genetic makeup trigger
15 whether or not they are going to --- a person's genetic
16 makeup will determine whether or not they're a boy or a
17 girl, and therefore if they're a boy that would trigger
18 their generation of more testosterone than a girl.

19 Is that a fair statement?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: Yeah, no, that's --- so I
22 think I need to walk that back a little bit. Why don't
23 we --- can we do it like piece by piece or have you
24 restate parts?

1 BY ATTORNEY TRYON:

2 Q. I will restate it. So when you say a person's
3 genetic makeup, what does that mean?

4 A. Mostly in this context I'm referencing their
5 chromosomes that's the specific that in the further past
6 was actually being used to identify people which we no
7 longer do. It's not sufficiently reliable.

8 Q. Does the --- you have an X Y chromosome that is
9 typically considered to mean that you're a male.

10 Correct?

11 A. The XY chromosome is typically considered to
12 mean that you're a male, correct.

13 Q. And that would mean that you would be generating
14 more testosterone than if you have an X chromosome.

15 Right?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: So the presence alone of
18 that XY pattern is insufficient to know with certainty
19 that you're producing more testosterone and that is part
20 of the point of I'm saying it is that biological sex is
21 more complex, and you could have the gene for the testes
22 that produce testosterone elsewhere, and then you
23 wouldn't have that pattern and you still would be
24 producing the testosterone or vice versa.

1 BY ATTORNEY TRYON:

2 Q. Okay.

3 Well, let's go back to prenatal testosterone.
4 So you're not --- if I understood what you're saying
5 before, you're not aware of any studies that show
6 whether or not prenatal testosterone would have --- let
7 me just start that over again.

8 Are you aware of any studies that address
9 whether prenatal testosterone has impact on sporting, on
10 athletics in children after birth?

11 A. Correct. That would be right to say that there
12 are no studies of which I'm aware that can associate
13 prenatal testosterone with athleticism. And I don't
14 know what levels we're even talking. Like an adult
15 level? What's your question there?

16 Q. My next question is, have you heard of the
17 Journal of Sports Science and Medicine?

18 A. I guess you would have to show it to me.

19 Q. Okay.

20 Have you ever heard the name Jim Goldby or
21 Jennifer Mays?

22 A. No.

23 ATTORNEY TRYON: Jake, could you bring up
24 the Exhibit that I sent to you today, which is the

1 General Sports Science and Medicine?

2 ATTORNEY WILKINSON: Do you see anything?

3 THE WITNESS: I don't see anything. Oh,
4 that's too small. Okay. That's okay.

5 ATTORNEY TRYON: Okay.

6 And this will be Exhibit --- what Exhibit
7 are we on Jake, do you know?

8 VIDEOGRAPHER: This is 19.

9 ---

10 (Whereupon, Exhibit 19, Article, was
11 marked for identification.)

12 ---

13 ATTORNEY TRYON: I'm sorry, 19?

14 VIDEOGRAPHER: Correct.

15 BY ATTORNEY TRYON:

16 Q. Okay.

17 I take it from your earlier answers, you
18 probably never seen it before.

19 Is that right?

20 A. I certainly don't recall. I don't want to state
21 definitively I've never seen it either, but it's
22 certainly not a paper that I'm going to know off the top
23 of my head.

24 Q. Well, let me ask you to take a look at the

1 conclusion on page 449?

2 A. So can we move the pictures because they're
3 blocking.

4 Q. Can you see it?

5 A. We're getting there. And then is there a way to
6 move that? Oh perfect. Yes.

7 Q. Okay.

8 The conclusion says, current paper provides
9 initial support from an association between prenatal
10 testosterone levels and mental toughness, optimism, goal
11 orientations, coping strategies and hostility, period.
12 Findings tentatively suggest that the mentioned
13 psychological characteristics may be partially
14 biologically predetermined.

15 Do you see that?

16 A. I do see it, yes.

17 Q. Do you have any reason to believe whether that's
18 true or not true?

19 ATTORNEY BLOCK: Objection. I just
20 object to asking him about a conclusion when he just has
21 a little snippet of that and hasn't reviewed the
22 article. And I'm not even sure if it has been cited in
23 the other expert reports.

24 THE WITNESS: I certainly can ---.

1 BY ATTORNEY TRYON:

2 Q. Go ahead.

3 A. I certainly cannot say if that conclusion has
4 any logic to it without knowing the study.

5 Q. Understood. Is it possible since this
6 particular study suggests there is an impact on adults
7 by prenatal testosterone? Is it that prenatal
8 testosterone could also have a DSD explanation for why
9 should boys at 11 years old have more athletic ability
10 than girls?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: So speaking --- yeah,
13 speaking as an expert, I can't give you an expert
14 comment there without seeing their study.

15 BY ATTORNEY TRYON:

16 Q. Okay.

17 So you just can't say one way or the other.

18 Correct?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: I mostly wouldn't want to
21 comment on their study. I will only make the
22 observation that the data of which I am aware do not
23 show differences for prepubertal children, if that was
24 part of your question.

1 BY ATTORNEY TRYON:

2 Q. And so the performance data that Dr. Handelsman
3 pointed out showing that there are some damages given
4 before puberty, you reject those?

5 ATTORNEY BLOCK: Objection to form.

6 THE WITNESS: So those broad
7 cross-sectional studies don't get at input, whether they
8 are referencing biological explanations versus societal
9 explanations.

10 BY ATTORNEY TRYON:

11 Q. Okay.

12 Whether it's societal or biologic explanations,
13 Handelsman still demonstrated that there is an advantage
14 for pre-pubescent males over females in athletics.

15 Right?

16 ATTORNEY BLOCK: Objection to form.

17 THE WITNESS: No, neither Dr. Handelsman
18 in his paper --- he doesn't actually say that. And if
19 you --- I think we looked previously at one of the
20 figures where specifically the range of outcomes, if you
21 were to repeat the study, included the girls doing
22 better than the boys.

23 BY ATTORNEY TRYON:

24 Q. Well, that was only one of them. That was not

1 it. That was one of the charts. The other chart showed
2 that there was an advantage, right?

3 ATTORNEY BLOCK: Objection to form.

4 THE WITNESS: The other --- yeah, let me
5 think with that one. Right. We are not getting into
6 what the causality is, then the other charts did show
7 the boys doing better. And again, the caveat remains
8 what is not --- what is not demonstrated there is that
9 there is --- that that is a biological thing versus
10 simply the very longstanding societal and cultural
11 environments.

12 BY ATTORNEY TRYON:

13 Q. And you've contended that there's a biological
14 component to gender identity.

15 Correct?

16 A. Yes.

17 Q. Which we have not been able to identify in this
18 deposition.

19 Correct?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: So it is not quite --- well
22 I actually don't know what's been identified in the
23 deposition. The data are included in my --- in the
24 papers that I referenced that are what are convincing to

1 the medical community right now. The detailed
2 explanations for the specific biology are not known if
3 that's where you're going.

4 BY ATTORNEY TRYON:

5 Q. Assuming there is actually a biological
6 component, as you say, to gender identity, that says
7 nothing about whether a biological male identifying as a
8 female should, as a public policy matter, be allowed to
9 participate on a girls athletic team in high school and
10 middle school.

11 Right?

12 ATTORNEY BLOCK: Objection to form.

13 THE WITNESS: So the way that I would say
14 that is even if we recognize that there is a biological
15 explanation for gender identity, that does not --- well,
16 I don't know that then I can go on to make an expert
17 statement, honestly, because that gets outside my
18 purview and in terms of --- my lane is just simply to
19 say that.

20 BY ATTORNEY TRYON:

21 Q. Got it. Can you look at your rebuttal report
22 and look at page two?

23 A. I have my rebuttal in front of me and I'm on
24 page two.

1 Q. Paragraph 4B?

2 A. I have that in front of me.

3 Q. You say --- great. You say circulating
4 testosterone is the primary known biological driver of
5 average differences in athletic performance. Do you see
6 that?

7 A. I do.

8 Q. You say it is primary so what are the other
9 biological drivers of average differences in athletic
10 performance?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: So when I --- so we're
13 talking about circulating testosterone --- let me just
14 look at this. Right. The truth is, is that it may ---
15 that the only candidates that we have so far are
16 testosterone at puberty and testosterone in the moment.

17 BY ATTORNEY TRYON:

18 Q. So it's --- according to you, it's testosterone
19 at puberty and circulating testosterone are the only
20 biological drivers of average differences in athletic
21 performance.

22 Is that right?

23 A. So excuse me. I'm actually --- so this is the
24 president of the hospital.

1 ATTORNEY BLOCK: I'm sorry. Can we go
2 off the record for a minute and take a break. The
3 president of the hospital is returning his previous
4 call.

5 VIDEOGRAPHER: Going off the record. The
6 current time is 5:48 Eastern Standard Time.

7 OFF VIDEOTAPE

8 - - -

9 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

10 - - -

11 ON VIDEOTAPE

12 VIDEOGRAPHER: Back on the record. The
13 current time reads 5:54 p.m. Eastern Standard Time.

14 BY ATTORNEY TRYON:

15 Q. My last question was according --- according to
16 you, testosterone at puberty and circulating
17 testosterone are the only biological drivers of average
18 differences in athletic performance.

19 Is that right?

20 A. Right, they are the only ones that are known.

21 Q. And in paragraph 4C, looking on page three ---
22 let's move over to page three, at the top of the page,
23 your statement is there is no basis to expect that
24 transgender girls who receive puberty delaying

1 medication followed by gender affirming hormones would
2 have an athletic advantage. There's a comma. But if we
3 just put a period there, is that your opinion?

4 A. That is correct. Yes, that is my opinion.

5 Q. Let me ask you the converse. You say there is
6 no basis to expect that transgender girls who receive
7 puberty delaying medication followed by gender affirming
8 hormones would not have an athletic advantage, period.
9 Would you agree with that statement?

10 A. No.

11 Q. Do you have any --- excuse me, any performance
12 data from an actual athletic event that support your
13 opinion?

14 A. I do not have any data from an actual athletic
15 performance study for that. No, I do not in that
16 context, in that specific instance.

17 Q. Let me ask you to look at your report. Turn to
18 paragraph 45.

19 A. So my report, paragraph 45. All right. I have
20 that in front of me.

21 Q. Great. Finally, unlike elite international
22 competition, schools and colleges often provide athletic
23 competition as part of a broader educational mission.
24 In that context, when scholastic athletics are

1 components of the educational process, institutions may
2 adopt policies designed to emphasize inclusion and to
3 provide the most athletic opportunities to the greatest
4 number of people. You see that.

5 Right?

6 A. I do.

7 Q. So these policies you referred to are designed
8 to emphasize inclusion and to provide the most athletic
9 opportunities to the greatest number of people, what's
10 the source of that policy? Did you come up with that or
11 did you see it someplace else?

12 ATTORNEY BLOCK: Objection to the form.

13 THE WITNESS: So the question is how am I
14 aware? Yeah --- I apologize. You can hear that I'm
15 confused on your question.

16 BY ATTORNEY TRYON:

17 Q. I'll try and do better. You said intuitions may
18 adopt policies designed to emphasize inclusion and to
19 provide the most athletic opportunities to embrace a
20 number of people. And those policies that you're saying
21 there, is that a policy that you read about somewhere or
22 something you are just suggesting? What's the source of
23 that?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: So an operative word in
2 this is may adopt policies, so this isn't referencing a
3 specific policy that I would give you right this moment,
4 if that's what you are asking.

5 BY ATTORNEY TRYON:

6 Q. So right, just aside from education --- this
7 whole paragraph is talking about education, but you're
8 not an expert on education or teaching methodology, are
9 you?

10 A. I certainly am not.

11 Q. And you don't have any degrees in education or
12 training in teaching methodology, do you?

13 A. I do not.

14 Q. And you have no degrees or training in pedagogy?

15 A. I have no degree in pedagogy. I will be careful
16 how absolutely I do not, because that's not my ---
17 that's not where I am representing myself to be an
18 expert. I am involved in some education, but at the
19 scholastic level not, so let's just say no.

20 Q. And you have no expertise as to whether sports
21 or how sports are used as part of educational systems.

22 Right.

23 A. Correct. That is not the expertise. The how
24 and my decisions among this are not my expertise.

1 Q. Do you have any idea how many schools actually
2 have sports programs?

3 ATTORNEY BLOCK: Objection. I couldn't
4 hear the full question. You cut out.

5 BY ATTORNEY TRYON:

6 Q. Sorry. Do you have any idea how many schools
7 have sports programs?

8 A. I could not give you a number, no.

9 Q. Are you aware that some colleges do not have
10 athletic programs?

11 A. I guess I'm vaguely aware. If you're asking me
12 as an expert than I wouldn't comment on that as an
13 expert, but as a human in society I certainly am aware
14 that that is a thing.

15 Q. Okay.

16 And do you have any idea what percentage of
17 kids are in athletic programs in schools versus those
18 that are not that are still students?

19 A. No, I would not be your source for that data
20 point.

21 Q. So when you are expressing this opinion in
22 paragraph 45 that's not an expert opinion there, is it?

23 ATTORNEY BLOCK: Objection to form.

24 THE WITNESS: So right, I guess it's a

1 bit confusing here, because it's not my expert opinion
2 that --- well, I'm certainly aware as an individual that
3 this is a priority and when I sit on --- when I sit on
4 committees where we discuss relative priorities, there
5 are experts present who discuss these priorities. But
6 if I'm speaking to you as an expert, then I --- then I
7 can't be the representative expert in that space.

8 BY ATTORNEY TRYON:

9 Q. Right. Well, I'm just asking, in paragraph 45,
10 given your lack of expertise and education, you are not
11 giving an expert opinion in paragraph 45.

12 Is that a correct statement?

13 ATTORNEY BLOCK: Objection, asked and
14 answered.

15 THE WITNESS: So I'm simply --- I'm
16 raising all of the issues that we know exist, but then
17 I'm not providing an expert opinion in terms of the
18 relative priorities among these circumstances that
19 exist.

20 BY ATTORNEY TRYON:

21 Q. Let me just ask you very clearly is paragraph 45
22 an expert opinion of yours?

23 ATTORNEY BLOCK: Objection to form.

24 THE WITNESS: I don't think I'm even

1 expressing an opinion in paragraph 45, expert or
2 otherwise. I'm simply stating the background situation.

3 BY ATTORNEY TRYON:

4 Q. Okay.

5 But --- okay. I would ask you to turn to
6 paragraph 37 of your report.

7 A. All right.

8 I have that in front of me.

9 Q. This is talking about the International Olympics
10 Committee. Right? Let me move back to paragraphs 35
11 and 36.

12 A. Yes, this is the International Olympic
13 Committee. This relates to the International Olympic
14 Committee.

15 Q. So this 2021 framework, do you believe that you
16 understand this framework?

17 A. I think you'll have to ask more specific
18 questions because I might understand parts and I might
19 have questions about parts.

20 Q. Very good. First of all, it says the 2021
21 framework further provides that, quote, any restrictions
22 arising from eligibility criteria should be based on
23 robust and peer-reviewed research that, A, demonstrates
24 a consistent, unfair, disproportionate competitive

1 advantage with performance and/or an unpreventable risk
2 to the physical safety of other athletes. You see that
3 part, right?

4 A. I do, yes.

5 Q. Do you understand what the word disproportionate
6 means in this context?

7 A. To a degree.

8 Q. Okay.

9 What do you understand it to mean when it says
10 a disproportionate competitive advantage in performance?

11 A. The IOC is aware that there's quite a wide range
12 of advantages with different body types and different
13 biology, and so they use language like disproportionate
14 when they want to talk about something that's --- that's
15 --- that's systematically associated with one
16 circumstance in a way that they think would violate the
17 rules, whatever they might be, for a specific sport.

18 Q. That's pretty ambiguous. I have no idea what
19 that means. Let me see if we can narrow it down. Is a
20 disproportionate competitive advantage in performance
21 --- would 20 percent be a disproportionate competitive
22 advantage?

23 ATTORNEY BLOCK: Objection to form.

24 THE WITNESS: So that's --- I can't

1 answer that, because it depends on context, and I'm not
2 the person who wrote the specific language in that
3 document, so that is the quote from the document. But
4 in terms of --- I don't --- I think we go someplace we
5 don't want to go if we try to over define the specific
6 word disproportionate.

7 BY ATTORNEY TRYON:

8 Q. So it's just not something that you or I could
9 look at and reach any kind of conclusion to tell them
10 what that means sitting here today.

11 Is that right?

12 A. I think if we look at a specific sport, I think
13 that if it was limited to just the two of us we might
14 need more expertise to make a decision.

15 Q. Well, let's say if we talked about the one mile
16 --- running one mile, is that something that we could
17 then determine what disproportionate competitive
18 advantage and performance would mean?

19 ATTORNEY BLOCK: Objection to form.

20 THE WITNESS: It would depend on context.
21 And if we're talking about at the elite level which is
22 what the IOC references and we limited --- even then if
23 we limit it just to you and to myself, we would want
24 more expertise.

1 BY ATTORNEY TRYON:

2 Q. Right. Okay.

3 So we don't know what the IOC meant by this in
4 any particular context do we?

5 ATTORNEY BLOCK: Objection to form.

6 ATTORNEY TRYON: Actually, let me redraw
7 this question.

8 BY ATTORNEY TRYON:

9 Q. You as an expert would not be able to give me an
10 expert opinion on what disproportionate competitive
11 advantage in performance of the one mile run would be;
12 right? You could not give me an expert opinion on that.

13 Fair statement?

14 A. If you break the words out in that --- in that
15 fashion then it does become difficult. If you ask me
16 what the entire statement after the letter A is
17 referencing, I can at least explain some of the thought
18 process for the IOC there.

19 Q. Well, my question is simply, you as an expert,
20 are you able to tell me what --- able to define for me
21 what would be a consistent, unfair disproportionate
22 competitive advantage in performance in a one mile run
23 for the IOC?

24 ATTORNEY BLOCK: Objection to form.

1 THE WITNESS: I, as an expert, cannot
2 give you a blanket explanation of what would
3 specifically consist of --- what would specifically meet
4 that definition. When they wrote the statement they
5 didn't actually even have specific guidance, that is
6 simply the spirit of a guideline --- the spirit of what
7 a specific guideline should consider when that guideline
8 is made.

9 BY ATTORNEY TRYON:

10 Q. Do you know what they meant when they said
11 unfair?

12 A. So the --- it's kind of the same circumstance.
13 That is the purpose of this statement is to be global
14 guidance for the experts in the specific sport when they
15 might develop guidelines relevant to their specific
16 sport. So for example, the group with expertise in that
17 one mile run that you're referencing should think in
18 this context. That's all this is doing.

19 Q. And some of the sporting organizations have come
20 up with some very specific rules.

21 Correct?

22 A. Some of the sporting federations have come up
23 with specific rules, yes.

24 Q. And as I recall, some of them require a certain

1 level of circulating testosterone.

2 Is that right?

3 A. Some of the sporting federations use a certain
4 level of circulating hormone as part or all of their
5 roles.

6 Q. And some of them use the level that you've
7 mentioned that you were involved in setting, which was 5
8 Nmol --- say it for me. Nmole something.

9 A. Nmole/Ls per liter. Yes, some of them use that
10 nmole/L per liter threshold.

11 Q. Did they --- where did they get that 5 nmole/L
12 quantity, do you know?

13 ATTORNEY BLOCK: Objection to form.

14 THE WITNESS: So I do know where that
15 number comes from originally for World Athletics, which
16 is the first one to put that number out. And that
17 number comes from studies of some Olympic athletes in
18 some races where there was for at least certain
19 distances a demonstrable difference between people who
20 had --- and specifically people in the female category
21 who had lower numbers of testosterone than that and
22 higher numbers of testosterone than that.

23 BY ATTORNEY TRYON:

24 Q. You were on that committee.

1 Right?

2 A. I was on the group that wrote that World
3 Athletics policy, yes. Not on the group that did that
4 study.

5 Q. And so how did you finally come up with the
6 number of five as opposed to four or six or three or
7 seven?

8 A. The number five discriminates in terms --- in
9 terms of there being some demonstrated advantage or
10 improved outcome is really what it was, for those with
11 higher numbers versus those with lower numbers. That
12 was not true necessarily with a lower testosterone
13 threshold. That is a difference was not as apparent and
14 that's really the entire logic pattern there.

15 Q. Well, earlier you just said it could have been
16 --- you didn't think there was that much difference
17 between five and six. That was your testimony earlier
18 as I recall.

19 Right?

20 ATTORNEY BLOCK: Objection.

21 THE WITNESS: As an endocrinologist I can
22 tell you that those difference --- that that's right
23 that to --- the difference between five and six would be
24 hard to demonstrate.

1 BY ATTORNEY TRYON:

2 Q. So how did you settle on five instead of six or
3 five or six instead of four?

4 A. So I guess the inputs are that there needed to
5 be a line so that there's ability to enforce something.
6 There needed to be a rule. And the choice of five,
7 mostly, is what I've been saying already, which is ---
8 it's a clean number where there's at least some
9 distances, there's a demonstrable difference in outcomes
10 at that level --- above and below that level.

11 Q. So are you saying that there is a value of
12 having a hard rule?

13 ATTORNEY BLOCK: Objection to form.

14 BY ATTORNEY TRYON:

15 Q. Maybe I should say having a clean rule?

16 A. So as an expert I'm not --- that wasn't my role
17 on the committee to determine that there needed to be a
18 rule, but that is certainly the logic pattern of the
19 committee that there ought to be a rule. That is not my
20 expert opinion.

21 Q. Okay.

22 But different organizations are free to come up
23 with different conclusions of about what their rules
24 ought to be.

1 Right?

2 ATTORNEY BLOCK: Objection to form.

3 THE WITNESS: So the different
4 International Athletic Federations were to make use of
5 data such as it exists to make their own rules for
6 participation in their sports.

7 BY ATTORNEY TRYON:

8 Q. And different organizations came up with very
9 different rules.

10 Right?

11 ATTORNEY BLOCK: Objection to form.

12 THE WITNESS: So most of the
13 international federations still do not have rules,
14 actually. And honestly, that's mostly a logistics
15 situation where some of these organizations are too
16 small to put the data together or the committees
17 together to make rules.

18 BY ATTORNEY TRYON:

19 Q. Those that do have rules have different rules.

20 Correct?

21 A. Those that do have rules have had different
22 conversations in the space. I don't know that I could
23 systematically go through all of them, but there is some
24 variation, yes.

1 Q. Some require --- have a Level 5 nanomoles per
2 liter and some still have ten.

3 Right?

4 A. So I'd have to go back and look. You would have
5 to show me. World Athletics has five for sure. And
6 that's the one where I'm most familiar because I was
7 actually sitting in the room helping draft that. The
8 IOC in the past had used ten as a line, but that just
9 sits there right now as a --- as a number someone might
10 adopt. I actually don't know off the top of my head if
11 anybody has adopted that for their formal rules.

12 Q. What was the scientific basis for the ten
13 nanomoles per liter?

14 A. The logic for ten at the time is it is the
15 bottom of the male range. That's its history.

16 Q. Okay.

17 So it sounds to me like there is room for
18 reasonable discussion about what the appropriate rule
19 ought to be?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: The way I would say it is
22 as different athletic organizations obtain data, they
23 might use those data to determine differences, including
24 if the --- if our best measure is testosterone,

1 different thresholds of testosterone.

2 BY ATTORNEY TRYON:

3 Q. Would it be appropriate to use performance data
4 as well to make those decisions?

5 A. The best data in my opinion are actual outcomes
6 within a given sport.

7 Q. What do you mean by outcomes, performance? Are
8 we saying the same thing?

9 A. I don't know if we're saying the same thing. So
10 the studies that I reference are the Roberts study and
11 the Harper study, where they actually look at specific
12 athletic endeavors and measure those as opposed to the
13 studies where they're simply sitting in a physiology lab
14 measuring somebody move an arm back and forth and
15 thinking that it might associate with some actual
16 athletic performance.

17 Q. Somebody moving their arm back and forth with
18 weights, that's not athletic?

19 A. It's --- again, it would --- right, that's ---
20 that's only --- that's what we would call a surrogate
21 endpoint where you are simply looking at something that
22 might correlate with what you want, but --- but you
23 don't know it until you test it. It ends up being what
24 we call hypothesis generating. That is how we would say

1 it in a scientific way.

2 Q. And the same would hold true with the level of
3 circulating testosterone, you would want to actually
4 test that in real life to see how people's circulating
5 testosterone actually translates into performance of an
6 actual athletic contest.

7 Right?

8 A. That's right. So the data that were used to
9 determine the five nanomole per liter cut point are
10 passively collected data. And if somebody did a study
11 looking at that threshold and found that there was,
12 let's say, no difference, then that rule might be
13 discarded.

14 Q. And so far, other than Roberts and Harper, if I
15 recall correctly, those are the only two that you know
16 of.

17 Right?

18 ATTORNEY BLOCK: Objection to form.

19 THE WITNESS: Those are the only two
20 studies that have gone that extra step and looked at an
21 actual athletic activity with an outcome that is part of
22 that athletic activity and not what I was just
23 referencing, as a surrogate endpoint.

24 BY ATTORNEY TRYON:

1 Q. In those two studies did they check the
2 circulating testosterone in the individuals in these
3 studies?

4 A. I'd have to look. I think we did look earlier
5 today with regard to the Harper study, and I don't think
6 she's referencing testosterone levels at all. Again,
7 I'd have to go back and look to be sure. We were
8 talking about whether they were self-reported. And the
9 --- with the Robert study I would have to go back and
10 look at that one, too. I'm feeling like the answer is
11 no, but we can look there if you want.

12 Q. Yeah, we don't need to. I'm pretty sure that we
13 just talked about how long they had been in the therapy
14 rather than actual measurements.

15 Well, let me move on. I know we don't have a
16 lot of time left.

17 So you said you're familiar in your expert
18 report you are familiar with HB-3293.

19 Is that right?

20 ATTORNEY BLOCK: Objection to form.

21 THE WITNESS: So yes, I'm somewhat
22 familiar.

23 BY ATTORNEY TRYON:

24 Q. Have you read the whole thing?

1 A. I don't think I've read the whole thing, no.

2 Q. When did you first hear of HB-3293?

3 A. I probably first heard of it when the --- when I
4 received contact from the ACLU to serve as an expert
5 witness.

6 Q. Do you recall if that was before or after it was
7 passed?

8 A. I don't recall. I would have to speculate that
9 it would be after, because that would --- I mean that
10 would make sense that that is true, but I don't recall,
11 so I wouldn't be able to answer that.

12 Q. Okay.

13 So we would refer to this as State Women's
14 Sports Law and there's other types of laws like this
15 throughout the country.

16 Are you aware of that?

17 ATTORNEY BLOCK: Objection to form.

18 THE WITNESS: So I'm aware that there are
19 attempts at legislation and some actual legislation
20 passed to block transgender athletes in various
21 permeations, including transgender women in several
22 states. I'm aware of that, yes.

23 BY ATTORNEY TRYON:

24 Q. Are you aware then House Bill 3293 the word

1 transgender does not appear at all?

2 A. House Bill --- that's this one?

3 Q. That is this one.

4 A. I was not aware that the word transgender does
5 not appear at all.

6 Q. Are you tracking the other bills out there that
7 are similar to House Bill 3293?

8 A. I am not personally tracking the other bills,
9 no.

10 Q. Can you take a look at the Handelsman report
11 that you have in front of you. I don't recall the
12 exhibit number.

13 ATTORNEY WILKINSON: I think Exhibit 13
14 --- oh, sorry, it's Exhibit 4, I think.

15 THE WITNESS: I don't see.

16 ATTORNEY WILKINSON: I can give you that.

17 THE WITNESS: The stack got big.

18 ATTORNEY TRYON: We can just bring it ---
19 if you can't find it we can bring it up on the screen?

20 THE WITNESS: Okay.

21 I was given another copy, so we're good.
22 I have it in front of me.

23 BY ATTORNEY TRYON:

24 Q. Okay.

1 On the second page?

2 A. On the second page.

3 Q. Okay.

4 Under fairness and segregation in sports.

5 Do you see that section?

6 A. I do.

7 Q. In the third full paragraph underneath there ---
8 oh the formatting there is a little different than the
9 copy that I have. Let's see. There's a paragraph that
10 starts the terms sex and gender. There it is. The
11 terms sex and gender are often confused as
12 interchangeable. Now, I want you to focus on this next
13 sentence. Sex is an objective specific biological
14 state, a term with distinct fixed facets notably
15 genetic, chromosomal, gonadal, hormonal and phenotypic
16 including genital sex, each of which has a
17 characteristic defined binary form. Did I read that
18 correctly?

19 A. You read that correctly, yes.

20 Q. Do you agree with that statement?

21 A. I don't agree with that statement completely,
22 no.

23 Q. What specifically do you find objectionable.

24 A. It's missing some components of sex, including,

1 for example gender identity. And the phrasing
2 characteristic defined binary form is not necessarily
3 true for each component of biological sex.

4 Q. So you disagree with the statement in the
5 Handelsman report, is that --- did I state that fairly?

6 A. Right. I would characterize the statement as
7 not exhaustive.

8 ATTORNEY TRYON: Let me ask the court
9 reporter if I have any time.

10 COURT REPORTER: I have six minutes and
11 58 --- six hours and 58 minutes.

12 ATTORNEY TRYON: Well, I guess with my
13 last two minutes I'll just say thank you for your time
14 and I appreciate it. And I don't have any other
15 questions. I don't know if any of the other Defendants
16 do. I doubt it. But go ahead. If they do, go ahead.
17 Kelly?

18 ATTORNEY MORGAN: This is Kelly Morgan.
19 I don't have any questions. Thank you so much.

20 ATTORNEY TRYON: Roberta? Susan, you're
21 next.

22 ATTORNEY GREEN: This is Roberta Green on
23 the behalf of the SSAC. No questions. Thank you.

24 ATTORNEY DENIKER: Dr. Safer, this is

1 Susan Deniker. I have no questions. Thank you for your
2 time today.

3 ATTORNEY TRYON: We are finished.

4 VIDEOGRAPHER: This concludes this
5 deposition. The current time reads 6:31 p.m. Eastern
6 Standard Time.

7 * * * * *

8 VIDEOTAPED DEPOSITION CONCLUDED AT 6:31 P.M.

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1 STATE OF WEST VIRGINIA)

2 CERTIFICATE

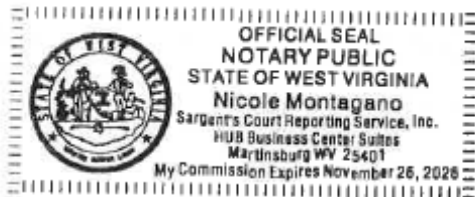
3 I, Nicole Montagano, a Notary Public in
4 and for the State of West Virginia, do hereby
5 certify:

6 That the witness whose testimony appears
7 in the foregoing deposition, was duly sworn by me
8 on said date, and that the transcribed deposition
9 of said witness is a true record of the testimony
10 given by said witness;

11 That the proceeding is herein recorded
12 fully and accurately;

13 That I am neither attorney nor counsel
14 for, nor related to any of the parties to the
15 action in which these depositions were taken, and
16 further that I am not a relative of any attorney
17 or counsel employed by the parties hereto, or
18 financially interested in this action.

19 I certify that the attached transcript
20 meets the requirements set forth within article
21 twenty-seven, chapter forty-seven of the West
22 Virginia.



Nicole Montagano

Nicole Montagano,

Court Reporter

Exhibit

4

Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance

David J. Handelsman,^{1,2} Angelica L. Hirschberg,^{3,4} and Stephane Bermon^{5,6}

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ABSTRACT Elite athletic competitions have separate male and female events due to men's physical advantages in strength, speed, and endurance so that a protected female category with objective entry criteria is required. Prior to puberty, there is no sex difference in circulating testosterone concentrations or athletic performance, but from puberty onward a clear sex difference in athletic performance emerges as circulating testosterone concentrations rise in men because testes produce 30 times more testosterone than before puberty with circulating testosterone exceeding 15-fold that of women at any age. There is a wide sex difference in circulating testosterone concentrations and a reproducible dose-response relationship between circulating testosterone and muscle mass and strength as well as circulating hemoglobin in both men and women. These dichotomies largely account for the sex differences in muscle mass and strength and circulating hemoglobin levels that result in at least an 8% to 12% ergogenic advantage in men. Suppression of elevated circulating testosterone of hyperandrogenic athletes results in negative effects on performance, which are reversed when suppression ceases. Based on the nonoverlapping, bimodal distribution of circulating testosterone concentration (measured by liquid chromatography–mass spectrometry)—and making an allowance for women with mild hyperandrogenism, notably women with polycystic ovary syndrome (who are overrepresented in elite athletics)—the appropriate eligibility criterion for female athletic events should be a circulating testosterone of <5.0 nmol/L. This would include all women other than those with untreated hyperandrogenic disorders of sexual development and noncompliant male-to-female transgender as well as testosterone-treated female-to-male transgender or androgen dopers. (*Endocrine Reviews* 39: 803 – 829, 2018)

Virtually all elite sports are segregated into male and female competitions. The main justification is to allow women a chance to win, as women have major disadvantages against men who are, on average, taller, stronger, and faster and have greater endurance due to their larger, stronger muscles and bones as well as a higher circulating hemoglobin level. Hence, elite female competition forms a protected category with entry that must be restricted by an objective eligibility criterion related, by necessity, to the relevant sex-specific physical advantages. The practical need to establish an eligibility criterion for elite female athletic competition led the International Association of Athletic Federations (IAAF) to establish a rule in 2011, endorsed by the International Olympic Committee (IOC) in 2012, for hyperandrogenic women. That

IAAF regulation stated that for athletes to be eligible to compete in female events, the athlete must be legally recognized as a female and, unless she has complete androgen insensitivity, maintain serum testosterone <10 nmol/L. That IAAF eligibility rule was challenged by an athlete to the Court for Arbitration in Sports, which ruled in 2015 that, although an eligibility criterion was justified, there was insufficient evidence of the extent of the competitive advantage enjoyed by hyperandrogenic athletes who had circulating testosterone >10 nmol/L over female athletes with circulating testosterone in the normal female range. The Court for Arbitration in Sports suspended the rule pending receipt of such evidence. In that context, the present review presents the available evidence on the hormonal basis for the sex difference

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ESSENTIAL POINTS

- It is widely accepted that elite athletic competitions should have separate male and female events
- The main justification is that men's physical advantages in strength, speed, and endurance mean that a protected female category, with objective entry criteria, is required
- Prior to puberty, there is no sex difference in circulating testosterone concentrations and athletic performance
- From male puberty onward, the sex difference in athletic performance emerges as circulating testosterone concentrations rise as the testes produce 30 times more testosterone than before puberty, resulting in men having 15- to 20-fold greater circulating testosterone than children or women at any age
- This wide, bimodal sex difference in circulating testosterone concentrations and the clear dose-response relationships between circulating testosterone and muscle mass and strength, as well as the hemoglobin level, largely account for the sex differences in athletic performance
- Based on the nonoverlapping, bimodal distribution of circulating testosterone concentration (measured by liquid chromatography–mass spectrometry) with 95% reference ranges of 7.7 to 29.4 nmol/L in healthy men and 0 to 1.7 nmol/L in healthy premenopausal women—making an allowance for women with the mild hyperandrogenism of polycystic ovary syndrome, who are overrepresented in elite athletics—the eligibility criterion for female athletic events should be a circulating testosterone concentration of <5.0 nmol/L

in athletic performance. It concludes that the evidence justifies a revised eligibility criterion of a threshold

circulating testosterone concentration of 5 nmol/L (measured by a mass spectrometry method).

Sex, Fairness, and Segregation in Sport

If sports are defined as the organized playing of competitive games according to rules (1), fixed rules are fundamental in representing the boundaries of fair sporting competition. Rule breaking, whether by breaching eligibility or competition rules, such as use of banned drugs, illegal equipment, or match fixing, creates unfair competitive advantages that violate fair play. Cheating constitutes a fraud against not just competitors but also spectators, sponsors, the sport, and the public. In the absence of genuine fair competition, elite sports would lose their wide popular appeal and ability to captivate and inspire with the authentic attraction of genuine contest between highly trained athletes.

Nevertheless, fairness is an elusive, subjective concept with malleable boundaries that may change over time as social concepts of fairness evolve. For example, until the late 19th century when organized sports trainers emerged, training itself was considered a breach of fairness because competition was envisaged at that time as a contest based solely on natural endowments. Similarly, sports once distinguished between amateurs and professionals. The concept of fairness has deep and complex philosophical roots mainly focused on notions of distributive justice. These considerations affect sports through the universal application of antidiscrimination and human rights legislation. Less attention is given to the philosophical basis of fair competition in elite sports, where the objectives are not egalitarian but aim to discover a hierarchy of achievement derived

from a mixture of unequal natural talent and individual training effort. Excellent, insightful discussion of the legal and moral complexities of sex and fair competition in elite sports from a legal scholar and former elite female athlete is available (2).

The terms *sex* and *gender* are often confused and used as if interchangeable. *Sex* is an objective, specific biological state, a term with distinct, fixed facets, notably genetic, chromosomal, gonadal, hormonal, and phenotypic (including genital) sex, each of which has a characteristic defined binary form. Whereas all facets of biological sex are almost always aligned so that assignment of sex at birth is straightforward, rare instances in which two or more facets of biological sex conflict constitute an intersex state, now referred to as disorders (or differences) of sex development (DSDs) (3). In contrast, *gender* is a subjective, malleable, self-identified social construct that defines a person's individual gender role and orientation. Prompted by biological, personal, and societal factors, volitional expression of gender can take on virtually any form limited only by the imagination, with some individuals asserting they have not just a single natal gender but two genders, none, a distinct third gender, or gender that varies (fluidly) from time to time. Hence, whereas gender is usually consistent with biological sex as assigned at birth, in a few it can differ during life. For example, if gender were the basis for eligibility for female sports, an athlete could conceivably be eligible to compete at the same Olympics in both female and male events. These features render the unassailable personal assertion of gender identity incapable of forming a fair, consistent sex classification in elite sports.

The strongest justification for sex classification in elite sports is that after puberty men produce 20 times more testosterone than women (4–7), resulting in circulating testosterone concentrations 15-fold higher than in children or women of any age. Age-grade competitive sporting records show no sex differences prior to puberty, whereas from the age of male puberty onward there is a strong and ongoing male advantage (8). The striking male postpubertal increase in circulating testosterone provides a major, ongoing, cumulative, and durable physical advantage in sporting contests by creating larger and stronger bones, greater muscle mass and strength, and higher circulating hemoglobin as well as possible psychological (behavioral) differences. In concert, these render women, on average, unable to compete effectively against men in power-based or endurance-based sports.

Sex classification in sports therefore requires proof of eligibility to compete in the protected (female) category. This deceptively simple requirement for fairness is taken for granted by peer female competitors who regard participation by males, or athletes with physical features closely resembling males, as unfair. This makes policing of eligibility inescapable for sports, to avoid unfair male participation in female events. However, such policing inevitably intrudes into highly personal matters so that it must be achieved with respect for dignity and privacy, demanding use of the least invasive, scientifically reliable means. Unsurprisingly, this dilemma has always been highly contentious since it first entered international elite sports in the early 20th century, and it has become increasingly prominent and contentious in recent decades; nevertheless, the requirement to maintain fair play in female events will not disappear as long as separate female competitions exist. During recent decades, there has been progressively better understanding of the complex biology of genetic sex determination and the impact of pubertal sexual maturation in establishing phenotypic sexual dichotomy in physical capabilities. These sex-dichotomous physical features form the basis of, but remain quite distinct from, adult gender roles and identity. During the last century, as knowledge grew, the attempts to formalize a scientific basis for the unavoidable necessity of policing eligibility for the female category have been continually challenged. Most recently, the increasing assertion of gender self-identification as a social criterion has further challenged the hegemony of biology for determining “sports sex,” Coleman’s apt term (2). Allowing subjective gender self-identification to become the sole criterion of sports sex would allow for gaming and perceptions of systematic unfairness to grow. The case for women’s sports being defined by sex rather than gender, including the consequences of acceding to gender-based classification, has been outlined (9) in arguing the importance of proper medical

management of athletes intending to compete in female events.

Separate male and female events in sports is a dominant form of classification that is superimposed on other graduated age group and weight classifications (e.g., in weightlifting, power lifting, wrestling, boxing, rowing), which reflect differences in strength, power, and speed to ensure fairness in terms of opportunity to win and, additionally, safety in contact sports. Age and weight classifications rely on objective criteria (birth date, weigh-in weight) for eligibility, and so should sex classification. Nevertheless, some power sports dependent on explosive strength and power (e.g., throwing events, sprinting) do not segregate weight classes, whereas other sports where height is an advantage (e.g., basketball, jockeys) do not have height classifications. These sports disproportionately attract athletes with greater weight and/or power-to-weight ratio or advantageous stature, respectively. If sex classification were eliminated, such open or mixed competitions would be dominated almost exclusively by men. It therefore seems highly unlikely that sex classification would ever be discarded, despite calls on philosophical or sociological grounds to end “gender” classification in sport (10).

Sex Difference in Circulating Testosterone Levels

Testosterone biosynthesis, secretion, and regulation in men and women

An androgen is a hormone capable of developing and maintaining masculine characteristics in reproductive tissues (notably the genital tract, as well as in other tissues and organs associated with secondary sexual characteristics and fertility) and contributing to the anabolic status of nonreproductive body tissues (11). The two dominant bioactive androgens circulating in mature mammals, including humans—testosterone and its more potent metabolite DHT—account for the development and maintenance of all androgen-dependent characteristics, and their circulating levels in men and nonpregnant women arise from steroids synthesized *de novo* in the testes, ovary, or adrenals (12).

The sexually undifferentiated gonads in the embryo develop into either ovaries or testes according to whether a Y chromosome (or at least the *sry* gene) is present. After birth and until puberty commences, circulating testosterone concentrations are essentially the same in boys and girls, other than briefly in the neonatal period of boys when higher levels prevail. The onset of male puberty, a brain-driven process triggered by a still mysterious hypothalamic or higher cerebral mechanism (13), initiates a hormonal cascade. In males, this leads to enhanced pituitary LH secretion that stimulates the 500 million Leydig cells in the testes

to secrete 3 to 10 mg (mean, 7 mg) of testosterone daily (4, 6, 7, 14, 15). This creates a very high local concentration of testosterone within the testis as well as a steep downhill concentration gradient into the bloodstream that maintains circulating testosterone levels at adult male levels, which are tightly regulated by strong negative hypothalamic feedback of circulating testosterone. In the absence of testes, these mechanisms do not function in females. In girls, serum testosterone increases during puberty (16), peaking at age 20 to 25 years before declining gradually with age (17, 18), but it remains <2 nmol/L at all ages, as determined by a reliable method (see below).

In adult women, circulating testosterone is derived from three roughly equal sources: direct secretion from the adrenal gland or the ovary and indirect extraglandular conversion (in liver, kidney, muscle, fat, skin) from testosterone precursors secreted by the adrenal and ovary. Only when circulating testosterone concentrations rise in male adolescents above the prepubertal concentrations does the virilization characteristic of men commence, progress, and endure throughout adult life, at least until old age (18). In combination, these different sources produce ~ 0.25 mg of testosterone daily so that throughout life women maintain circulating testosterone levels of <2 nmol/L. Circulating testosterone concentrations in women are subject to little dynamic physiological regulation. As a result, circulating testosterone concentrations in healthy premenopausal women are stable (nonfluctuating) and not subject to strong negative feedback by exogenous testosterone (as happens in men). Even the small rise (50%) at the time of the mid-cycle LH surge triggering ovulation (19) remains within the physiological range for premenopausal females.

Male and female reference ranges for circulating testosterone

A reliable threshold for circulating testosterone must be set using measurement by the reference method of liquid chromatography–mass spectrometry (LC-MS) rather than using one of the various available commercial testosterone immunoassays. The necessary reliance on steroid mass spectrometry for clinical applications in endocrinology, reproductive medicine, and sports medicine is widely recognized. It has been standard for decades in antidoping science (20), and the growing consensus is that it is required for high-quality clinical research and practice recognized by cognate professional societies (21, 22) and editorials in leading clinical endocrinology (23) and reproductive medicine (24) journals. The inherently limited specificity of testosterone immunoassays arises from antibody cross-reactivity with structurally related steroids (such as precursors and metabolites) other than the intended target. As a result, all steroid immunoassays, including for testosterone, display method-specific bias whereby, for example, the lower limit of a

testosterone reference range in healthy young men varies from 7.3 to 12.6 nmol/L according to the immunoassay used, so that no consensus definition of a lower limit could be obtained independent of the commercial immunoassay method used (25). Furthermore, testosterone immunoassays are optimized for circulating levels in men but display increasing inaccuracy at the lower, by an order of magnitude, circulating testosterone concentrations in women or children. In contrast to immunoassays, LC-MS–based methods are highly specific and do not depend on proprietary antibodies. Using LC-MS–based measurements, method-specific bias can be avoided and a fixed consensus lower reference limit defined (Table 1). Hence, for the precision required in sports medicine, whether for eligibility criteria or antidoping applications, testosterone in serum must be measured by LC-MS methods.

Prior to puberty, levels of circulating testosterone as determined by LC-MS are the same in boys and girls (16). They remain lower than 2 nmol/L in women of all ages. However, from the onset of male puberty the testes secrete 20 times more testosterone resulting in circulating testosterone levels that are 15 times greater in healthy young men than in age-similar women. Using LC-MS measurement, circulating testosterone in adults has a strikingly nonoverlapping bimodal distribution with wide and complete separation between men and women. Table 1 (25–36) summarizes data from appropriate reported studies using mass spectrometry–based methods to measure serum testosterone in healthy men and women. Based on a number-weighted pooling with conventional 95% two-sided confidence limits of the eight available studies using LC-MS measurements of serum testosterone, the reference range for healthy young men (18 to 40 years) is 7.7 nmol/L to 29.4 nmol/L. Similarly, summarizing the nine available studies for healthy menstruating women under 40 years, the 95% (two-sided) reference range is 0 to 1.7 nmol/L. These reference limits do not control for factors such as oral contraceptive use (35, 36), menstrual phase (19), SHBG (37, 38), overweight (39, 40), fasting and smoking (41), diet (40), and physical activity (42, 43) in women and men, all of which have small effects on circulating testosterone but without materially influencing the divergence between the nonoverlapping bimodal distribution of male and female reference ranges of circulating testosterone.

In creating a threshold for eligibility for female events it is also necessary to make allowance for women with polycystic ovary syndrome (PCOS) and nonclassical adrenal hyperplasia. PCOS is a relatively common disorder among women of reproductive ages with a prevalence of 6% to 10%, depending on the diagnostic criteria used (44), in which mild hyperandrogenism is a key clinical feature and has higher than expected prevalence among elite female athletes

Table 1. Serum Testosterone Measurements by LC-MS Methods in Studies of Healthy Men and Women

Study	Sample (Age 18–40 y)	N	Lower 95% CL (nmol/L)	Upper 95% CL (nmol/L)
Men				
Sikaris <i>et al.</i> , 2005 (25)	Elite, eugonadal	124	10.4	30.1
Turpeinen <i>et al.</i> , 2008 (26)	Convenience	30	10.1	31.2
Kushnir <i>et al.</i> , 2010 (27)	Convenience	132	7.2	24.2
Salameh <i>et al.</i> , 2010 (28)	Convenience	264	7.1	39.0
Neale <i>et al.</i> , 2013 (29)	Convenience	67	10.6	31.9
Kelsey <i>et al.</i> , 2014 (30)	Secondary pooled analysis	1058	7.2	25.3
Hart <i>et al.</i> , 2015 (31)	Birth cohort	423	7.4	28.0
Travison <i>et al.</i> , 2017 (32)	Pooled two cohorts	1656	7.9	31.1
Number-weighted mean			7.7	29.4
Women				
Turpeinen <i>et al.</i> , 2008 (26)	Convenience	32	0.8	2.8
Kushnir <i>et al.</i> , 2010 (27)	Convenience	104	0.3	2.0
Salameh <i>et al.</i> , 2010 (28)	Convenience	235	0.03	1.5
Haring <i>et al.</i> , 2012 (33)	Population-based	263	0.04	2.0
Neale <i>et al.</i> , 2013 (29)	Convenience	90	0	1.7
Bui <i>et al.</i> , 2013 (34)	Convenience	25	0.30	1.69
Rothman <i>et al.</i> , 2013 (19)	Convenience	31	0.4	0.92
Bermon and Garnier, 2017 (35)	Elite athletes	1652	0	1.62
Eklund <i>et al.</i> , 2017 (36)	Elite athletes and controls	223	0.26	1.73
Number-weighted mean			0.06	1.68

Abbreviation: CL, confidence limit.

(36, 45–47). Nonclassical adrenal hyperplasia is a milder and later (adult) onset variant of classical congenital adrenal hyperplasia (48) with a much higher but still rare population prevalence (1:1000 vs 1:16,000 for the classical variant) (49). Table 2 (50–64) summarizes clinical studies ($n = 16, \geq 40$ women) reporting serum testosterone concentrations measured by LC-MS in samples from women with PCOS.

The pooled data reveal that the upper limit of serum testosterone in women with PCOS is 3.1 nmol/L (95% CI, one-sided) or 4.8 nmol/L (using a 99.99% CI, one-sided) (Table 3). Hence, a conservative threshold for circulating testosterone of 5 nmol/L measured by LC-MS would identify <1:10,000 women with PCOS as false positives, based on circulating testosterone measurement alone. Circulating testosterone higher than this threshold is likely to be due to testosterone-secreting adrenal or ovarian tumors, intersex/DSD, badly controlled or noncompliant male-to-female (M2F) transgender athletes, or testosterone doping.

The physiological effects of testosterone depend on the circulating testosterone, not its source (endogenous or exogenous)

Testosterone, whether of a natural endogenous or manufactured exogenous source, has an identical chemical structure and biological effects, aside from minor differences in isotopic composition, which are biologically insignificant. At equivalent doses and circulating levels, exogenous testosterone exerts the same biological and clinical effects on every known androgen-responsive tissue or organ as endogenous testosterone, apart from effects on spermatogenesis, which as discussed below is only a matter of degree. Consequently, exogenous testosterone is a fully effective substitute for endogenous testosterone in therapeutic use, countering the effects of testosterone deficiency due to hypogonadism (reproductive system disorders). Any purported differences between endogenous and exogenous testosterone are due to corresponding differences in the endogenous production rate or exogenous dose. Such differences in

Data taken directly from paper or interpolated from other data (e.g., median, quartiles, ranges, sample size) supplied as described by Wan *et al.*, 2014 (Estimating the sample mean and standard deviation from the sample size, median, range and/or interquartile range. BMC Med Res Methodol 14: 135) are shown in italics.

Table 2. Summary of Serum Testosterone (nmol/L) by LC-MS in Women With PCOS From 16 Studies

Study	N	Mean	SD
Moran <i>et al.</i> , 2017 (50)	92	0.24	0.08
Münzker <i>et al.</i> , 2017 (51)	274	0.93	0.19
O'Reilly <i>et al.</i> , 2017 (52)	114	0.55	0.19
Handelsman <i>et al.</i> , 2017 (53)	152	0.38	0.25
Pasquali <i>et al.</i> , 2016 (54)	156	1.17	0.47
Yang <i>et al.</i> , 2016 (55)	1159	2.2	1.44
Tosi <i>et al.</i> , 2016 (56)	116	1.33	0.55
Daan <i>et al.</i> , 2015 (57)	170	1.64	0.53
Bui <i>et al.</i> , 2015 (58)	44	0.85	0.3
Keefe <i>et al.</i> , 2014 (59)	52	1.7	0.97
Yasmin <i>et al.</i> , 2013 (60)	165	1.99	1.02
Janse <i>et al.</i> , 2011 (61)	200	1.12	0.47
Jedel <i>et al.</i> , 2011 (62)	72	0.23	0.08
Legro <i>et al.</i> , 2010 (Mayo) (63)	596	2.12	0.89
Legro <i>et al.</i> , 2010 (Quest) (63)	596	1.98	0.97
Stener-Victorin <i>et al.</i> , 2010 (64)	74	1.53	0.62
Sum	4032		
Number-weighted mean		1.69	0.87

effective exposure lead to corresponding differences in circulating testosterone levels and its effects according to the dose-response curves for testosterone.

Similar to all hormones and drugs, over their effective range of biological activity the dose-response relationship for testosterone is usually a sigmoidal curve with lower and upper plateaus joined by a monotonically rising middle region, which may be linear in the natural scale but more often log-linear (linear on the log or similar transformed scale). In the middle portion of the typical sigmoidal dose-response curve for the same increase in testosterone dose (or concentration), the response would be increased in simple proportional (*i.e.*, linear) but more often on a logarithmic scale. In contrast, at the lower and upper plateaus of dose or concentrations, changes in testosterone exposure may evoke minimal or no response on the endpoint. For example, in women of any age circulating testosterone concentrations are along the lower plateau of the dose-response curve, so that increases in circulating testosterone concentrations within that lower plateau may have minimal or no effect. In female athletes with the mild hyperandrogenism of PCOS, higher performance has been shown (47), with their muscle mass and power performance correlating with androgen levels (36).

However, beyond these effects where endogenous testosterone concentrations are in the high-normal adult female range, it is only when the increases in circulating testosterone concentrations substantially and consistently exceed those prevailing in childhood (<2 nmol/L) and among women including those with PCOS (<5 nmol/L) that the effects would replicate the effects of rising testosterone concentrations of boys in middle to late puberty (typically >8 nmol/L), that is, the masculinizing effects of increased muscle, bone, and hemoglobin characteristics of men. As shown above, the circulating testosterone of most women never reaches consistently >5 nmol/L, a level that boys must sustain for some time to exhibit the masculinizing effects of male puberty.

In addition, the effects of testosterone are modulated in a form of fine tuning by the patterns of exposure, such as whether the circulating testosterone is delivered in the unphysiological steady-state format (*e.g.*, quasi-steady-state delivery by implant or transdermal products) or by the peak-and-trough delivery of injections, as opposed to the natural state of endogenous fluctuations in serum testosterone around the average adult male levels. However, these latter pattern effects are subtle and the dominant effect remains that of dose and average testosterone

concentrations in blood, however they arise. Furthermore, there is evidence that the androgen sensitivity of responsive tissues differs and may be optimal at different circulating testosterone concentrations (65).

Male sexual function is maintained by endogenous testosterone at adult male circulating concentrations. These effects can be replicated by exogenous testosterone if and only if it achieves comparable circulating testosterone concentrations. For example, in a well-controlled prospective study of older men with prostate cancer (66), androgen deprivation achieving castrate levels of circulating testosterone sustained during 12 months markedly suppressed sexual desire and function, whereas those effects did not occur in age-matched men having nonhormonal treatment of prostate cancer or those without prostate cancer. In healthy younger men whose endogenous testosterone was fully suppressed, sexual function completely recovered when circulating testosterone was restored to the physiological male range by administration of exogenous testosterone (67). Similar effects were also observed in healthy, middle-aged men in whom male sexual function was fully maintained (compared with placebo) during 2 years of treatment with an exogenous androgen (DHT) despite that treatment causing sustained, complete suppression of endogenous testosterone (68). This further supports the key interpretation that the biological effects of exogenous or endogenous testosterone are the same at comparable circulating levels.

Clinically, exogenous testosterone replicates fully all effects of endogenous testosterone on every reproductive and nonreproductive organ or tissue, with the sole exception of the testis. Sperm production in the testis requires a very high concentration of testosterone (typically 100-fold greater than in the general bloodstream), which is produced in nature only by the action of the pituitary hormone LH. LH stimulates the Leydig cells in the interstitial space of the testis between seminiferous tubules to produce high intratesticular concentrations of testosterone, which are necessary and sufficient to initiate and maintain sperm production in the adjacent seminiferous tubules. This

high concentration of testosterone also provides a downhill gradient to supply the rest of the body, where circulating testosterone acts on androgen-responsive tissues to produce and maintain masculine patterns of androgenization. When exogenous testosterone (or any other androgen) is administered to men, pituitary LH is suppressed by negative feedback and the sperm production halts for as long as exogenous testosterone or androgen exposure continues, after which it recovers (69). However, even the reduction in spermatogenesis and testis size when men are treated with exogenous testosterone is only a matter of degree. It is well established in rodents (70, 71) that spermatogenesis is induced by exogenous testosterone when the testosterone concentrations in the testis are high enough to replicate what occurs naturally via LH stimulation (72). However, direct replication that high-dose testosterone also initiates and maintains spermatogenesis in humans is not feasible, as these testosterone doses are 10- to 100-fold higher than could be safely given to humans. Nevertheless, confirmatory evidence in humans is available from rare cases of men with an activating mutation of the chorionic gonadotropin/LH receptor (73, 74). This mutation causes autonomous testicular testosterone secretion leading to precocious puberty arising from the premature adult male circulating testosterone concentrations that lead to complete suppression of circulating gonadotropin (LH, FSH) secretion. In this illustrative case the testis was exposed to non-physiologically high testosterone concentrations (but without any gonadotropin stimulation) that induced sperm production and allowed for natural paternity (73). This indicates that even for spermatogenesis, exogenous testosterone can replicate all biological effects of endogenous testosterone in accordance with the relevant dose-response characteristics.

The most realistic view is that increasing circulating testosterone from the childhood or female range to the adult male range will have the same physiological effects whether the source of the additional testosterone is endogenous or exogenous. This is strongly supported by well-established knowledge about the relationship of circulating testosterone concentrations

Table 3. Upper Confidence Limits on Serum Testosterone in Women With PCOS

Confidence Interval	Likelihood ^a	SD ^b	One-Sided ^c	Two-Sided ^c
95%	1:20	1.96	3.13	3.39
99%	1:100	2.35	3.47	3.73
99.9%	1:1000	3.10	4.21	4.39
99.99%	1:10,000	3.72	4.77	4.95

^aLikelihood that a woman with PCOS would exceed that limit by chance.

^bNumber of SDs for each confidence limit.

^cTwo-sided CIs are conventional for a result that could exceed or fall below confidence limits, but here we focus only on values exceeding the upper limit, so that one-sided confidence limits are appropriate.

with the timing and manifestations of male puberty. The characteristic clinical features of masculinization (e.g., muscle growth, increased height, increased hemoglobin, body hair distribution, voice change) appear only if and when circulating testosterone concentrations rise into the range of males at mid-puberty, which are higher than in women at any age even after the rise in circulating testosterone in female puberty. If and only if the pubertal rise in circulating testosterone fails will the males affected be clinically considered hypogonadal. Such a failure of male puberty may occur for genetic reasons (arising from mutations that inactivate any of the cascade of proteins whose activity is critical in the hypothalamus to trigger male puberty) or as a result of acquired conditions, caused by pathological disorders of the hypothalamus or pituitary or functional defects arising from severe deficits of energy or nutrition (e.g., extreme overtraining, undernutrition), with the latter being comparable with hypothalamic amenorrhea or anorexia nervosa in female athletes/ballet dancers. If male puberty fails, testosterone replacement therapy is fully effective in replicating all of the distinctive masculine features apart from spermatogenesis.

Elevated circulating testosterone concentration caused by DSDs

Rare genetic intersex conditions known as DSDs can lead to markedly increased circulating testosterone in women. When coupled with ambiguous genitalia at birth, they may appear as undervirilized males or virilized females. This can cause athletes who were raised and identify as women to have circulating testosterone levels comparable to those of men and greatly exceeding those of non-DSD (and nondoped) women, including those with PCOS. Key congenital disorders in this category are 46,XY DSDs, namely 5 α reductase deficiency (75), 17 β -hydroxysteroid dehydrogenase type 3 deficiency (76), and androgen insensitivity (77, 78), as well as congenital adrenal hyperplasia (79), which is a 46,XX DSD. There is evidence that the first three conditions, components of 46,XY DSDs, are 140-fold more prevalent among elite female athletes than expected in the general population (80).

Genetic 5 α reductase deficiency is due to an inactivating mutation in the 5 α reductase type II enzyme (75). This leads to a deficit of DHT during fetal life when DHT is required for converting the sex-undifferentiated embryonic and fetal tissue to form the sex-differentiated masculine form external genitalia. Although genetic males (46,XY) with 5 α reductase deficiency will develop testes, they usually remain undescended and labial fusion to form a scrotum and phallic growth does not occur. Hence, at birth the external genitalia may appear feminine, leading to a female assigned natal sex. Thus, individuals with 5 α reductase deficiency may have male chromosomal sex

(46,XY), gonadal sex (testes), and hormonal sex (adult male testosterone concentrations), but such severely undervirilized genitalia that affected individuals may be raised from birth as females rather than as undervirilized males. However, from the onset of male puberty, testicular Leydig cells start producing large amounts of testosterone, and the steep rise in circulating testosterone to adult male levels (with the permissive role of 5 α reductase activity) leads to masculine virilization, including male patterns of muscle and bone growth, hemoglobin levels, and other masculine body habitus features (hair growth pattern, voice change), as well as phallic growth (80). Such changes of male puberty prompt around half affected individuals who had female sex assigned at birth and developed as girls prior to puberty to adopt a male gender identity and role at puberty (81). Sperm are formed in the testes so that, using *in vitro* fertilization, these individuals may father children (82).

17 β -Hydroxysteroid dehydrogenase type 3 deficiency (76) has a natural history similar to that of 5 α reductase deficiency. This disorder is due to inactivating mutations in a steroidogenic enzyme expressed only in the testis and that is essential for testosterone formation in the fetus. In the absence of a functional enzyme, the testis makes little testosterone but instead secretes large amounts of androstenedione, the steroid immediately prior to the enzymatic block. In the circulation, the excess of androstenedione is converted to testosterone (mainly by the enzyme AKR1C3) (12). Although the circulating testosterone is then converted to circulating DHT, insufficient DHT is formed locally within the urogenital sinus to virilize genitalia at birth. This causes the same severe undervirilization of the external genitalia of genetically male individuals, leading to ambiguous genitalia at birth despite male chromosomal, gonadal, and hormonal sex. When puberty arrives, the testes start producing the adult male testosterone output. Again, this leads to marked virilization and subsequent assumption of a male gender identity by some affected individuals, conflicting with a female assigned natal sex and childhood upbringing.

Androgen insensitivity, which arises from mutation in the androgen receptor (AR), poses different but complex challenges for eligibility for female athletic events. As the AR is located on the X chromosome, genetic males (46,XY) are hemizygous, so that an inactivating mutation in the AR can be partially or fully insensitive to androgen action. Affected individuals have male internal genitalia (testes in the inguinal canal or abdomen with Wolffian ducts) and consequently adult male circulating testosterone concentrations after puberty. These nonlethal mutations have a wide spectrum of functional effects, ranging from full resistance to all androgen action in complete androgen insensitivity syndrome (CAIS) where individuals have a full female phenotype with

normal female external genitalia, to partial androgen insensitivity syndrome (PAIS) where some androgen action is still exerted, leading to various degrees of ambiguous genitalia, or to mild androgen insensitivity, which produces a very mild, undervirilized male phenotype (normal male genital and somatic development but with little body hair and no male pattern balding) (77). Testosterone (and dihydrotestosterone) have no consistent effect of inducing normal nitrogen retention (anabolic) responses in patients with CAIS (83–86), although some reduced androgen responsiveness is retained by patients with PAIS (84, 87–90). Athletes with CAIS can compete fairly as females because the circulating testosterone, although at adult male levels, has no physiological effect so that, in terms of androgen action and the ensuing physical somatic advantages of male sex, affected individuals are indistinguishable from females and gain no benefits of the sex difference arising from unimpeded testosterone action. A more complex issue arises with athletes having PAIS reflecting the degree of incomplete impairment of AR function. Residual androgen action in such AR mutations is harder to characterize quantitatively, as there is no standardized, objective *in vitro* test to quantify AR functionality. Hence, individuals with PAIS may have adult male circulating testosterone concentrations but variable androgen sensitivity. At present, determination of eligibility to compete in the female category requires a case-by-case evaluation, primarily based on the degree of virilization. The current best available clinical approach to determining the functional impact (degree of functionality/sensitivity) of an AR mutation is based on the degree of somatic, primarily genital, virilization assessed according to the Quigley classification of grade of androgen sensitivity (91).

Congenital adrenal hyperplasia (CAH) is a relatively common defect in adrenal steroidogenesis in the enzymatic pathway, leading to synthesis of cortisol, aldosterone, and sex steroid precursors. The disease varies in severity from life-threatening (adrenal failure) to mild (hirsutism and menstrual irregularity), or even asymptomatic and undiagnosed. The most common mutations causing CAH occur in the 21-hydroxylase enzyme, accounting for 95% of cases (79). The defect leads to a bottleneck, creating a major backing up of precursor steroids that then overflow into other steroid pathways, leading to diagnostic high levels of 17-hydroxyprogesterone and, in female patients, excessive circulating testosterone or other adrenal-source androgen precursors (*e.g.*, androstenedione, dehydroepiandrosterone) that may be converted to testosterone in tissues. A common clinical problem with management of CAH is that glucocorticoid/mineralocorticoid treatment is not always fully effective partly due to variable compliance, which may leave high circulating testosterone, including well into or even above the normal male range (92). It is unlikely

that mild nonclassical congenital adrenal hyperplasia is a major contributor to the mild hyperandrogenism prevalent among elite female athletes. The prevalence of PCOS (6% to 16%) is about 100-fold higher than mild nonclassical congenital adrenal hyperplasia (0.1%) (49), whereas a disproportionately high number of elite female athletes (especially in power sports) have PCOS (45). In one study of hyperandrogenic female athletes, even mild nonclassical adrenal hyperplasia was ruled out by normal 17-hydroxyprogesterone (36) and, in another (47), reported serum androstenedione and cortisol did not differ from controls, ruling out significant congenital adrenal hyperplasia.

Sex Difference in Muscle, Hemoglobin, Bone, and Athletic Performance Relating to Adult Circulating Testosterone Concentrations

Following puberty, testosterone production increases (16) but remains <2 nmol/L in women, whereas in men testosterone production increases 20-fold (from 0.3 mg/d to 7 mg/d), leading to 15-fold higher circulating testosterone concentrations (15 vs 1 nmol/L). The greater magnitude of sex difference in testosterone production (20-fold) compared with circulating levels (15-fold) is due to women's higher circulating SHBG, which retards testosterone clearance, creating a slower circulating half-time of testosterone. This order-of-magnitude difference in circulating testosterone concentrations is the key factor in the sex difference in athletic performance due to androgen effects principally on muscle, bone, and hemoglobin.

Muscle

Biology

It has been known since ancient times that castration influences muscle function. Modern knowledge of the molecular and cellular basis for androgen effects on skeletal muscle involves effects due to androgen (testosterone, DHT) binding to the AR that then releases chaperone proteins, dimerizes, and translocates into the nucleus to bind to androgen response elements in the promoter DNA of androgen-sensitive genes. This leads to increases in (1) muscle fiber numbers and size, (2) muscle satellite cell numbers, (3) numbers of myonuclei, and (4) size of motor neurons (93). Additionally, there is experimental evidence that testosterone increases skeletal muscle myostatin expression (94), mitochondrial biogenesis (95), myoglobin expression (96), and IGF-1 content (97), which may augment energetic and power generation of skeletal muscular activity.

Customized genetic mouse models can provide unique experimental insight into mammalian physiology that is unobtainable by human experimentation.

"Sex differences in height, where they exist, are largely dependent on postpubertal differences in circulating testosterone."

The tight evolutionary conservation of the mammalian reproductive system explains why genetic mouse models have provided consistent, high-fidelity replication of the human reproductive system (98, 99). Genetic males (46,XY) with androgen insensitivity displaying similar features occur through the spontaneous production of inactivating AR mutations in all mammalian species studied, including humans, where they are known as women with CAIS. The converse, genetic females (46,XX) resistant to all androgen action cannot occur naturally in humans or other mammals. This is because fully androgen-resistant females must have both X chromosomes carrying an inactivated AR. In turn, this requires acquiring one X chromosome from their father, and hemizygous males bearing a single X chromosome with an inactive AR produce no sperm, as a functional AR is biologically indispensable for making sperm in any mammal. However, androgen-resistant females can be bred by genetic engineering using the Cre-Lox system (100). An important finding from such studies is that androgen-resistant female mice have essentially the same muscle mass and function as wild-type androgen-sensitive females bearing normal AR, whereas androgen-resistant male mice have smaller and weaker muscle mass and function than do wild-type males and comparable instead with wild-type females (101). This indicates that androgen action, represented by circulating testosterone, is the key determinant of the higher muscle mass and strength characteristic of males compared with females. Furthermore, endogenous circulating testosterone has minimal effects on skeletal muscle mass and strength in female mice because of its low levels. Although these experiments cannot be replicated in humans, their key insight is that the higher circulating testosterone in males is the determinant of the male's greater muscle mass and function compared with females. Nevertheless, there is also evidence that hyperandrogenic women, mostly with PCOS, have increased muscle mass and strength that correlates with mildly increased circulating testosterone in the high-normal female range (36, 47).

Observational data

There is a clear sex difference in both muscle mass and strength (102–104) even adjusting for sex differences in height and weight (104, 105). On average, women have 50% to 60% of men's upper arm muscle cross-sectional area and 65% to 70% of men's thigh muscle cross-sectional area, and women have 50% to 60% of men's upper limb strength and 60% to 80% of men's leg strength (106). Young men have on average a skeletal muscle mass of >12 kg greater than age-matched women at any given body weight (104, 105). Whereas numerous genes and environmental factors (including genetics, physical activity, and diet) may contribute to muscle mass, the major cause of the sex

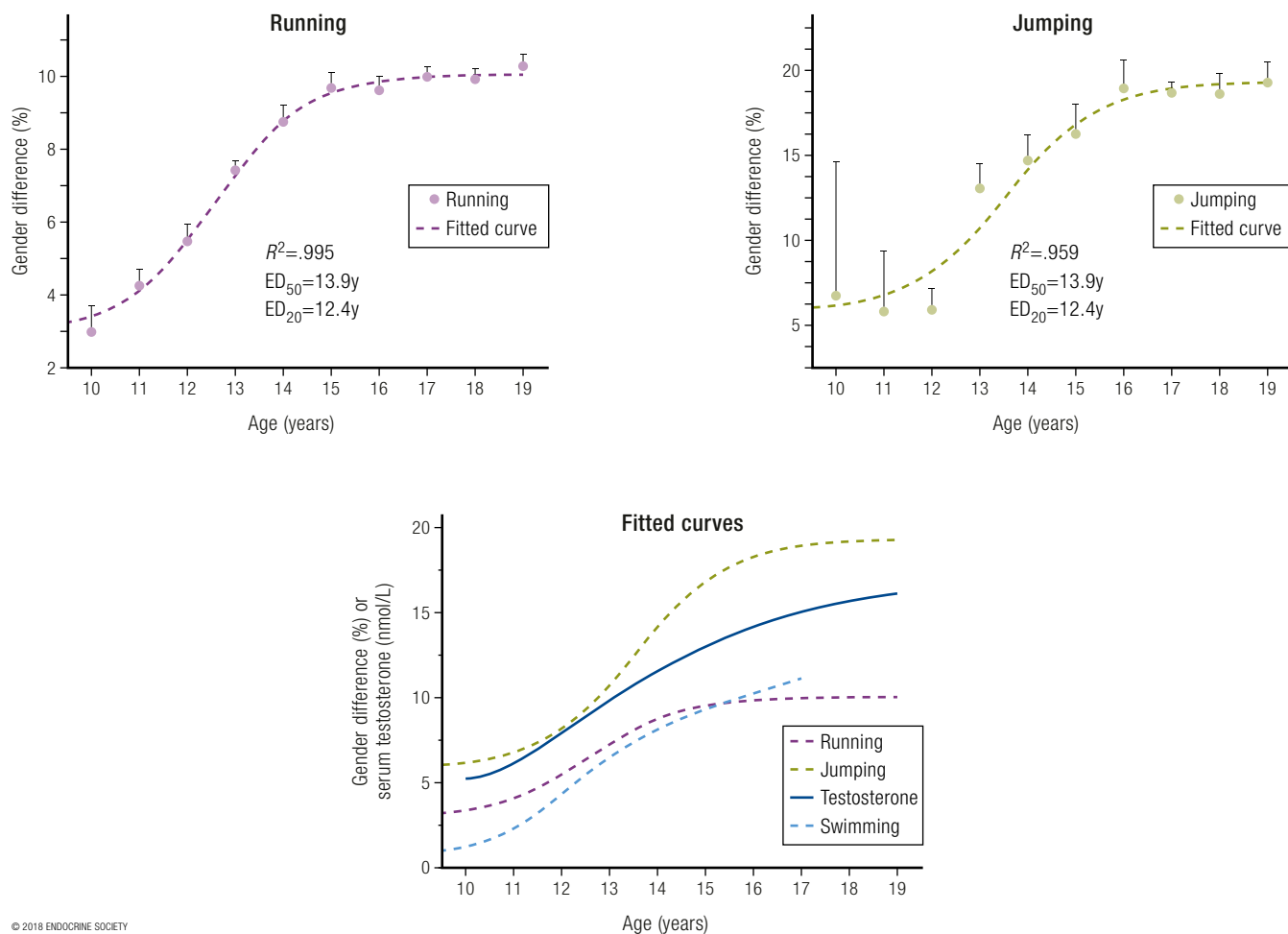
difference in muscle mass and strength is the sex difference in circulating testosterone.

Age-grade competitive sports records show minimal or no female disadvantage prior to puberty, whereas from the age of male puberty onwards there is a strong and ongoing male advantage. Corresponding to the endogenous circulating testosterone increasing in males after puberty to 15 to 20 nmol/L (sharply diverging from the circulating levels that remain <2 nmol/L in females), male athletic performances go from being equal on average to those of age-matched females to 10% to 12% better in running and swimming events, and 20% better in jumping events (8) (Fig. 1). Corroborative findings are provided by a Norwegian study that examined performance of adolescents in certain athletic events but without reference to contemporaneous circulating testosterone concentrations (107). The striking postpubertal increase in male circulating testosterone provides a major, ongoing, cumulative, and durable advantage in sporting contests by creating greater muscle mass and strength. These sex differences render women unable to compete effectively against men, especially (but not only) in power sports.

These findings are supported by studies of non-athletic women showing that muscle mass is increased in proportion to circulating testosterone in women with mildly elevated testosterone levels due to PCOS (108, 109), a condition that is more prevalent among elite female athletes who exhibit these features (36, 45, 47), often undiagnosed (46), but that may provide an ergogenic advantage (47), consistent with the graded effects of circulating testosterone on explosive performance in men and women (110).

Studies of elite female athletes further corroborate these findings. One study demonstrates dose-response effects of better performance in some (400 m running, 400 m hurdles, 800 m running, hammer throw, pole vault) but not all athletic events correlated with significantly higher endogenous testosterone in female, but not male, athletes. Even within the low circulating testosterone levels prevailing within the normal female range, in these events there was a significant advantage of 1.8% to 4.5% among those in the highest tertile compared with the lowest tertile of endogenous testosterone (35). A further study of elite female athletes corroborates and extends these observations in that endogenous androgens are associated with a more anabolic body composition as well as enhanced muscular performance (36). In this study, 106 Swedish Olympic female athletes were compared with 117 age- and weight (body mass index)-matched sedentary control women for their muscle and bone mass (by dual-energy X-ray absorptiometry), their muscular strength (squat and countermovement jumps), and testosterone and DHT, as well as androgen precursors (dehydroepiandrosterone, androstenedione) and urinary androgen glucuronide metabolites (androsterone,

Figure 1. Sex differences in performance (in percentage) according to age (in years) in running events, including 50 m to 2 miles (upper left panel), and in jumping events, including high jump, pole vault, triple jump, long jump, and standing long jump (upper right panel) [for details, see Ref. (8)]. The lower panel is a fitted sigmoidal curve plot of sex differences in performance (in percentage) according to age (in years) in running, jumping, and swimming events, as well as the rising serum testosterone concentrations from a large dataset of serum testosterone of males. Note that in the same dataset, female serum testosterone concentrations did not change over those ages, remaining the same as in prepubertal boys and girls. Data are shown as mean and SEM of the pooled sex differences by age. Reproduced with permission from Handelsman DJ. Sex differences in athletic performance emerge coinciding with the onset of male puberty. *Clin Endocrinol (Oxf)*. 2017;**87**:68–72.



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etiocholanolone, 3 and 17 3α -diols) measured by LC-MS (36). The athletes displayed higher muscle (and bone) mass than did the sedentary control women, with strength tests correlating strongly with muscle mass whether in total or just in the legs. In turn, muscle mass and strength were correlated with androgens and androgen precursors. Considering that such studies may be confounded by factors such as menstrual phase and dysfunction, as well as heterogeneous sports disciplines, which weaken the power of the study, these findings can be regarded as quite robust.

Interventional data

Dose-response studies show that in men whose endogenous testosterone is fully suppressed, add-back administration of increasing doses of testosterone that produce graded increases in circulating testosterone causes a

dose-dependent (whether expressed according to testosterone dose or circulating levels) increase in muscle mass (measured as lean body mass) and strength (65, 111). Taken together, these studies prove that testosterone doses leading to circulating concentrations from well below to well above the normal male range have unequivocal dose-dependent effects on muscle mass and strength. These data strongly and consistently suggest that the sex difference in lean body mass (muscle) is largely, if not exclusively, due to the differences in circulating testosterone between men and women. These findings have strong implications for power-dependent sport performance and largely explain the potent efficacy of androgen doping in sports.

The key findings providing conclusive evidence that testosterone has prominent dose-response effects in men are reported in studies by Bhasin and colleagues that proved a monotonic dose response,

extending from subphysiological to supraphysiological range for men for testosterone effects on muscle mass, size, and strength in healthy young men, findings that have been replicated and confirmed by an independent group (65). Both sets of studies used a common design of fully suppressing all endogenous testosterone (to castrate levels) for the full duration of the experiment by administering a GnRH analog. In the Bhasin and colleagues studies, participants were then randomized to five groups and each received weekly injections of 25 mg, 50 mg, 125 mg, 300 mg, or 600 mg of testosterone enanthate for 20 weeks. In effect, this was two subphysiological and two supraphysiological testosterone doses. In these studies, the lowest testosterone dose produced a mean serum testosterone of 253 ng/dL (8.8 nmol/L) in younger men and 176 ng/dL (6.1 nmol/L) in older men. The studies showed a consistent dose response for muscle mass and strength that was clearly related to testosterone dose and consequential blood testosterone concentrations (Fig. 2, upper panel).

The study of Finkelstein *et al.* (65) involved the same design and involved 400 healthy men aged 20 to 50 years who had complete suppression of endogenous testosterone for the 16 weeks of the study, with testosterone added back using daily doses of 0, 1.25 g, 2.5 g, 5 g, or 10 g of a topical 1% testosterone gel. This again created a graded dose-response curve for serum testosterone and for muscle mass and strength. The inclusion of a 0 (placebo) dose allowed differentiation between the 0 and lowest testosterone dose. The placebo (0) dose produced a serum testosterone of 0.7 nmol/L (the typical mean for castrated men, childhood, and women of any age). Meanwhile, the lowest testosterone dose (1.25 g of gel per day) produced a serum testosterone of 6.9 nmol/L, which is equivalent to that of a male in early to middle puberty. A key finding for this review is that, from this study of men, the increase in serum testosterone from mean of normal female concentration (0.9 nmol/L) to supraphysiological female concentrations (6.9 nmol/L) produced significant increases of 2.3% for total body lean (muscle) mass, 3.0% for thigh muscle area, and 5.5% increase in leg press strength (digitized data pooling of both cohorts from lower panel, Fig. 2).

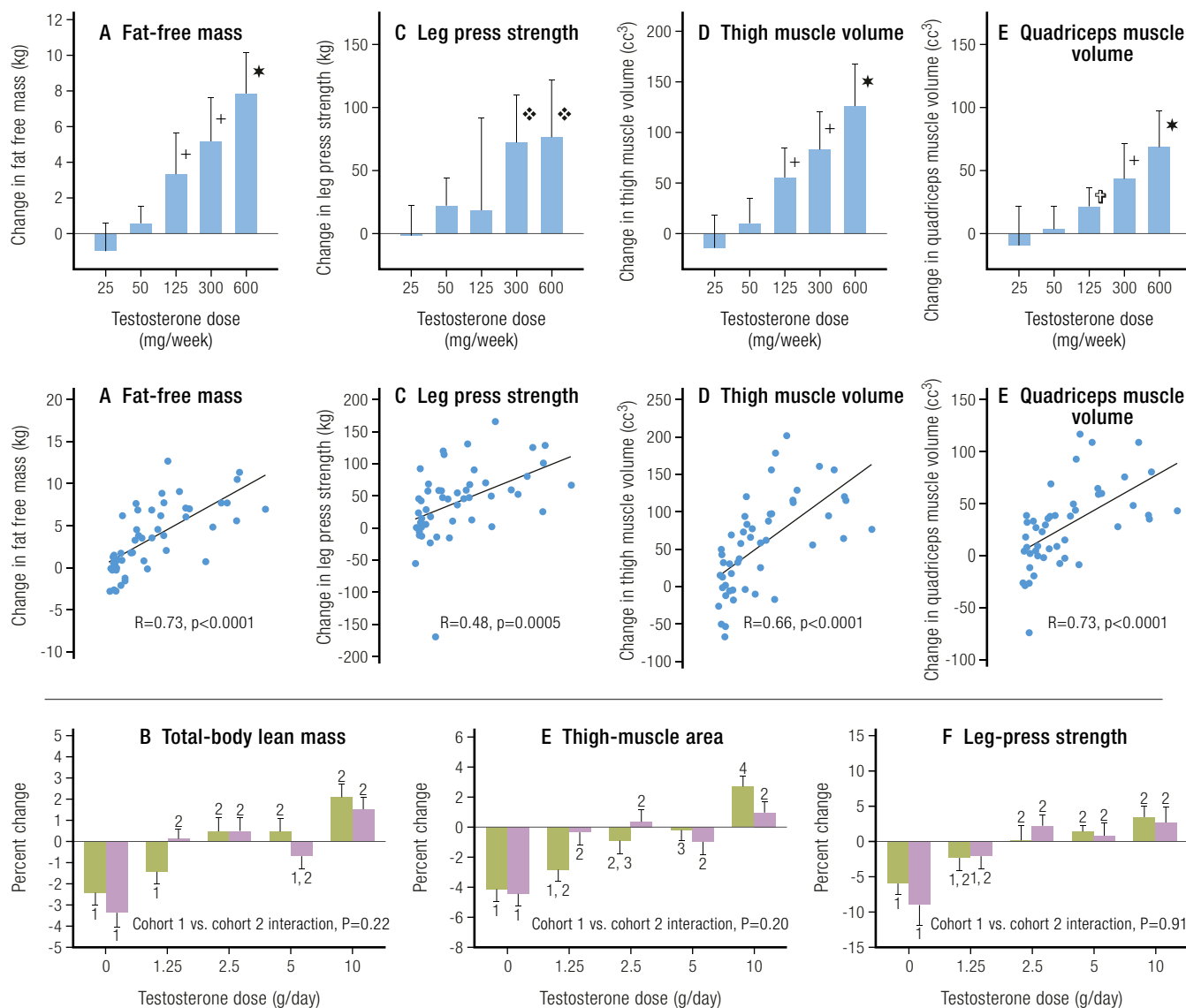
Studies of the ergogenic effects of supraphysiological concentrations of circulating testosterone require studies administering graded doses of exogenous testosterone for months. Owing to ethical concerns regarding risks of unwanted virilization and hormone-dependent cancers, however, few studies have administered supraphysiological testosterone doses to healthy women. One well-designed, randomized placebo-controlled study of postmenopausal women investigated the effects of different testosterone doses on muscle mass and performance and physical function (112). Sixty-two women (mean age, 53 years) all had a standard estrogen-replacement dose administered during a 12-week run-in period (to

eliminate any hypothetical confounding effects of estrogen deficiency), after which they were randomized to one of five groups receiving weekly injections of testosterone enanthate (doses: 0, 3 mg, 6.25 mg, 12.5 mg, and 25 mg, respectively) for 24 weeks. The increasing doses of testosterone produced an expected dose response in serum testosterone concentrations (by LC-MS), with the highest testosterone dose (25 mg/wk) producing a mean nadir concentration of 7.3 nmol/L. The women whose testosterone concentrations were increased to 7.3 nmol/L achieved significant increases in muscle mass and strength (Table 4), ranging from 4.4% for muscle (lean) mass to between 12% and 26% for measures of muscle strength (chest and leg press, loaded stair climb). As muscle strength measurement is effort-dependent, the placebo-controlled design of the Huang *et al.* (112) study supports the further interpretation that the highest dose of testosterone also had prominent mental motivational effects in the effort-dependent tests of muscle strength. These findings provide salient direct evidence of the ergogenic effects of hyperandrogenism in female athletes confirming that at least up to average circulating testosterone concentrations of 7.3 nmol/L, women display a dose-response relationship similar to that of men, with supraphysiological doses of testosterone leading to significant gains in muscle mass and power.

These effects of testosterone administration on circulating testosterone concentrations and muscle mass and strength in females may be compared with the effects in males from the Finkelstein *et al.* (65) and Bhasin and colleagues studies. In men, the lowest testosterone dose (1.25 g/d) increased mean serum testosterone to 6.9 nmol/L (equivalent to levels seen in early to middle male puberty), resulting in significant increases of total body lean (muscle) mass (2.3%), thigh muscle area (3.0%), and leg press strength (5.5%) compared with the placebo dose that resulted in a serum testosterone of 0.7 nmol/L. In the Huang *et al.* (112) study (Fig. 3), muscle mass and strength in postmenopausal women displayed a flat response at the three lower doses, when circulating testosterone concentrations remain <5 nmol/L, and displayed a significant increase only when the mean circulating testosterone concentration produced by the highest testosterone dose first increased circulating testosterone concentrations >5 nmol/L. This pattern, flat at lower doses and rising at the highest dose, represents the lower plateau and the earliest rising portion, respectively, of the sigmoidal dose-response curve of testosterone for muscle.

Data corroborating the Huang *et al.* study results comes from another well-controlled study in which postmenopausal women who were administered methyl testosterone following a run-in period of estrogen replacement displayed a significant increase in lean (muscle) mass as well as upper and lower limb

Figure 2. Strong dose-response relationship between testosterone dose and circulating concentration with muscle mass and strength in men. The upper panels [from Bhasin *et al.* (111)] display the strong dose-response relationships of muscle mass shown as (A) “lean” or “fat-free” mass or volume of (D) thigh and (E) quadriceps muscle and (C) of leg muscle strength with increasing testosterone dose (upper row) or circulating concentration (middle row). Serum testosterone concentrations are in US units (ng/dL; divide by 28.8 to get nmol/L). Adapted with permission from Bhasin S, Woodhouse L, Casaburi R, et al. Testosterone dose-response relationships in healthy young men. *Am J Physiol Endocrinol Metab.* 2001;281:E1172–E1181. The lower panels [from Finkelstein *et al.* (65)] show the strong dose-response relationships of (B) whole-body muscle mass, (E) thigh muscle mass, and (F) leg press strength with increasing testosterone dose. Cohorts 1 and 2 were treated with the same increasing doses of testosterone but either without (green fill, cohort 1) or with (purple fill, cohort 2) an aromatase inhibitor (anastrozole), which prevents conversion of testosterone to estradiol. The differences between cohorts (*i.e.*, use of anastrozole) was not significant for muscle mass and strength and can be ignored with results of the two cohorts being pooled. Reproduced with permission from Finkelstein JS, Lee H, Burnett-Bowie SA, Pallais JC, *et al.* Gonadal steroids and body composition, strength, and sexual function in men. *N Engl J Med* 2013;369:1011–1022.



Data are means +/- Standard Error.
 * Significant differences from all other groups (P < 0.05)
 † Significant difference from 25- and 50-mg doses (P < 0.05)
 ‡ Significant difference from 25-, 50-, and 125-mg doses (P < 0.05)
 § Significant difference from 25-mg dose (P < 0.05)

power during a 16-week double-blind, parallel group study (113).

Similarly, two prospective studies of the first 12 months of treatment of transmen [female-to-male

(F2M) transgender] shows a consistent major increase in muscle mass and strength due to testosterone administration. In one study testosterone treatment of 17 transmen achieving adult male circulating testosterone levels

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Table 4. Effects of Testosterone on Muscle Mass and Strength in Women

Androgen-Sensitive Variable	Baseline	Increase	% Increase
Lean muscle mass, kg	43 ± 6	1.9 ± 0.5	4.4
Chest press, W	100 ± 26	26 ± 7	26
Leg press, N	744 ± 172	90 ± 30	12
Loaded stair-climb power, W	406 ± 77	56 ± 13	14

With data from Huang G, Basaria S, Travison TG, *et al.* Testosterone dose-response relationships in hysterectomized women with or without oophorectomy: effects on sexual function, body composition, muscle performance and physical function in a randomized trial. *Menopause* 2014;21:612–623. Data are shown as mean and SEM derived from Table 1 and digitized from Figure 4 from Huang *et al.* (112) showing the effects of testosterone (mean circulating concentration, 7.3 nmol/L) on muscle mass and strength in women treated with the highest testosterone dose (n = 11; 25 mg of testosterone enanthate per week).

(mean, 31 nmol/L) increased muscle mass by 19.2% (114). In a second study, 23 transmen administered adult male testosterone doses also produced striking increases in total body muscle size and limb muscle size (by 6.5% to 16.6%) and grip strength (by 18%) compared with age-matched untreated control women (115). Conversely, testosterone suppression (using an estrogen-based treatment regimen) in 20 transwomen (M2F transgender) that reduced circulating testosterone levels from adult male range to adult female range led to a 9.4% reduction in muscle mass (measured as cross-sectional area).

Effects on athletic performance

Muscle growth, as well as the increase in strength and power it brings, has an obvious performance-enhancing effect, in particular in sports that depend on strength and (explosive) power, such as track and field events (107, 110). There is convincing evidence that the sex differences in muscle mass and strength are sufficient to account for the increased strength and aerobic performance of men compared with women and is in keeping with the differences in world records between the sexes (116). The basis for the sex difference in muscle mass and strength is the sex difference in circulating testosterone as clearly shown (for example) by (1) the enhanced athletic performance of men compared with prepubertal boys and women (8); (2) the close correspondence of muscle growth (muscle size) with muscle strength in ascending dose studies in men by Bhasin *et al.* (111, 117–119) and Finkelstein *et al.* (65) and in postmenopausal women by Huang *et al.* (112); (3) the effect of male castration in reducing muscle size and strength, effects that are fully rectified by testosterone replacement; and (4) the striking efficacy of androgen doping on the sports performances of German Democratic Republic female athletes (120).

Hemoglobin

Biology

It is well known that levels of circulating hemoglobin are androgen-dependent and consequently higher in men than in women by 12% on average; however, the physiological mechanism by which androgens such as

testosterone boosts circulating hemoglobin is not fully understood (121). Testosterone increases secretion of and sensitivity to erythropoietin, the main trophic hormone for erythrocyte production and thereby hemoglobin synthesis, as well as suppressing hepcidin (122), a crucial iron regulatory protein that governs the body's iron economy. Hepcidin has to balance the need for iron absorption from foods (the only source of iron required for the body's iron-containing proteins) against the fact that the body has no mechanism to shed excess iron, which can be toxic. Adequate iron availability is essential for normal erythropoiesis and synthesis of key heme, iron-containing oxygen-transporting proteins such as hemoglobin and myoglobin (123) as well as other iron-dependent proteins such as cytochromes and DNA synthesis and repair enzymes. Experimental evidence in mice shows that testosterone increases myoglobin content of muscle with potential for augmenting aerobic exercise performance (96), but this has not been evaluated in humans.

Increasing the amount of hemoglobin in the blood has the biological effect of increasing oxygen transport from lungs to tissues, where the increased availability of oxygen enhances aerobic energy expenditure. This is exploited to its greatest effect in endurance sports (1). The experiments of Ekblom *et al.* (124) in 1972 (Fig. 4) demonstrated strong linear relationships between changes in hemoglobin [due to withdrawal or retransfusion of 1, 2 or 3 U (400 mL) of blood] and aerobic capacity, established by repeated testing of maximal exercise-induced oxygen consumption before and after each procedure (124). As already noted, circulating hemoglobin levels are on average 12% higher in men than women (125). It may be estimated that as a result the average maximal oxygen transfer will be ~10% greater in men than in women, which has a direct impact on their respective athletic capacities.

Observational data

The proposition that the sex difference in circulating hemoglobin levels is likely to be due to the sex difference in average circulating testosterone concentrations is supported by the fact that male castration (*e.g.*, for advanced prostate cancer) (126) and androgen deficiency due to reproductive system disorders (127) reduce circulating

hemoglobin in men, eliminating the sex difference, whereas testosterone replacement therapy restores circulating hemoglobin to adult male levels (121, 127, 128).

An unusually informative observational study of women with CAH provides unique insight into testosterone effects on circulating hemoglobin in otherwise healthy women (92). Women with CAH require glucocorticoid replacement therapy but exhibit widely varying levels of hormonal control (79). The degree of poor control is associated with increasing levels of circulating testosterone ranging from normal female concentrations up to 36 nmol/L, and these levels correlate closely ($r = 0.56$) with levels of circulating hemoglobin (Fig. 5). Interpolating from the dose-response regression, increases in circulating testosterone measured by LC-MS from 0.9 nmol/L to 5 nmol/L, 7 nmol/L, 10 nmol/L, and 19 nmol/L were associated with increases in circulating hemoglobin of 6.5%, 7.8%, 8.9%, and 11%, respectively, establishing a strong dose-response relationship. An 11% increase in circulating hemoglobin translates to a 10% difference in maximal oxygen transfer (124), which may account for virtually all the 12% sex difference in male and female circulating hemoglobin (125). To put this into context, any drug that achieved such increases in hemoglobin would be prohibited in sports for blood doping, as this difference is sufficient to have ergogenic effects, even without taking into account any testosterone effects on muscle mass or strength (for which data were not available in that study). Conversely, among elite female athletes with circulating testosterone in the healthy premenopausal female range, circulating hemoglobin does not correlate with athletic performance (35). In women with the mild hyperandrogenism of PCOS, circulating hemoglobin and hematocrit are reported as not (129) or marginally increased (130), findings that may be influenced by the fact that PCOS is

associated with reduced or absent menstruation, thereby reducing the iron loss of regular menstruation.

Interventional data

In the Bhasin *et al.* (111) studies, in both young and older men the highest testosterone dose produced a 12% increase in blood hemoglobin compared with the lowest dose, reflecting a strong dose-response relationship (Fig. 6) (131). Analogous findings were reported for testosterone treatment effects in postmenopausal women where the highest dose (25 mg weekly) of testosterone, which increased mean serum testosterone to 7.3 nmol/L, had the largest increase (3%) in blood hemoglobin and hematocrit (112).

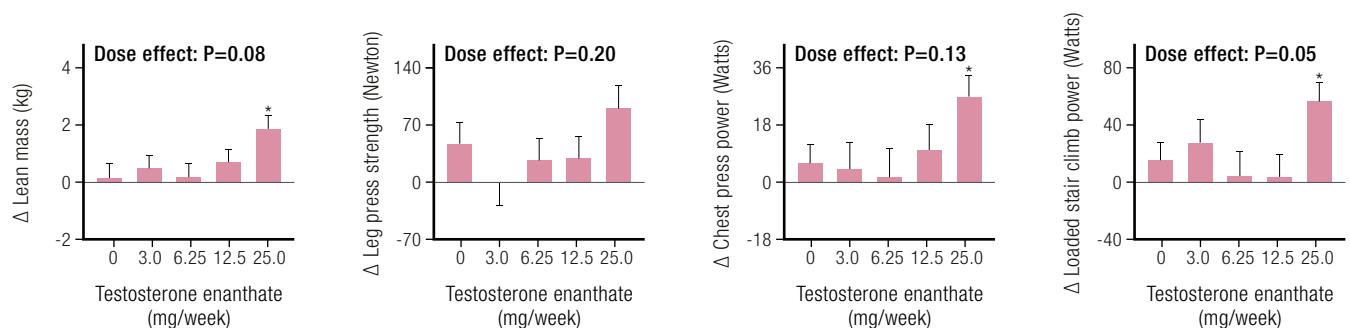
Corroborative findings are available from studies of transmen (F2M transgender), that is, natal females who subsequently receive testosterone treatment at replacement doses to create adult male circulating testosterone concentrations, who exhibit increases in circulating hemoglobin to male levels [reviewed in (132–134)]. Testosterone treatment in 17 (F2M) transmen that created mean circulating testosterone levels of 31 nmol/L also increased hemoglobin levels by 15% (114). Conversely, one prospective 12-month study of transgender (nonathlete) individuals reported that testosterone suppression (by an estrogen-based regimen) to normal female levels in 20 (M2F) transwomen reduced hemoglobin by 14%.

If such an increase in hemoglobin were produced by any chemical substance, it would be considered doping, according to the World Anti-Doping Code.

Bone

Biology

There is extensive experimental evidence from genetic mouse models showing that the sex differences in bone

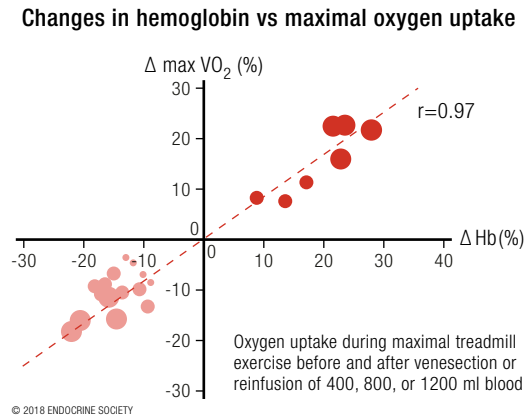


* Significant difference between mean on treatment change in dose group vs. placebo at 0.05 level. The significance level for the overall dose effect is by likelihood ratio test.

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Figure 3. From Huang *et al.* (112): Dose-response effects on lean (muscle) mass and three measures of muscle strength as a result of increasing doses of weekly testosterone enanthate injections in women. Note the effects on all four parameters (three statistically significant) of the highest testosterone dose, the only one that produced circulating testosterone levels exceeding the normal female range. Reproduced with permission from Huang G, Basaria S, Travison TG, *et al.* Testosterone dose-response relationships in hysterectomized women with or without oophorectomy: effects on sexual function, body composition, muscle performance and physical function in a randomized trial. *Menopause* 2014;21:612–623.

Figure 4. Redrawn results from Ekblom *et al.* (124). Results from the transfusion of additional blood are shown in dark red circles and those after blood withdrawal in light red circles. Adapted with permission from Ekblom B, Goldbarg AN, Gullbring B. Response to exercise after blood loss and reinfusion. *J Appl Physiol* 1972;33:175–180.



size, mass, and function are due to the sex difference in circulating testosterone. These effects have been reported from studies of global and tissue or cell-selective inactivation of ARs or estrogen receptors that show that androgen effects are mediated by both direct effects on the AR as well as indirect effects mediated via aromatization of testosterone to estradiol to act on estrogen receptors [reviewed in (135)]. Bone grows in length due to epiphyseal chondral growth plates that provide cartilage, forming the matrix for lengthening of long bone, which is terminated by an estrogen-dependent mechanism that depends on aromatization of testosterone to estradiol. Similarly, bone width and density are increased through appositional growth from periosteal and endosteal expansion that depend on bone loading and androgen exposure together with other factors. An important difference between androgen effects on bone compared with effects on muscle or hemoglobin is that developmental bone effects of androgens are likely to be irreversible.

Observational data

Men have distinctively greater bone size, strength, and density than do women of the same age. As with muscle, sex differences in bone are absent prior to puberty but then accrue progressively from the onset of male puberty due to the sex difference in exposure to adult male circulating testosterone concentrations [reviewed in (135)]. The earlier onset of puberty and the related growth spurt in girls as well as earlier estrogen-dependent epiphyseal fusion explains shorter stature of girls than boys. As a result, on average men are 7% to 8% taller with longer, denser, and stronger bones, whereas women have shorter humerus and femur cross-sectional areas being 65% to 75% and 85%, respectively, those of men (106).

These changes create an advantage of greater bone strength and stronger fulcrum power from longer bones. Additionally, whereas passing through puberty enhances male physical performance, the widening of the female pelvis during puberty, balancing the evolutionary demands of obstetrics and locomotion (136, 137), retards the improvement in female physical performance, possibly driven by ovarian hormones rather than the absence of testosterone (138, 139).

Sex differences in height have been the most thoroughly investigated measure of bone size, as adult height is a stable, easily quantified measure in large population samples. Extensive twin studies show that adult height is highly heritable with predominantly additive genetic effects (140) that diverge in a sex-specific manner from the age of puberty onwards (141, 142), the effects of which are likely to be due to sex differences in adult circulating testosterone concentrations.

Bone density (total and medullary cross-sectional area) is increased in women with CAH with variably elevated serum testosterone (including into the male range) when it is only partially suppressed by glucocorticoid treatment (143), although more effective glucocorticoid suppression lowers bone density (144).

Interventional data

Well-designed, placebo-controlled direct interventional studies of supraphysiological androgen effects on bone in females are few, rarely feasible, and unlikely to be performed for ethical and practical reasons. Unlike muscle, which responds relatively rapidly to androgen effects so that muscle studies in humans can be completed within 3 to 4 months (65, 111, 112, 119, 145), comparable bone studies would typically take a year or more to reach plateau effects. Hence, such direct investigational studies in otherwise healthy women would risk side effects of virilization that may be only slowly and partly reversible, if at all, as well as potential promotion of hormone-dependent cancers making such studies ethically and practically not feasible.

Effects on athletic performance

The major effects of men's larger and stronger bones would be manifest via their taller stature as well as the larger fulcrum with greater leverage for muscular limb power exerted in jumping, throwing, or other explosive power activities. The greater cortical bone density and thereby resistance to long bone fractures is unlikely to be relevant to the athletic performance of young athletes, in whom fractures during competition are extremely rare and not expected to be linked to sex. Alternatively, stress fractures in athletes, mostly involving the legs, are more frequent in females with the male protection attributable to their larger and thicker bones (146).

Other androgen-sensitive sex dichotomous effects

Biology and observational data

Many if not most other aspects of physiology exhibit sex differences and may therefore enhance the impact of the male advantage in sports performance of the dominant determinants (muscle and hemoglobin). Examples include sex differences in exercise-induced cardiac (147, 148) and lung (149) function and mitochondrial biogenesis and energetics (95). However, the limited knowledge of the magnitude and hormonal mechanisms involved, specifically the degree of androgen dependence of these mechanisms, means that it is difficult to estimate their contribution, if any, toward the sex difference in athletic performance. The sex difference in pulmonary function may be largely explained by the androgen-sensitive sex difference in height, which is a strong predictor of lung capacity and function (149). Further physiological studies of the androgen dependence of other physiological sex differences are awaited with interest.

Psychological differences between men and women on mental function (*e.g.*, rotational orientation) (150) as well as mood, motivation, and behavioral effects may involve androgen-sensitive effects during prenatal and perinatal as well as postpubertal effects (151, 152).

Interventional data

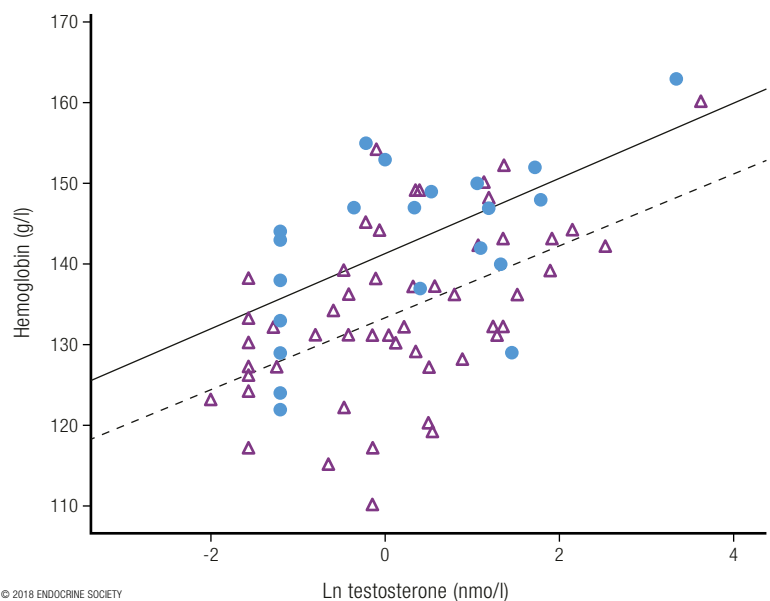
There is some limited direct evidence from well-designed, placebo-controlled trials that administration of testosterone or other androgens at supraphysiological doses directly affect mood and behavior, notably inducing hypomania (153). In a randomized placebo-controlled study of testosterone administration in postmenopausal women (112), in case of those receiving the highest dose (the only one causing circulating testosterone levels to exceed the normal female range), there was not only an increase in muscle mass (4.4%) but a strikingly greater increase in muscle strength (12% to 26%), suggesting an enhanced mental motivational effect of testosterone on the effort-dependent tests of muscle strength.

Alternative Mechanisms Proposed to Explain Sex Differences in Athletic Performance

Alternative explanations for the sex difference in athletic performance, other than it being due to the sex difference in postpubertal circulating testosterone, have been proposed, including (1) sex differences in height because height is a predictor of muscle mass (116), (2) genetic sex differences due to the influence of unspecified Y chromosome genes (154), and (3) sex differences in GH secretion (116).

Effects of height

One proposal has been that, as men are taller than women, height differences may explain the sex differences in muscle mass and function, which explains some athletic success (116). Numerous factors contribute to the regulation of adult muscle mass, including genetics, race, adiposity, hormones, physical activity (exercise/training), diet, birth order, and bone size (including height) [reviewed in (155)]. Among the nonhormonal factors, genetics explains a large proportion [\sim 50% to 60% from pooled twin studies (156)] of the variability in muscle mass and strength (157, 158) and may be explained in turn by the equally high genetic contributions to circulating testosterone (37, 38). Some factors influencing muscle mass and strength such as physical activity, adiposity, and bone size are also partly androgen-dependent. Prior to puberty there is no sex difference in skeletal features, including height (159, 160). However, with the onset of puberty, girls aged 11 and 12 years are transiently taller than peer-aged boys due to their earlier onset of the female pubertal growth spurt, but from the age of 14 years onward the taller stature in males emerges and stabilizes (141). Hence, similar to muscle mass, sex differences in bone size (including length, density, and height) arise after male puberty establishes the marked dichotomy between men and women in adult circulating testosterone concentrations. Taller height is



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Figure 5. Plot of circulating hemoglobin against the natural logarithm of serum testosterone in women with congenital adrenal hyperplasia [from Karunasena *et al.* (92)]. The filled circles represent a cohort where serum testosterone was measured by immunoassay. The open triangles denote a second cohort, where serum testosterone was measured by LC-MS. Note the systematic overestimation of testosterone by the immunoassay used in cohort 1 vs LC-MS measurement in cohort 2. Despite that overestimation, however, the correlations were similar in both cohorts. Reproduced under a Creative Commons BY-NC-ND 4.0 license from Karunasena N, Han TS, Mallappa A, *et al.* Androgens correlate with increased erythropoiesis in women with congenital adrenal hyperplasia. *Clin Endocrinol (Oxf)* 2017;86:19–25.

advantageous in some sports (basketball, some football codes, combat sports), but in others (horse racing jockeys, cycling, gymnastics, weightlifting, bodybuilding) short stature provides a greater power/strength-to-weight ratio as well as superior rotational balance, speed, and agility. However, the male advantages in speed, strength, and endurance apply regardless of whether height is advantageous. Hence, the sex differences in height, where they exist, are largely dependent on postpubertal differences in circulating testosterone when sex differences in height are first expressed.

Genetic effects of Y chromosome

It has also been proposed that the sex difference in athletic performance may be due to genetic effects of an unspecified Y chromosome gene that may dictate taller stature (154), as height is correlated with men's greater muscle mass. The small human Y chromosome has few functional genes and none with a known effect on height other than the short stature homeobox (SHOX) gene, located in the pseudoautosomal regions of the tip of the short arms of X and Y chromosomes (161). Adult height displays an apparent dose dependency on SHOX gene copy number that is a major factor contributing to explaining both the short stature of 45,XO females (Turner syndrome), who have a single copy of the SHOX gene, as well as the tall stature of 47,XXY males (Klinefelter syndrome), who have three copies (161). However, when SHOX copy number is the same, men with additional supernumerary Y chromosomes (e.g., 47,XYY) are the same height as 47,XXY men (162). Hence, there is no evidence supporting dosage-dependent Y chromosomal gene effects on height independent of SHOX gene copy number, nor does men's possession of a Y chromosome explain the height difference between adult men and women. On the contrary, the tall stature of 47,XXY men is at least partly due to the concomitant androgen deficiency leading to pubertal

delay. Pubertal delay prolongs long bone growth due to delayed epiphyseal closure, an estrogen-dependent effect that requires adequate production of testosterone as a substrate for aromatization to estradiol, resulting in tall stature. Similar eunuchoidal features and taller stature are evident in 46,XY men with congenital hypogonadotropic hypogonadism (Kallmann syndrome and its variants) with comparable congenital onset of androgen deficiency, also manifest as pubertal delay and long bone overgrowth. Hence, taller height is better explained by impaired testicular function with delayed puberty and epiphyseal closure rather than unspecified Y chromosome dosage effects. In any case, rare aneuploidies in themselves do not explain the sex difference in height in the general population of individuals with normal sex chromosomes.

Growth hormone

The proposal that the sex difference in muscle mass and function might be due to sex differences in endogenous GH secretion (116) is refuted by the extensive and conclusive clinical evidence that endogenous GH secretion in young women is consistently higher (typically twice as high) as in young men of similar age (163–170). Those findings cannot explain the male advantage in muscle mass and strength unless GH retards muscle growth/function, for which there is no evidence. Furthermore, estrogens inhibit GH-dependent, hepatic IGF-1 production, the major pathway of GH action (171, 172). The weak observational association between low circulating IGF-1 and some, but not other, measures of weak muscle strength and limited mobility among older women may reflect general age-associated debility rather than any specific hormonal effects (173). Finally, the evidence that endogenous GH plays no role in sex differences in muscle mass and function is supported by evidence from the most extensive interventional study of GH treatment to non-GH-deficient adults, daily GH administration for 8 weeks to healthy recreational athletes produced only marginally significant improvement in exercise performance of men and none in women (174). These findings are consistent with the speculation that GH (or IGF-1) may be an amplifier of testosterone effects and therefore be a consequence of the sex difference in circulating testosterone rather than its cause.

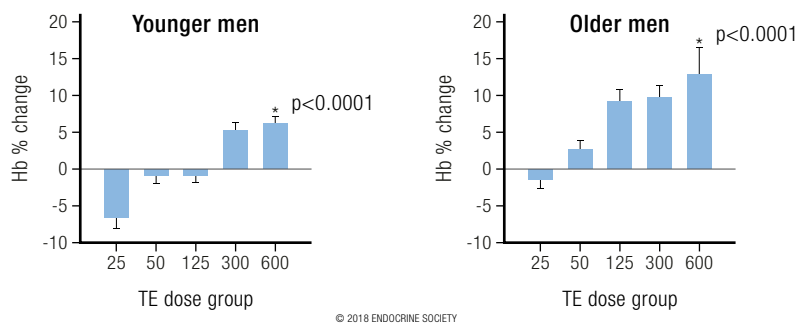


Figure 6. From Coviello *et al.* (131): Depicts the strong dose-response relationship between increasing testosterone dose with resulting change in blood hemoglobin in young and older men. Reproduced with permission from Coviello AD, Kaplan B, Lakshman KM, *et al.* Effects of graded doses of testosterone on erythropoiesis in healthy young and older men. *J Clin Endocrinol Metab* 2008;93:914–919.

The Impact of Adult Male Circulating Testosterone Concentrations on Sports Performance

Plausible estimates of the magnitude of the ergogenic advantage of adult male circulating testosterone concentrations are feasible from the limited available observational and interventional studies.

Population data on the ontogeny of puberty show that prior to puberty boys and girls have comparable athletic performance, whereas sex differences in athletic performance emerge coinciding with the rise in circulating testosterone from the onset of male puberty. Male puberty results in circulating testosterone concentrations rising from the prepubertal and female postpubertal range (<2 nmol/L) to adult male circulating testosterone concentrations (18). This is associated with a 10% to 12% better performance in running and swimming events and 20% enhancement in jumping events (8).

A minimal estimate of the impact of adult male testosterone concentrations on muscle size and strength in females is provided by the Huang *et al.* (112) study of postmenopausal women. In this study the highest testosterone dose (weekly injections of 25 mg of testosterone enanthate) increased mean circulating testosterone from 0.9 nmol/L to 7.3 nmol/L, which is equivalent to the circulating testosterone of boys in early to middle puberty. After 24 weeks of testosterone treatment, the increase in circulating testosterone concentrations led to significant increases in muscle size of 4.4% and in muscle strength of 12% to 26%. Given the limited testosterone dose (and concentration) as well as study duration, it is likely that these findings underestimate the magnitude of the impact that sex difference in circulating testosterone has on muscle mass and strength, and therefore on athletic performance.

Converse effects of reduced athletic performance in athletes who undergo suppression of circulating testosterone concentrations from those in the male into the female range have been reported. Among recreational (nonelite) athletes, an observational study showed a consistent deterioration in athletic performance of transwomen (M2F transgender) athletes corresponding closely to the suppression of circulating testosterone concentrations (175). Similarly, among elite athletes with circulating testosterone in the male range due to DSDs, comparable findings of athletic performance reduced by an average of 5.7% when circulating testosterone was suppressed from the male range to <10 nmol/L (176). Subsequently, when the IAAF hyperandrogenism rule was suspended in 2015, and so these elite athletes could train and compete with unsuppressed serum testosterone levels, their athletic performances increased by a similar amount. Additionally, circulating hemoglobin levels in these untreated DSD athletes were comparable with male athletes or with female athletes doping with erythropoietin (Fig. 7). However, when circulating testosterone was suppressed to <10 nmol/L the levels of circulating hemoglobin were 12% lower and again comparable with nondoped, non-DSD females, corresponding to the 12% magnitude of the sex difference in hemoglobin between men and women (125).

Congruent findings are also known for an elite female athlete whose serial athletic performance based on publicly available best annual times between 2008 and 2016 for the 800-m running event are depicted in relationship to the original 2011 IAAF hyperandrogenism regulation (Fig. 8).

Based on the established dose-response relationships, suppression of circulating testosterone to <10 nmol/L would not eliminate all ergogenic benefits of testosterone for athletes competing in female events. For example, according to the Huang *et al.* (112) study, reducing circulating testosterone to a mean of 7.3 nmol/L would still deliver a 4.4% increase in muscle size and a 12% to 26% increase in muscle strength compared with circulating testosterone at the normal female mean value of 0.9 nmol/L. Similarly, according to the Karunasena *et al.* (92) study, reducing circulating testosterone concentration to 7 nmol/L would still deliver 7.8% more circulating hemoglobin than the normal female mean value. Hence, the magnitude of the athletic performance advantage in DSD athletes, which depends on the magnitude of elevated circulating testosterone concentrations, is considerably greater than the 5% to 9% difference observed in reducing levels to <10 nmol/L.

The physiological mechanism underlying these observations is further strengthened by prospective controlled studies of initiation of cross-sex hormone treatment in transgender individuals (114, 177). These show that during the first 12 months muscle mass (area) was decreased by 9.4% and hemoglobin levels by 14% in 20 transwomen (M2F transgender) treated with an estrogen-based regimen that reduced circulating testosterone concentrations from the male range to the female range. Conversely, in 17 transmen (F2M transgender) treated for the first time with testosterone for 12 months (which increased circulating testosterone levels to a mean of 31 nmol/L), muscle mass increased by 19.2% and hemoglobin by 15% (114). The muscle mass findings remained stable between 1 and 3 years after initiation of treatment, although fat mass continued to change between 1 and 3 years of testosterone treatment (177). These studies did not report muscle strength, but other studies of testosterone dose-response relationships for muscle mass and strength show consistently positive correlation (65, 93, 117, 119), although with disproportionately greater effect on muscle strength than on muscle mass. Hence, the muscle mass estimates in these prospective treatment initiation studies in transgender individuals likely underestimate the muscle strength gains from elevated testosterone levels where the circulating testosterone markedly exceeds female range to be within the male range as occurs in severe hyperandrogenism of DSD females, poorly controlled transwomen (M2F transgender), or transmen (F2M transgender). These effects are also the biological

basis of the ergogenic efficacy of androgen doping in women.

Finally, to put these competitive advantages into context, the winning margin (the difference in performance by which a competitor misses a gold medal, any medal, or making the final) in elite athletic or swimming events during the last three Olympics is <1% equally for both male and female events (Table 5).

Gaps in Knowledge and Research Limitations

The major limitations on scientific knowledge of the impact of adult male circulating testosterone concentrations on the sex difference in athletic performance is the lack of well-designed studies. Ideally, these would need to replicate adult male circulating testosterone concentrations for sufficient time in women to investigate the effects on muscle, hemoglobin, bone, and other androgen-sensitive measures that display consistent sex dichotomy in the population. However, the ethical and safety concerns preventing such studies hitherto are likely to remain formidable obstacles due to the risk of unacceptable and potentially irreversible virilization as well as of promoting hormone-dependent cancers in women.

With the exception of one interventional study administering a relatively low testosterone dose (*i.e.*, low for males) to women (112), the available evidence comprises observational studies that can only examine the effects of serum testosterone within physiological female limits or sparse and mostly uncontrolled data from intersex/DSD athletes. Although the available observational findings in healthy females are informative, the key question is the magnitude and dose

response of effects at still higher circulating testosterone concentrations on the performances of women. Whereas a testosterone dose-response relationship has been established in women at relatively low (for men) testosterone dose and circulating concentrations, it remains unproven (even if clearly plausible) that the testosterone dose-response relationships established in men for muscle, hemoglobin, and bone can be extrapolated to women when they are exposed to higher circulating testosterone concentrations (*i.e.*, comparable with male levels). It is theoretically possible there could be differences between men and women in muscle responses to testosterone, as muscle cell populations might express genetic differences in androgen sensitivity (for which there are no data), or alternatively the long-term prior pattern of testosterone exposure from conception to adulthood might lead to differences in testosterone dose responsiveness after maturity. Although the dose-response relationship in women may be similar to what is seen in men, there is also anecdotal evidence that the dose-response curves may be left shifted so that testosterone has greater potency in women than in men at comparable doses and circulating levels. The prediction is supported by the anecdotal evidence from the surreptitious East German national doping program in which the supervising doctors asserted from their experience of illicit cheating that androgens had more potent ergogenic effects in women than in men (120), a speculative opinion shared by many experienced sports medicine physicians.

There is no known means of increasing endogenous testosterone in women to anything like the requisite degree to attempt to answer these questions. In healthy men, circulating testosterone originates almost exclusively from a single source (testicular Leydig cells) and is subject to tight hypothalamic negative feedback control, so that either direct stimulation (by human chorionic gonadotropin) or indirect reflex effects (*e.g.*, from estrogen blockers operating via negative feedback) to enhance Leydig cell testosterone secretion are feasible. However, similar mechanisms do not operate in women, in whom circulating testosterone originates from three different sources (adrenal, ovary, extraglandular conversion of androgen precursors), none of which is subject to tight testosterone negative feedback control. As a result, it is not feasible to produce a sufficient increase in circulating testosterone in women either by direct ovarian stimulation or indirect reflex effects to test this hypothesis even if doing so were deemed ethical and safe. Alternatively, carefully controlled, graded-dose studies in F2M transgender individuals might be informative but are largely lacking at this time.

Hence, the only feasible design of such studies would be testosterone (or another androgen) administration to healthy young women. The only well-designed, placebo-controlled study of testosterone in

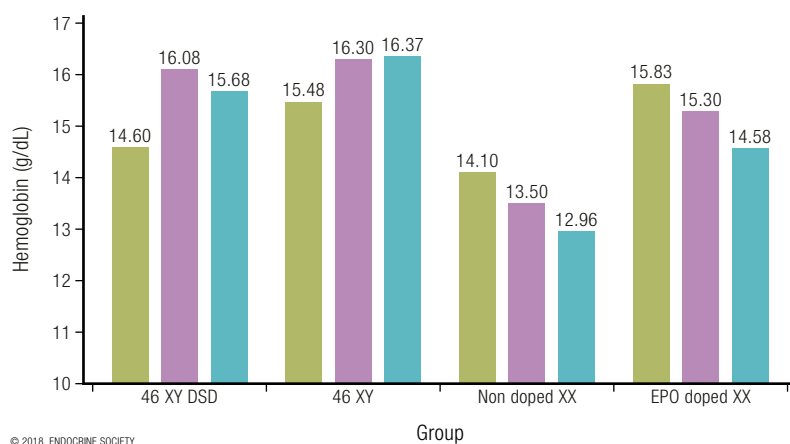


Figure 7. Mean hemoglobin concentrations (g/dL) of 12 elite athletes in 4 groups of 3 XY or XX middle-distance runners. The hemoglobin concentrations were collected as a part of the Athlete Biological Passport and analyzed according to the World Anti-Doping Agency standard methods. Each bar (athlete) is the mean of a minimum of three blood samples. In the 46,XY DSD group, blood was collected in a period when the athlete was not undergoing hormonal suppressive treatment.

otherwise healthy postmenopausal women was restricted to relatively low testosterone doses that, although clearly supraphysiological for women, were only 20% to 25% of male testosterone replacement doses (112). We are currently performing a double-blind, randomized, placebo-controlled study of the effects of moderately increased testosterone concentration on physical performance and behavior in young healthy women (ClinicalTrials.gov no. NCT03210558). However, obtaining ethical approval to administer supraphysiological testosterone doses that maintain circulating testosterone in the male range for sufficiently prolonged periods, as well as the practical difficulties in recruitment, are likely to remain obstacles to definitive resolution of this question.

In men, analogous ethical concerns over short- and long-term adverse effects delayed the definitive studies of supraphysiological testosterone doses to healthy young and older men but were eventually overcome. This was despite the fact that, uniquely among hormones, there is no known disease state in men due to pathologically excessive testosterone secretion. In contrast, in women, supraphysiological testosterone effects are known to produce virilization side effects that may be only slowly and partially, if at all, reversible. However, maintaining clearly supraphysiological testosterone concentrations would require treatment of months (muscle) or years (bone) and would replicate not only a known hyperandrogenic disease state (PCOS) but also potentially increasing risk of hormone-dependent cancers. In these circumstances, it could only be justifiable to replicate in women the salient testosterone dose-response studies available from men if the available evidence of dose-response relationship in men was not sufficiently convincing and/or there was reason to think that these dose-response characteristics would be substantially different in women. Overall, the unequivocal dose-response evidence in men together with the available overlap evidence in women appears sufficiently persuasive, so that it is doubtful that women would respond differently from men if their circulating testosterone levels were raised to the male range. More broadly, there is no more reason to require separate studies in women vs men than there is for every different ethnic subgroup of people. An aesthetic preference for splitting categories is not a sound reason to require the virtually impossible standard of establishing fresh and comprehensive empirical evidence in women of testosterone dose-response effects ranging into male circulating testosterone concentrations.

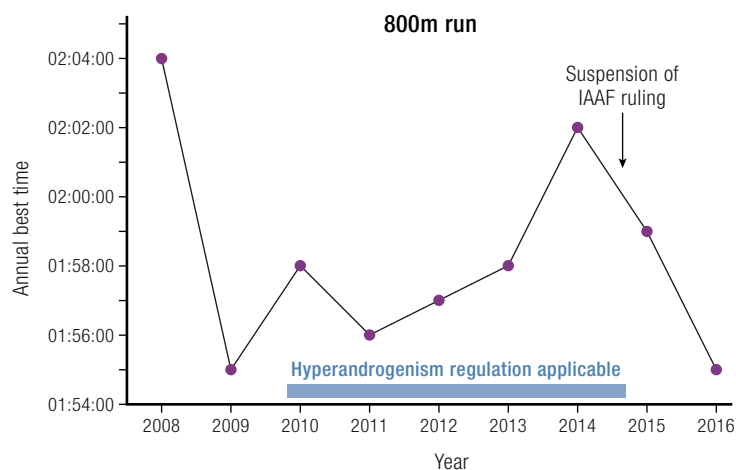
An analogy can be drawn to the World Anti-Doping Agency's practice of accepting salient surrogate evidence for banning the plethora of existing and new drugs with potential but individually unproven ergogenic effects where it is not feasible or ethical to require direct proof of the ergogenic effects. In that

context, the firmly established ergogenic efficacy of androgens (on muscle mass and strength) and increased hemoglobin (on endurance) [evidence reviewed in (1)] mean that chemical substances or methods that increase endogenous testosterone, erythropoietin, or hemoglobin are also considered ergogenic (178). By parity of reasoning, if a condition causes a female athlete's circulating testosterone levels to be in the male range, well exceeding normal female levels, with consequential increases in muscle, hemoglobin, and bone effects (at least), an ergogenic effect may reasonably be assumed.

Conclusions

The available, albeit incomplete, evidence makes it highly likely that the sex difference in circulating testosterone of adults explains most, if not all, the sex differences in sporting performance. This is based on the dose-response effects of circulating testosterone to increase muscle mass and strength, bone size and strength (density), and circulating hemoglobin, each of which alone increases athletic capacity, as well as other possible sex dichotomous, androgen-sensitive contributors such as mental effects (mood, motivation, aggression) and muscle myoglobin content. These facts explain the clear sex difference in athletic performance in most sports, on which basis it is commonly accepted that competition has to be divided into male and female categories.

The first IAAF hyperandrogenism regulation specified a hormonal eligibility criterion of a serum testosterone of <10 nmol/L for an androgen-sensitive athlete's participation in the protected category of female athletic events. This threshold was based on serum testosterone measurements by immunoassays.



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Figure 8. Best annual 800-m times of an elite female athlete between 2008 and 2016. Data provided by Dr. Richard Auchus, University of Michigan, Ann Arbor, Michigan.

Table 5. The Winning Margin in Elite Athletic or Swimming Events During the Last Three Olympics

Median Margin (%) ^a	n	Win Gold	Win Medal	Make Final
Athletics ^b				
Running	81	0.62	0.31	0.22
Jumping	24	0.92	0.42	0.92
Throwing	24	1.93	0.70	0.75
Swimming ^c				
Backstroke	12	0.56	0.28	0.16
Breaststroke	12	0.84	0.14	0.17
Butterfly	12	0.52	0.48	0.12
Freestyle	30	0.49	0.23	0.14
Relay	18	0.37	0.35	0.12

^aWinning margin is defined as the difference (expressed as a percentage of the faster time) between first and second place (Win Gold), between third and fourth place (Win Medal), and between the last into the final and the first that missed out (Make Final). Years (2008, 2012, 2016) and sexes were combined as there were no significant differences in winning margin between them.

^bRunning includes 100 m, 200 m, 400 m, 800 m, 1500 m, 5000 m, 10,000 m, marathon, and 3000-m steeplechase, 110-m (male)/100-m (female) and 400-m hurdles, 4 × 100-m and 4 × 400-m relays, and 20-km and 50-km walk events. Jumping includes high jump, long jump, triple jump, and pole vault events. Throwing includes javelin, shot put, discus, and hammer events. Heptathlon and decathlon were not included as their final results are in points, not times.

^cEvents comprise 100 m and 200 m for the four strokes and 50 m, 100 m, 200 m, 400 m, 800 m (female)/1500 m (male) and marathon 10 km, with the relays being the 4 × 100-m medley and 4 × 100-m and 4 × 200-m freestyle relays.

However, no reliable method-independent consensus threshold could be established using commercial testosterone immunoassays, as these assays differ systematically due to method-specific bias arising unavoidably from the specificity of the different proprietary antibodies employed (25). Based on measurements using the more accurate and specific mass spectrometry methods, if the objective is to require female athletes with congenital conditions that cause them to have serum testosterone concentrations in the normal male range to bring those levels down to the same range as other female athletes, then (allowing for PCOS athletes) the threshold used should not be >5.0 nmol/L. This represents a conservative criterion that includes all healthy young (<40 years) women, including those with PCOS. Conversely, this criterion is generous to intersex/DSD females in allowing them to maintain a higher serum testosterone (2 to 5 nmol/L) than most non-PCOS competitors in female events even though increases in muscle mass and strength and hemoglobin would be expected in this range. This is so even though the range remains below the circulating testosterone levels of middle male puberty when the major biological effects of men's higher circulating testosterone begin to be fully expressed. Ongoing compliance with the eligibility criterion is also an important variable because the estrogen-based suppression of circulating testosterone, typically using daily administered estrogen products, has a rapid onset and offset. Adequate monitoring to prevent gaming of eligibility criteria would require

regular random rather than announced blood sampling.

A related matter is how long such a threshold of circulating testosterone should be maintained prior to competition. In both intersex/DSD and transgender individuals, the developmental effects of adult male circulating testosterone concentrations will have established the sex difference in muscle, hemoglobin, and bone, some of which is fixed and irreversible (bone size) and some of which is maintained by the male circulating testosterone concentrations (muscle, hemoglobin). The limited available prospective evidence from initiation of transgender cross-sex hormone treatment suggests that the advantageous increases in muscle and hemoglobin due to male circulating testosterone concentrations are induced or reversed during the first 12 months and the androgenic effects may plateau after time. This time course is much faster than the somatic effects of male puberty, which evolve over years and for some variables (e.g., peak bone mass) are not complete for up to a decade after the start of puberty. However, the abrupt hormonal changes induced by medical treatment in intersex/DSD or transgender individuals may be telescoped compared with male puberty where circulating testosterone concentrations increase irregularly and incompletely for some years. Additional data are available from the unique investigative model of men undergoing castration for prostate cancer. Just as androgen sensitivity to testosterone may differ between tissues (65), the time course of offset of

androgen effects following withdrawal of male testosterone concentrations may also differ between the major androgen-responsive tissues. For example, circulating hemoglobin shows a progressive fall for 6 months reaching a nadir and plateau at 12 to 16 months in six studies involving 534 men undergoing medical castration for prostate cancer (179–184). Although these studies of older men with prostate cancer must be extrapolated with caution, age, stage of disease, race, and baseline circulating

testosterone concentration did not affect the rate or extent of decline in hemoglobin (179, 181). Comparable longitudinal studies of muscle loss, strength, and performance following castration for prostate cancer are well summarized (185), showing progressive loss for 24 months (see Fig. 4). Further clinical studies to define the time course of changes, mainly offset, in testosterone-dependent effects, notably on muscle and hemoglobin, are badly needed to determine the optimal duration for cross-sex hormone effects in sports.

References

- Handelsman DJ. Performance enhancing hormones in sports doping. In: DeGroot LJ, Jameson JL, eds. *Endocrinology*. 7th ed. Philadelphia, PA: Elsevier Saunders; 2015:441–454.
- Coleman DL. Sex in sport. Available at: [ssrn.com/abstract=2928106](https://www.ssrn.com/abstract=2928106). Accessed 22 October 2017.
- Lee PA, Nordenström A, Houk CP, Ahmed SF, Auchus R, Baratz A, Baratz Dalke K, Liao LM, Lin-Su K, Looijenga LH III, Mazur T, Meyer-Bahlburg HF, Mouriquand P, Quigley CA, Sandberg DE, Vilain E, Witchel S; Global DSD Update Consortium. Global disorders of sex development update since 2006: perceptions, approach and care [published correction appears in *Horm Res Paediatr*. 2016;85(3):180]. *Horm Res Paediatr*. 2016;85(3):158–180.
- Southren AL, Tochimoto S, Carmody NC, Isurugi K. Plasma production rates of testosterone in normal adult men and women and in patients with the syndrome of feminizing testes. *J Clin Endocrinol Metab*. 1965;25(11):1441–1450.
- Horton R, Tait JF. Androstenedione production and interconversion rates measured in peripheral blood and studies on the possible site of its conversion to testosterone. *J Clin Invest*. 1966;45(3):301–313.
- Southren AL, Gordon GG, Tochimoto S. Further study of factors affecting the metabolic clearance rate of testosterone in man. *J Clin Endocrinol Metab*. 1968;28(8):1105–1112.
- Saez JM, Forest MG, Morera AM, Bertrand J. Metabolic clearance rate and blood production rate of testosterone and dihydrotestosterone in normal subjects, during pregnancy, and in hyperthyroidism. *J Clin Invest*. 1972;51(5):1226–1234.
- Handelsman DJ. Sex differences in athletic performance emerge coinciding with the onset of male puberty. *Clin Endocrinol (Oxf)*. 2017;87(1):68–72.
- Auchus RJ. Endocrinology and women's sports: the diagnosis matters. *Law Contemp Probl*. 2017;80:127–138.
- Foddy B, Savulescu J. Time to re-evaluate gender segregation in athletics? *Br J Sports Med*. 2011;45(15):1184–1188.
- Handelsman DJ. Androgen physiology, pharmacology and abuse. In: DeGroot LJ, Jameson JL, eds. *Endocrinology*. 7th ed. Philadelphia, PA: Elsevier Saunders; 2015:2368–2393.
- Miller WL, Auchus RJ. The molecular biology, biochemistry, and physiology of human steroidogenesis and its disorders. *Endocr Rev*. 2011;32(1):81–151.
- Abreu AP, Kaiser UB. Pubertal development and regulation. *Lancet Diabetes Endocrinol*. 2016;4(3):254–264.
- Horton R, Shinsako J, Forsham PH. Testosterone production and metabolic clearance rates with volumes of distribution in normal adult men and women. *Acta Endocrinol (Copenh)*. 1965;48:446–458.
- Rivarola MA, Saez JM, Meyer WJ, Jenkins ME, Migeon CJ. Metabolic clearance rate and blood production rate of testosterone and androst-4-ene-3,17-dione under basal conditions, ACTH and HCG stimulation. Comparison with urinary production rate of testosterone. *J Clin Endocrinol Metab*. 1966;26(11):1208–1218.
- Courant F, Aksglaede L, Antignac JP, Monteau F, Sorensen K, Andersson AM, Skakkebaek NE, Juul A, Bizec BL. Assessment of circulating sex steroid levels in prepubertal and pubertal boys and girls by a novel ultrasensitive gas chromatography-tandem mass spectrometry method. *J Clin Endocrinol Metab*. 2010;95(1):82–92.
- Davison SL, Bell R, Donath S, Montalto JG, Davis SR. Androgen levels in adult females: changes with age, menopause, and oophorectomy. *J Clin Endocrinol Metab*. 2005;90(7):3847–3853.
- Handelsman DJ, Sikaris K, Ly LP. Estimating age-specific trends in circulating testosterone and sex hormone-binding globulin in males and females across the lifespan. *Ann Clin Biochem*. 2016;53(Pt 3):377–384.
- Rothman MS, Carlson NE, Xu M, Wang C, Swerdloff R, Lee P, Goh VH, Ridgway EC, Wierman ME. Reexamination of testosterone, dihydrotestosterone, estradiol and estrone levels across the menstrual cycle and in postmenopausal women measured by liquid chromatography–tandem mass spectrometry. *Steroids*. 2011;76(1-2):177–182.
- Müller RK. History of doping and doping control. *Handb Exp Pharmacol*. 2010;(195):1–23.
- Rosner W, Hankinson SE, Sluss PM, Vesper HW, Wierman ME. Challenges to the measurement of estradiol: an Endocrine Society position statement. *J Clin Endocrinol Metab*. 2013;98(4):1376–1387.
- Rosner W, Auchus RJ, Azziz R, Sluss PM, Raff H. Position statement: utility, limitations, and pitfalls in measuring testosterone: an Endocrine Society position statement. *J Clin Endocrinol Metab*. 2007;92(2):405–413.
- Handelsman DJ, Wartofsky L. Requirement for mass spectrometry sex steroid assays in the *Journal of Clinical Endocrinology and Metabolism*. *J Clin Endocrinol Metab*. 2013;98(10):3971–3973.
- Handelsman DJ. Mass spectrometry, immunoassay and valid steroid measurements in reproductive medicine and science. *Hum Reprod*. 2017;32(6):1147–1150.
- Sikaris K, McLachlan RI, Kazlauskas R, de Kretser D, Holden CA, Handelsman DJ. Reproductive hormone reference intervals for healthy fertile young men: evaluation of automated platform assays. *J Clin Endocrinol Metab*. 2005;90(11):5928–5936.
- Turpeinen U, Linko S, Itkonen O, Hämäläinen E. Determination of testosterone in serum by liquid chromatography–tandem mass spectrometry. *Scand J Clin Lab Invest*. 2008;68(1):50–57.
- Kushnir MM, Blamires T, Rockwood AL, Roberts WL, Yue B, Erdogan E, Bunker AM, Meikle AW. Liquid chromatography–tandem mass spectrometry assay for androstenedione, dehydroepiandrosterone, and testosterone with pediatric and adult reference intervals. *Clin Chem*. 2010;56(7):1138–1147.
- Salameh WA, Redor-Goldman MM, Clarke NJ, Reitz RE, Caulfield MP. Validation of a total testosterone assay using high-turbulence liquid chromatography tandem mass spectrometry: total and free testosterone reference ranges. *Steroids*. 2010;75(2):169–175.
- Neale SM, Hocking R, Biswas M, Turkes A, Rees D, Rees DA, Evans C. Adult testosterone and calculated free testosterone reference ranges by tandem mass spectrometry. *Ann Clin Biochem*. 2013;50(Pt 2):159–161.
- Kelsey TW, Li LQ, Mitchell RT, Whelan A, Anderson RA, Wallace WH. A validated age-related normative model for male total testosterone shows increasing variance but no decline after age 40 years [published correction appears in *PLoS One*. 2015;10(2):e0117674]. *PLoS One*. 2014;9(10):e109346.
- Hart RJ, Doherty DA, McLachlan RI, Walls ML, Keelan JA, Dickinson JE, Skakkebaek NE, Norman RJ, Handelsman DJ. Testicular function in a birth cohort of young men. *Hum Reprod*. 2015;30(12):2713–2724.
- Travison TG, Vesper HW, Orwoll E, Wu F, Kaufman JM, Wang Y, Lapauw B, Fiers T, Matsumoto AM, Bhasin S. Harmonized reference ranges for circulating testosterone levels in men of four cohort studies in the United States and Europe. *J Clin Endocrinol Metab*. 2017;102(4):1161–1173.
- Haring R, Hannemann A, John U, Radke D, Nauck M, Wallaschofski H, Owen L, Adaway J, Keevil BG, Brabant G. Age-specific reference ranges for serum testosterone and androstenedione concentrations in women measured by liquid chromatography–tandem mass spectrometry. *J Clin Endocrinol Metab*. 2012;97(2):408–415.
- Bui HN, Sluss PM, Blincoe S, Knol DL, Blankenstein MA, Heijboer AC. Dynamics of serum testosterone during the menstrual cycle evaluated by daily measurements with an ID-LC-MS/MS method and a 2nd generation automated immunoassay. *Steroids*. 2013;78(1):96–101.

35. Bermon S, Garnier PY. Serum androgen levels and their relation to performance in track and field: mass spectrometry results from 2127 observations in male and female elite athletes. *Br J Sports Med*. 2017;**51**(17):1309–1314.
36. Eklund E, Berglund B, Labrie F, Carlström K, Ekström L, Hirschberg AL. Serum androgen profile and physical performance in women Olympic athletes. *Br J Sports Med*. 2017;**51**(17):1301–1308.
37. Travison TG, Zhuang WV, Lunetta KL, Karasik D, Bhasin S, Kiel DP, Coviello AD, Murabito JM. The heritability of circulating testosterone, oestradiol, oestron and sex hormone binding globulin concentrations in men: the Framingham Heart Study. *Clin Endocrinol (Oxf)*. 2014;**80**(2):277–282.
38. Coviello AD, Zhuang WV, Lunetta KL, Bhasin S, Ulloor J, Zhang A, Karasik D, Kiel DP, Vasani RS, Murabito JM. Circulating testosterone and SHBG concentrations are heritable in women: the Framingham Heart Study. *J Clin Endocrinol Metab*. 2011;**96**(9):E1491–E1495.
39. Fui MN, Dupuis P, Grossmann M. Lowered testosterone in male obesity: mechanisms, morbidity and management. *Asian J Androl*. 2014;**16**(2):223–231.
40. Corona G, Rastrelli G, Monami M, Saad F, Luconi M, Luchese M, Facchiano E, Sforza A, Forti G, Mannucci E, Maggi M. Body weight loss reverts obesity-associated hypogonadotropic hypogonadism: a systematic review and meta-analysis. *Eur J Endocrinol*. 2013;**168**(6):829–843.
41. Sartorius G, Spasevska S, Idan A, Turner L, Forbes E, Zamojska A, Allan CA, Ly LP, Conway AJ, McLachlan RI, Handelsman DJ. Serum testosterone, dihydrotestosterone and estradiol concentrations in older men self-reporting very good health: the healthy man study. *Clin Endocrinol (Oxf)*. 2012;**77**(5):755–763.
42. Webb ML, Wallace JP, Hamill C, Hodgson JL, Mashaly MM. Serum testosterone concentration during two hours of moderate intensity treadmill running in trained men and women. *Endocr Res*. 1984;**10**(1):27–38.
43. Cano Sokoloff N, Misra M, Ackerman KE. Exercise, training, and the hypothalamic-pituitary-gonadal axis in men and women. *Front Horm Res*. 2016;**47**:27–43.
44. Bozdag G, Mumusoglu S, Zengin D, Karabulut E, Yildiz BO. The prevalence and phenotypic features of polycystic ovary syndrome: a systematic review and meta-analysis. *Hum Reprod*. 2016;**31**(12):2841–2855.
45. Hagmar M, Berglund B, Brismar K, Hirschberg AL. Hyperandrogenism may explain reproductive dysfunction in Olympic athletes. *Med Sci Sports Exerc*. 2009;**41**(6):1241–1248.
46. Eliakim A, Marom N, Galitskaya L, Nemet D. Hyperandrogenism among elite adolescent female athletes. *J Pediatr Endocrinol Metab*. 2010;**23**(8):755–758.
47. Rickenlund A, Carlström K, Ekblom B, Brismar TB, von Schoultz B, Hirschberg AL. Hyperandrogenicity is an alternative mechanism underlying oligomenorrhea or amenorrhea in female athletes and may improve physical performance. *Fertil Steril*. 2003;**79**(4):947–955.
48. Falhammar H, Nordenström A. Nonclassic congenital adrenal hyperplasia due to 21-hydroxylase deficiency: clinical presentation, diagnosis, treatment, and outcome. *Endocrine*. 2015;**50**(1):32–50.
49. Auchus RJ. The classic and nonclassic congenital adrenal hyperplasias. *Endocr Pract*. 2015;**21**(4):383–389.
50. Moran LJ, Munda PA, Teede HJ, Meikle PJ. The association of the lipidomic profile with features of polycystic ovary syndrome. *J Mol Endocrinol*. 2017;**59**(1):93–104.
51. Münzker J, Lindheim L, Adaway J, Trummer C, Lerchbaum E, Pieber TR, Keevil B, Obermayer-Pietsch B. High salivary testosterone-to-androstenedione ratio and adverse metabolic phenotypes in women with polycystic ovary syndrome. *Clin Endocrinol (Oxf)*. 2017;**86**(4):567–575.
52. O'Reilly MW, Kempegowda P, Jenkinson C, Taylor AE, Quanson JL, Storbeck KH, Arlt W. 11-Oxygenated C19 steroids are the predominant androgens in polycystic ovary syndrome. *J Clin Endocrinol Metab*. 2017;**102**(3):840–848.
53. Handelsman DJ, Teede HJ, Desai R, Norman RJ, Moran LJ. Performance of mass spectrometry steroid profiling for diagnosis of polycystic ovary syndrome. *Hum Reprod*. 2017;**32**(2):418–422.
54. Pasquali R, Zanotti L, Fanelli F, Mezzullo M, Fazzini A, Morselli Labate AM, Repaci A, Ribichini D, Gambineri A. Defining hyperandrogenism in women with polycystic ovary syndrome: a challenging perspective. *J Clin Endocrinol Metab*. 2016;**101**(5):2013–2022.
55. Yang Y, Han Y, Wang W, Du T, Li Y, Zhang J, Yang D, Zhao X. Assessing new terminal body and facial hair growth during pregnancy: toward developing a simplified visual scoring system for hirsutism. *Fertil Steril*. 2016;**105**(2):494–500.
56. Tosi F, Fiers T, Kaufman JM, Dall'Alda M, Moretta R, Giagulli VA, Bonora E, Moghetti P. Implications of androgen assay accuracy in the phenotyping of women with polycystic ovary syndrome. *J Clin Endocrinol Metab*. 2016;**101**(2):610–618.
57. Daan NM, Jaspers L, Koster MP, Broekmans FJ, de Rijke YB, Franco OH, Laven JS, Kavousi M, Fauser BC. Androgen levels in women with various forms of ovarian dysfunction: associations with cardiometabolic features. *Hum Reprod*. 2015;**30**(10):2376–2386.
58. Bui HN, Sluss PM, Hayes FJ, Blincko S, Knol DL, Blankenstein MA, Heijboer AC. Testosterone, free testosterone, and free androgen index in women: reference intervals, biological variation, and diagnostic value in polycystic ovary syndrome. *Clin Chim Acta*. 2015;**450**:227–232.
59. Keefe CC, Goldman MM, Zhang K, Clarke N, Reitz RE, Welt CK. Simultaneous measurement of thirteen steroid hormones in women with polycystic ovary syndrome and control women using liquid chromatography-tandem mass spectrometry. *PLoS One*. 2014;**9**(4):e93805.
60. Yasmin E, Balen AH, Barth JH. The association of body mass index and biochemical hyperandrogenaemia in women with and without polycystic ovary syndrome. *Eur J Obstet Gynecol Reprod Biol*. 2013;**166**(2):173–177.
61. Jansse F, Eijkemans MJ, Goverde AJ, Lentjes EG, Hoek A, Lambalk CB, Hickey TE, Fauser BC, Norman RJ. Assessment of androgen concentration in women: liquid chromatography-tandem mass spectrometry and extraction RIA show comparable results. *Eur J Endocrinol*. 2011;**165**(6):925–933.
62. Jedel E, Gustafson D, Waern M, Sverrisdottir YB, Landén M, Janson PO, Labrie F, Ohlsson C, Stener-Victorin E. Sex steroids, insulin sensitivity and sympathetic nerve activity in relation to affective symptoms in women with polycystic ovary syndrome. *Psychoneuroendocrinology*. 2011;**36**(10):1470–1479.
63. Legro RS, Schlaff WD, Diamond MP, Coutifaris C, Casson PR, Brzyski RG, Christman GM, Trussell JC, Krawetz SA, Snyder PJ, Ohl D, Carson SA, Steinkampf MP, Carr BR, McGovern PG, Cataldo NA, Gosman CG, Nestler JE, Myers ER, Santoro N, Eisenberg E, Zhang M, Zhang H; Reproductive Medicine Network. Total testosterone assays in women with polycystic ovary syndrome: precision and correlation with hirsutism. *J Clin Endocrinol Metab*. 2010;**95**(12):5305–5313.
64. Stener-Victorin E, Holm G, Labrie F, Nilsson L, Janson PO, Ohlsson C. Are there any sensitive and specific sex steroid markers for polycystic ovary syndrome? *J Clin Endocrinol Metab*. 2010;**95**(2):810–819.
65. Finkelstein JS, Lee H, Burnett-Bowie SA, Pallais JC, Yu EW, Borges LF, Jones BF, Barry CV, Wulczyn KE, Thomas BJ, Leder BZ. Gonadal steroids and body composition, strength, and sexual function in men. *N Engl J Med*. 2013;**369**(11):1011–1022.
66. Donovan KA, Gonzalez BD, Nelson AM, Fishman MN, Zachariah B, Jacobsen PB. Effect of androgen deprivation therapy on sexual function and bother in men with prostate cancer: a controlled comparison. *Psychooncology*. 2018;**27**(1):316–324.
67. Buena F, Swerdloff RS, Steiner BS, Lutchmansingh P, Peterson MA, Pandian MR, Galmarini M, Bhasin S. Sexual function does not change when serum testosterone levels are pharmacologically varied within the normal male range. *Fertil Steril*. 1993;**59**(5):1118–1123.
68. Sartorius GA, Ly LP, Handelsman DJ. Male sexual function can be maintained without aromatization: randomized placebo-controlled trial of dihydrotestosterone (DHT) in healthy, older men for 24 months. *J Sex Med*. 2014;**11**(10):2562–2570.
69. Liu PY, Swerdloff RS, Christenson PD, Handelsman DJ, Wang C; Hormonal Male Contraception Summit Group. Rate, extent, and modifiers of spermatogenic recovery after hormonal male contraception: an integrated analysis. *Lancet*. 2006;**367**(9520):1412–1420.
70. Walsh PC, Swerdloff RS. Biphasic effect of testosterone on spermatogenesis in the rat. *Invest Urol*. 1973;**11**(3):190–193.
71. Singh J, O'Neill C, Handelsman DJ. Induction of spermatogenesis by androgens in gonadotropin-deficient (*hpg*) mice. *Endocrinology*. 1995;**136**(12):5311–5321.
72. Handelsman DJ, Spaliviero JA, Simpson JM, Allan CM, Singh J. Spermatogenesis without gonadotropins: maintenance has a lower testosterone threshold than initiation. *Endocrinology*. 1999;**140**(9):3938–3946.
73. Juel Mortensen L, Blomberg Jensen M, Christiansen P, Ronholt AM, Jørgensen A, Frederiksen H, Nielsen JE, Loya AC, Grønkræft Toft B, Skakkebaek NE, Rajpert-De Meyts E, Juul A. Germ cell neoplasia in situ and preserved fertility despite suppressed gonadotropins in a patient with testotoxicosis. *J Clin Endocrinol Metab*. 2017;**102**(12):4411–4416.
74. Cunha-Silva M, Brito VN, Macedo DB, Bessa DS, Ramos CO, Lima LG, Barroso PS, Arnhold IJP, Segaloff DL, Mendonca BB, Latronico AC. Spontaneous fertility in a male patient with testotoxicosis despite suppression of FSH levels. *Hum Reprod*. 2018;**33**(5):914–918.
75. Mendonca BB, Batista RL, Domenice S, Costa EM, Arnhold IJ, Russell DW, Wilson JD. Steroid 5 α -reductase 2 deficiency. *J Steroid Biochem Mol Biol*. 2016;**163**:206–211.
76. Mendonca BB, Gomes NL, Costa EM, Inacio M, Martin RM, Nishi MY, Carvalho FM, Tibor FD, Domenice S. 46,XY disorder of sex development (DSD) due to 17 β -hydroxysteroid dehydrogenase type 3 deficiency. *J Steroid Biochem Mol Biol*. 2017;**165**(Pt A):79–85.

77. Quigley CA, De Bellis A, Marschke KB, el-Awady MK, Wilson EM, French FS. Androgen receptor defects: historical, clinical, and molecular perspectives. *Endocr Rev.* 1995;**16**(3):271–321.
78. Lucas-Herald A, Bertelloni S, Juul A, Bryce J, Jiang J, Rodie M, Sinnott R, Borojerdi M, Lindhardt Johansen M, Hiort O, Holterhus PM, Cools M, Guaragna-Filho G, Guerra-Junior G, Weintrob N, Hannema S, Drop S, Guran T, Darendeliler F, Nordenstrom A, Hughes IA, Acerini C, Tadokoro-Cuccaro R, Ahmed SF. The long-term outcome of boys with partial androgen insensitivity syndrome and a mutation in the androgen receptor gene. *J Clin Endocrinol Metab.* 2016;**101**(11):3959–3967.
79. El-Maouche D, Arlt W, Merke DP. Congenital adrenal hyperplasia. *Lancet.* 2017;**390**(10108):2194–2210.
80. Bermon S, Garnier PY, Hirschberg AL, Robinson N, Giraud S, Nicoli R, Baume N, Saugy M, Fénelich P, Bruce SJ, Henry H, Dollé G, Ritzen M. Serum androgen levels in elite female athletes. *J Clin Endocrinol Metab.* 2014;**99**(11):4328–4335.
81. Imperato-McGinley J, Peterson RE, Gautier T, Sturla E. Androgens and the evolution of male-gender identity among male pseudohermaphrodites with 5 α -reductase deficiency. *N Engl J Med.* 1979;**300**(22):1233–1237.
82. Kang HJ, Imperato-McGinley J, Zhu YS, Rosenwaks Z. The effect of 5 α -reductase-2 deficiency on human fertility. *Fertil Steril.* 2014;**101**(2):310–316.
83. Strickland AL, French FS. Absence of response to dihydrotestosterone in the syndrome of testicular feminization. *J Clin Endocrinol Metab.* 1969;**29**(9):1284–1286.
84. Rosenfield RL, Lawrence AM, Liao S, Landau RL. Androgens and androgen responsiveness in the feminizing testis syndrome. Comparison of complete and “incomplete” forms. *J Clin Endocrinol Metab.* 1971;**32**(5):625–632.
85. Hamilton CR Jr, Kliman B. Anabolic effect of dihydrotestosterone in testicular feminization syndrome. *Metabolism.* 1971;**20**(9):870–877.
86. Zachmann M, Zagalak M, Völlmin JA, Gitzelmann RP, Prader A. Influence of testosterone on urinary ¹⁵N-balance in normal subjects and patients with testicular feminization. *Clin Chim Acta.* 1977;**77**(2):147–157.
87. Tincello DG, Saunders PT, Hodgins MB, Simpson NB, Edwards CR, Hargreaves TB, Wu FC. Correlation of clinical, endocrine and molecular abnormalities with in vivo responses to high-dose testosterone in patients with partial androgen insensitivity syndrome. *Clin Endocrinol (Oxf).* 1997;**46**(4):497–506.
88. Grino PB, Isidro-Gutierrez RF, Griffin JE, Wilson JD. Androgen resistance associated with a qualitative abnormality of the androgen receptor and responsive to high dose androgen therapy. *J Clin Endocrinol Metab.* 1989;**68**(3):578–584.
89. Lundberg Giwercman Y, Nikoshkov A, Lindsten K, Byström B, Poussette A, Knudtzon J, Alm J, Wedell A. Response to treatment in patients with partial androgen insensitivity due to mutations in the DNA-binding domain of the androgen receptor. *Horm Res.* 2000;**53**(2):83–88.
90. Holterhus PM, Sinnecker GH, Hiort O. Phenotypic diversity and testosterone-induced normalization of mutant L712F androgen receptor function in a kindred with androgen insensitivity. *J Clin Endocrinol Metab.* 2000;**85**(9):3245–3250.
91. Quigley CA. *The androgen receptor: physiology and pathophysiology.* In: Nieschlag E, Behre HM, eds. *Testosterone: Action, Deficiency, Substitution.* 2nd ed. Berlin, Germany: Springer-Verlag; 1998:33–106.
92. Karunasena N, Han TS, Mallappa A, Elman M, Merke DP, Ross RJ, Daniel E. Androgens correlate with increased erythropoiesis in women with congenital adrenal hyperplasia. *Clin Endocrinol (Oxf).* 2017;**86**(1):19–25.
93. Herbst KL, Bhasin S. Testosterone action on skeletal muscle. *Curr Opin Clin Nutr Metab Care.* 2004;**7**(3):271–277.
94. Dubois V, Laurent MR, Sinnesael M, Cielen N, Helsen C, Clincemalie L, Spans L, Gayan-Ramirez G, Deldicque L, Hespel P, Carmeliet G, Vanderschueren D, Claessens F. A satellite cell-specific knockout of the androgen receptor reveals myostatin as a direct androgen target in skeletal muscle. *FASEB J.* 2014;**28**(7):2979–2994.
95. Usui T, Kajita K, Kajita T, Mori I, Hanamoto T, Ikeda T, Okada H, Taguchi K, Kitada Y, Morita H, Sasaki T, Kitamura T, Sato T, Kojima I, Ishizuka T. Elevated mitochondrial biogenesis in skeletal muscle is associated with testosterone-induced body weight loss in male mice. *FEBS Lett.* 2014;**588**(10):1935–1941.
96. Mänttari S, Anttila K, Järvillehto M. Testosterone stimulates myoglobin expression in different muscles of the mouse. *J Comp Physiol B.* 2008;**178**(7):899–907.
97. Ferrando AA, Sheffield-Moore M, Yeckel CW, Gilkison C, Jiang J, Achacosa A, Lieberman SA, Tipton K, Wolfe RR, Urban RJ. Testosterone administration to older men improves muscle function: molecular and physiological mechanisms. *Am J Physiol Endocrinol Metab.* 2002;**282**(3):E601–E607.
98. Matzuk MM, Lamb DJ. The biology of infertility: research advances and clinical challenges. *Nat Med.* 2008;**14**(11):1197–1213.
99. Matzuk MM, Lamb DJ. Genetic dissection of mammalian fertility pathways. *Nat Cell Biol.* 2002;**4**(Suppl):S41–S49.
100. Walters KA, Simanainen U, Handelsman DJ. Molecular insights into androgen actions in male and female reproductive function from androgen receptor knockout models. *Hum Reprod Update.* 2010;**16**(5):543–558.
101. MacLean HE, Chiu WS, Notrini AJ, Axell AM, Davey RA, McManus JF, Ma C, Plant DR, Lynch GS, Zajac JD. Impaired skeletal muscle development and function in male, but not female, genomic androgen receptor knockout mice. *FASEB J.* 2008;**22**(8):2676–2689.
102. Morrow JR Jr, Hosler WW. Strength comparisons in untrained men and trained women athletes. *Med Sci Sports Exerc.* 1981;**13**(3):194–197.
103. Miller AE, MacDougall JD, Tarnopolsky MA, Sale DG. Gender differences in strength and muscle fiber characteristics. *Eur J Appl Physiol Occup Physiol.* 1993;**66**(3):254–262.
104. Janssen I, Heymsfield SB, Wang ZM, Ross R. Skeletal muscle mass and distribution in 468 men and women aged 18–88 yr. *J Appl Physiol.* 2000;**89**(1):81–88.
105. Hosler WW, Morrow JR Jr. Arm and leg strength compared between young women and men after allowing for differences in body size and composition. *Ergonomics.* 1982;**25**(4):309–313.
106. Sale DG. Neuromuscular function. In: Tarnopolsky M, ed. *Gender Differences in Metabolism: Practical and Nutritional Implications.* Boca Raton, FL: CRC Press; 1999:61–86.
107. Tønnessen E, Svendsen IS, Olsen IC, Guttormsen A, Haugen T. Performance development in adolescent track and field athletes according to age, sex and sport discipline. *PLoS One.* 2015;**10**(6):e0129014.
108. Carmina E, Guastella E, Longo RA, Rini GB, Lobo RA. Correlates of increased lean muscle mass in women with polycystic ovary syndrome. *Eur J Endocrinol.* 2009;**161**(4):583–589.
109. Douchi T, Oki T, Yamasaki H, Kuwahata R, Nakae M, Nagata Y. Relationship of androgens to muscle size and bone mineral density in women with polycystic ovary syndrome. *Obstet Gynecol.* 2001;**98**(3):445–449.
110. Cardinale M, Stone MH. Is testosterone influencing explosive performance? *J Strength Cond Res.* 2006;**20**(1):103–107.
111. Bhasin S, Woodhouse L, Casaburi R, Singh AB, Bhasin D, Berman N, Chen X, Yarasheski KE, Magliano L, Dzekov C, Dzekov J, Bross R, Phillips J, Sinha-Hikim I, Shen R, Storer TW. Testosterone dose-response relationships in healthy young men. *Am J Physiol Endocrinol Metab.* 2001;**281**(6):E1172–E1181.
112. Huang G, Basaria S, Travison TG, Ho MH, Davda M, Mazer NA, Miciek R, Knapp PE, Zhang A, Collins L, Ursino M, Appleman E, Dzekov C, Stroh H, Ouellette M, Rundell T, Baby M, Bhatia NN, Khorram O, Friedman T, Storer TW, Bhasin S. Testosterone dose-response relationships in hysterectomized women with or without oophorectomy: effects on sexual function, body composition, muscle performance and physical function in a randomized trial. *Menopause.* 2014;**21**(6):612–623.
113. Dobs AS, Nguyen T, Pace C, Roberts CP. Differential effects of oral estrogen versus oral estrogen-androgen replacement therapy on body composition in postmenopausal women. *J Clin Endocrinol Metab.* 2002;**87**(4):1509–1516.
114. Elbers JM, Asscheman H, Seidell JC, Gooren LJ. Effects of sex steroid hormones on regional fat depots as assessed by magnetic resonance imaging in transsexuals. *Am J Physiol.* 1999;**276**(2 Pt 1):E317–E325.
115. Van Caenegem E, Wierckx K, Taes Y, Schreiner T, Vandewalle S, Toye K, Lapauw B, Kaufman JM, T'Sjoen G. Body composition, bone turnover, and bone mass in trans men during testosterone treatment: 1-year follow-up data from a prospective case-controlled study (ENIGI). *Eur J Endocrinol.* 2015;**172**(2):163–171.
116. Sonksen P. Determination and regulation of body composition in elite athletes. *Br J Sports Med.* 2018;**52**(4):219–229.
117. Storer TW, Woodhouse L, Magliano L, Singh AB, Dzekov C, Dzekov J, Bhasin S. Changes in muscle mass, muscle strength, and power but not physical function are related to testosterone dose in healthy older men. *J Am Geriatr Soc.* 2008;**56**(11):1991–1999.
118. Bhasin S, Parker RA, Sattler F, Haubrich R, Alston B, Umbleja T, Shikuma CM; AIDS Clinical Trials Group Protocol A5079 Study Team. Effects of testosterone supplementation on whole body and regional fat mass and distribution in human immunodeficiency virus-infected men with abdominal obesity. *J Clin Endocrinol Metab.* 2007;**92**(3):1049–1057.
119. Bhasin S, Woodhouse L, Casaburi R, Singh AB, Mac RP, Lee M, Yarasheski KE, Sinha-Hikim I, Dzekov C, Dzekov J, Magliano L, Storer TW. Older men are as responsive as young men to the anabolic effects of graded doses of testosterone on the skeletal muscle. *J Clin Endocrinol Metab.* 2005;**90**(2):678–688.
120. Franke WW, Berendonk B. Hormonal doping and androgenization of athletes: a secret program of the German Democratic Republic government. *Clin Chem.* 1997;**43**(7):1262–1279.
121. Shahani S, Braga-Basaria M, Maggio M, Basaria S. Androgens and erythropoiesis: past and present. *J Endocrinol Invest.* 2009;**32**(8):704–716.
122. Bachman E, Travison TG, Basaria S, Davda MN, Guo W, Li M, Connor Westfall J, Bae H, Gondeuk V,

- Bhasin S. Testosterone induces erythrocytosis via increased erythropoietin and suppressed hepcidin: evidence for a new erythropoietin/hemoglobin set point. *J Gerontol A Biol Sci Med Sci*. 2014;**69**(6):725–735.
123. Ordway GA, Garry DJ. Myoglobin: an essential hemoprotein in striated muscle. *J Exp Biol*. 2004;**207**(Pt 20):3441–3446.
124. Ekblom B, Goldbarb AN, Gullbring B. Response to exercise after blood loss and reinfusion. *J Appl Physiol*. 1972;**33**(2):175–180.
125. Murphy WG. The sex difference in haemoglobin levels in adults—mechanisms, causes, and consequences. *Blood Rev*. 2014;**28**(2):41–47.
126. Grossmann M, Zajac JD. Hematological changes during androgen deprivation therapy. *Asian J Androl*. 2012;**14**(2):187–192.
127. Snyder PJ, Peachey H, Berlin JA, Hannoush P, Haddad G, Dlewati A, Santanna J, Loh L, Lenrow DA, Holmes JH, Kapoor SC, Atkinson LE, Strom BL. Effects of testosterone replacement in hypogonadal men. *J Clin Endocrinol Metab*. 2000;**85**(8):2670–2677.
128. Roy CN, Snyder PJ, Stephens-Shields AJ, Artz AS, Bhasin S, Cohen HJ, Farrar JT, Gill TM, Zeldow B, Cella D, Barrett-Connor E, Cauley JA, Crandall JP, Cunningham GR, Ensrud KE, Lewis CE, Matsumoto AM, Molitch ME, Pahor M, Swerdloff RS, Cifelli D, Hou X, Resnick SM, Walston JD, Anton S, Basaria S, Diem SJ, Wang C, Schrier SL, Ellenberg SS. Association of testosterone levels with anemia in older men: a controlled clinical trial. *JAMA Intern Med*. 2017;**177**(4):480–490.
129. Berria R, Gastaldelli A, Lucidi S, Belfort R, De Filippis E, Easton C, Brytzki R, Cusi K, Jovanovic L, DeFronzo R. Reduction in hematocrit level after pioglitazone treatment is correlated with decreased plasma free testosterone level, not hemodilution, in women with polycystic ovary syndrome. *Clin Pharmacol Ther*. 2006;**80**(2):105–114.
130. Han Y, Kim HS, Lee HJ, Oh JY, Sung YA. Metabolic effects of polycystic ovary syndrome in adolescents. *Ann Pediatr Endocrinol Metab*. 2015;**20**(3):136–142.
131. Coviello AD, Kaplan B, Lakshman KM, Chen T, Singh AB, Bhasin S. Effects of graded doses of testosterone on erythropoiesis in healthy young and older men. *J Clin Endocrinol Metab*. 2008;**93**(3):914–919.
132. Irwig MS. Testosterone therapy for transgender men. *Lancet Diabetes Endocrinol*. 2017;**5**(4):301–311.
133. Velho I, Figuera TM, Ziegelmann PK, Spritzer PM. Effects of testosterone therapy on BMI, blood pressure, and laboratory profile of transgender men: a systematic review. *Andrology*. 2017;**5**(5):881–888.
134. Jacobeit JW, Gooren LJ, Schulte HM. Safety aspects of 36 months of administration of long-acting intramuscular testosterone undecanoate for treatment of female-to-male transgender individuals. *Eur J Endocrinol*. 2009;**161**(5):795–798.
135. Almeida M, Laurent MR, Dubois V, Claessens F, O'Brien CA, Bouillon R, Vanderschueren D, Manolagas SC. Estrogens and androgens in skeletal physiology and pathophysiology. *Physiol Rev*. 2017;**97**(1):135–187.
136. Sharma K, Gupta P, Shandilya S. Age related changes in pelvis size among adolescent and adult females with reference to parturition from Naraingarh, Haryana (India). *Homo*. 2016;**67**(4):273–293.
137. Fischer B, Mitteroecker P. Allometry and sexual dimorphism in the human pelvis. *Anat Rec (Hoboken)*. 2017;**300**(4):698–705.
138. Riesenfeld A. Functional and hormonal control of pelvic width in the rat. *Acta Anat (Basel)*. 1978;**102**(4):427–432.
139. Berdnikovs S, Bernstein M, Metzler A, German RZ. Pelvic growth: ontogeny of size and shape sexual dimorphism in rat pelvis. *J Morphol*. 2007;**268**(1):12–22.
140. Polderman TJ, Benyamin B, de Leeuw CA, Sullivan PF, van Bochoven A, Visscher PM, Posthuma D. Meta-analysis of the heritability of human traits based on fifty years of twin studies. *Nat Genet*. 2015;**47**(7):702–709.
141. Jelenkovic A, Sund R, Hur YM, Yokoyama Y, Hjelmborg JV, Möller S, Honda C, Magnusson PK, Pedersen NL, Ooki S, Aaltonen S, Stazi MA, Fagnani C, D'Ippolito C, Freitas DL, Maia JA, Ji F, Ning F, Pang Z, Rebato E, Busjahn A, Kandler C, Saudino KJ, Jang KL, Cozen W, Hwang AE, Mack TM, Gao W, Yu C, Li L, Corley RP, Huibregtse BM, Derom CA, Vlietinck RF, Loos RJ, Heikkilä K, Wardle J, Llewellyn CH, Fisher A, McAdams TA, Eley TC, Gregory AM, He M, Ding X, Bjerregaard-Andersen M, Beck-Nielsen H, Sodemann M, Tarnoki AD, Tarnoki DL, Knafo-Noam A, Mankuta D, Abramson L, Burt SA, Klump KL, Silberg JL, Eaves LJ, Maes HH, Krueger RF, McGue M, Pahlen S, Gatz M, Butler DA, Bartels M, van Beijsterveldt TC, Craig JM, Saffery R, Dubois L, Boivin M, Brendgen M, Dionne G, Vitaro F, Martin NG, Medland SE, Montgomery GW, Swan GE, Krasnow R, Tynelius P, Lichtenstein P, Haworth CM, Plomin R, Bayasgalan G, Narandalai D, Harden KP, Tucker-Drob EM, Spector T, Mangino M, Lachance G, Baker LA, Tuvblad C, Duncan GE, Buchwald D, Willemsen G, Skytthe A, Kyvik KO, Christensen K, Öncel SY, Aliev F, Rasmussen F, Goldberg JH, Sørensen TI, Boomsma DI, Kaprio J, Silventoinen K. Genetic and environmental influences on height from infancy to early adulthood: an individual-based pooled analysis of 45 twin cohorts. *Sci Rep*. 2016;**6**(1):28496.
142. Jelenkovic A, Hur YM, Sund R, Yokoyama Y, Siribaddana SH, Hotopf M, Sumathipala A, Rijdsdijk F, Tan Q, Zhang D, Pang Z, Aaltonen S, Heikkilä K, Öncel SY, Aliev F, Rebato E, Tarnoki AD, Tarnoki DL, Christensen K, Skytthe A, Kyvik KO, Silberg JL, Eaves LJ, Maes HH, Cutler TL, Hopper JL, Ordoñana JR, Sánchez-Romera JF, Colodro-Conde L, Cozen W, Hwang AE, Mack TM, Sung J, Song YM, Yang S, Lee K, Franz CE, Kremen WS, Lyons MJ, Busjahn A, Nelson TL, Whitfield KE, Kandler C, Jang KL, Gatz M, Butler DA, Stazi MA, Fagnani C, D'Ippolito C, Duncan GE, Buchwald D, Derom CA, Vlietinck RF, Loos RJ, Martin NG, Medland SE, Montgomery GW, Jeong HU, Swan GE, Krasnow R, Magnusson PK, Pedersen NL, Dahl-Aslan AK, McAdams TA, Eley TC, Gregory AM, Tynelius P, Baker LA, Tuvblad C, Bayasgalan G, Narandalai D, Lichtenstein P, Spector TD, Mangino M, Lachance G, Bartels M, van Beijsterveldt TC, Willemsen G, Burt SA, Klump KL, Harris JR, Brandt I, Nilsen TS, Krueger RF, McGue M, Pahlen S, Corley RP, Hjelmborg JV, Goldberg JH, Iwatai Y, Watanabe M, Honda C, Inui F, Rasmussen F, Huibregtse BM, Boomsma DI, Sørensen TI, Kaprio J, Silventoinen K. Genetic and environmental influences on adult human height across birth cohorts from 1886 to 1994. *eLife*. 2016;**5**:e20320.
143. Bechtold S, Beyerlein A, Bonfig W, Dalla Pozza R, Putzker S, Otto R, Schmidt H, Schwarz HP. Sexual difference in bone geometry of adult patients with classical congenital adrenal hyperplasia: data using peripheral quantitative computed tomography. *Horm Res Paediatr*. 2014;**82**(3):171–178.
144. Falhammar H, Filipsson H, Holmdahl G, Janson PO, Nordenskjöld A, Hagenfeldt K, Thorén M. Fractures and bone mineral density in adult women with 21-hydroxylase deficiency. *J Clin Endocrinol Metab*. 2007;**92**(12):4643–4649.
145. Bhasin S, Storer TW, Berman N, Callegari C, Clevenger B, Phillips J, Bunnell TJ, Tricker R, Shirazi A, Casaburi R. The effects of supraphysiologic doses of testosterone on muscle size and strength in normal men. *N Engl J Med*. 1996;**335**(1):1–7.
146. Moreira CA, Bilezikian JP. Stress fractures: concepts and therapeutics. *J Clin Endocrinol Metab*. 2017;**102**(2):525–534.
147. Foryst-Ludwig A, Kintscher U. Sex differences in exercise-induced cardiac hypertrophy. *Pflugers Arch*. 2013;**465**(5):731–737.
148. Gibala MJ, Gillen JB, Percival ME. Physiological and health-related adaptations to low-volume interval training: influences of nutrition and sex. *Sports Med*. 2014;**44**(Suppl 2):S127–S137.
149. Townsend EA, Miller VM, Prakash YS. Sex differences and sex steroids in lung health and disease. *Endocr Rev*. 2012;**33**(1):1–47.
150. Levine SC, Foley A, Lourenco S, Ehrlich S, Ratliff K. Sex differences in spatial cognition: advancing the conversation. *Wiley Interdiscip Rev Cogn Sci*. 2016;**7**(2):127–155.
151. Hines M. Prenatal testosterone and gender-related behaviour. *Eur J Endocrinol*. 2006;**155**(Suppl 1):S115–S121.
152. Hines M, Spencer D, Kung KT, Browne WV, Constantinescu M, Noorderhaven RM. The early postnatal period, mini-puberty, provides a window on the role of testosterone in human neuro-behavioural development. *Curr Opin Neurobiol*. 2016;**38**:69–73.
153. Pope HG Jr, Kouri EM, Hudson JL. Effects of supraphysiologic doses of testosterone on mood and aggression in normal men: a randomized controlled trial. *Arch Gen Psychiatry*. 2000;**57**(2):133–140.
154. Ferguson-Smith MA, Bavington LD. Natural selection for genetic variants in sport: the role of Y chromosome genes in elite female athletes with 46, XY DSD. *Sports Med*. 2014;**44**(12):1629–1634.
155. Heymsfield SB, Gonzalez MC, Lu J, Jia G, Zheng J. Skeletal muscle mass and quality: evolution of modern measurement concepts in the context of sarcopenia. *Proc Nutr Soc*. 2015;**74**(4):355–366.
156. Silventoinen K, Sarmalisto S, Perola M, Boomsma DI, Cornes BK, Davis C, Dunkel L, De Lange M, Harris JR, Hjelmborg JV, Luciano M, Martin NG, Mortensen J, Nistico L, Pedersen NL, Skytthe A, Spector TD, Stazi MA, Willemsen G, Kaprio J. Heritability of adult body height: a comparative study of twin cohorts in eight countries. *Twin Res*. 2003;**6**(5):399–408.
157. Beunen G, Thomis M. Gene powered? Where to go from heritability (h²) in muscle strength and power? *Exerc Sport Sci Rev*. 2004;**32**(4):148–154.
158. Silventoinen K, Magnusson PK, Tynelius P, Kaprio J, Rasmussen F. Heritability of body size and muscle strength in young adulthood: a study of one million Swedish men. *Genet Epidemiol*. 2008;**32**(4):341–349.
159. Seeman E. Pathogenesis of bone fragility in women and men. *Lancet*. 2002;**359**(9320):1841–1850.
160. Nishiyama KK, Macdonald HM, Moore SA, Fung T, Boyd SK, McKay HA. Cortical porosity is higher in boys compared with girls at the distal radius and distal tibia during pubertal growth: an HR-pQCT study. *J Bone Miner Res*. 2012;**27**(2):273–282.
161. Oliveira CS, Alves C. The role of the SHOX gene in the pathophysiology of Turner syndrome. *Endocrinol Nutr*. 2011;**58**(8):433–442.
162. Ottesen AM, Aksglaede L, Garn I, Tartaglia N, Tassone F, Gravholt CH, Bojesen A, Sørensen K, Jørgensen N, Rajpert-De Meyts E, Gerdes T, Lind AM, Kjaergaard S, Juul A. Increased number of sex

- chromosomes affects height in a nonlinear fashion: a study of 305 patients with sex chromosome aneuploidy. *Am J Med Genet A*. 2010;**152A**(5):1206–1212.
163. Wideman L, Weltman JY, Shah N, Story S, Veldhuis JD, Weltman A. Effects of gender on exercise-induced growth hormone release. *J Appl Physiol*. 1999;**87**(3):1154–1162.
164. Veldhuis JD, Roemmich JN, Rogol AD. Gender and sexual maturation-dependent contrasts in the neuroregulation of growth hormone secretion in prepubertal and late adolescent males and females—a general clinical research center-based study. *J Clin Endocrinol Metab*. 2000;**85**(7):2385–2394.
165. Veldhuis JD. Gender differences in secretory activity of the human somatotrophic (growth hormone) axis. *Eur J Endocrinol*. 1996;**134**(3):287–295.
166. Ho KY, Evans WS, Blizzard RM, Veldhuis JD, Merriam GR, Samojlik E, Furlanetto R, Rogol AD, Kaiser DL, Thorner MO. Effects of sex and age on the 24-hour profile of growth hormone secretion in man: importance of endogenous estradiol concentrations. *J Clin Endocrinol Metab*. 1987;**64**(1):51–58.
167. Veldhuis JD, Roelfsema F, Keenan DM, Pincus S. Gender, age, body mass index, and IGF-I individually and jointly determine distinct GH dynamics: analyses in one hundred healthy adults. *J Clin Endocrinol Metab*. 2011;**96**(1):115–121.
168. Veldhuis JD, Patrie JT, Brill KT, Weltman JY, Mueller EE, Bowers CY, Weltman A. Contributions of gender and systemic estradiol and testosterone concentrations to maximal secretagogue drive of burst-like growth hormone secretion in healthy middle-aged and older adults. *J Clin Endocrinol Metab*. 2004;**89**(12):6291–6296.
169. Roelfsema F, Veldhuis JD. Growth hormone dynamics in healthy adults are related to age and sex and strongly dependent on body mass index. *Neuroendocrinology*. 2016;**103**(3-4):335–344.
170. Pritzlaff-Roy CJ, Wideman L, Weltman JY, Abbott R, Gutgesell M, Hartman ML, Veldhuis JD, Weltman A. Gender governs the relationship between exercise intensity and growth hormone release in young adults. *J Appl Physiol*. 2002;**92**(5):2053–2060.
171. Leung KC, Doyle N, Ballesteros M, Sjogren K, Watts CK, Low TH, Leong GM, Ross RJ, Ho KK. Estrogen inhibits GH signaling by suppressing GH-induced JAK2 phosphorylation, an effect mediated by SOCS-2. *Proc Natl Acad Sci USA*. 2003;**100**(3):1016–1021.
172. Ho KK, O'Sullivan AJ, Wolthers T, Leung KC. Metabolic effects of oestrogens: impact of the route of administration. *Ann Endocrinol (Paris)*. 2003;**64**(2):170–177.
173. Cappola AR, Bandeen-Roche K, Wand GS, Volpato S, Fried LP. Association of IGF-I levels with muscle strength and mobility in older women. *J Clin Endocrinol Metab*. 2001;**86**(9):4139–4146.
174. Meinhardt U, Nelson AE, Hansen JL, Birzniece V, Clifford D, Leung KC, Graham K, Ho KK. The effects of growth hormone on body composition and physical performance in recreational athletes: a randomized trial. *Ann Intern Med*. 2010;**152**(9):568–577.
175. Harper J. Race times for transgender athletes. *Journal of Sporting Cultures and Identities*. 2015;**6**(1):1–9.
176. Bermon S. Androgens and athletic performance of elite female athletes. *Curr Opin Endocrinol Diabetes Obes*. 2017;**24**(3):246–251.
177. Elbers JM, Asscheman H, Seidell JC, Megens JA, Gooren LJ. Long-term testosterone administration increases visceral fat in female to male transsexuals. *J Clin Endocrinol Metab*. 1997;**82**(7):2044–2047.
178. Handelsman DJ. Clinical review: the rationale for banning human chorionic gonadotropin and estrogen blockers in sport. *J Clin Endocrinol Metab*. 2006;**91**(5):1646–1653.
179. Asbell SO, Leon SA, Tester WJ, Brereton HD, Ago CT, Rotman M. Development of anemia and recovery in prostate cancer patients treated with combined androgen blockade and radiotherapy. *Prostate*. 1996;**29**(4):243–248.
180. Strum SB, McDermid JE, Scholz MC, Johnson H, Tisman G. Anaemia associated with androgen deprivation in patients with prostate cancer receiving combined hormone blockade. *Br J Urol*. 1997;**79**(6):933–941.
181. Bogdanos J, Karamanolakis D, Milathianakis C, Repousis P, Tsintavis A, Koutsilieris M. Combined androgen blockade-induced anemia in prostate cancer patients without bone involvement. *Anti-cancer Res*. 2003;**23**(2C):1757–1762.
182. Choo R, Chander S, Danjoux C, Morton G, Pearce A, Deboer G, Szumacher E, Loblaw A, Cheung P, Woo T. How are hemoglobin levels affected by androgen deprivation in non-metastatic prostate cancer patients? *Can J Urol*. 2005;**12**(1):2547–2552.
183. Chander S, Choo R, Danjoux C, Morton G, Pearce A, Deboer G, Szumacher E, Loblaw A, Cheung P, Woo T. Effect of androgen suppression on hemoglobin in prostate cancer patients undergoing salvage radiotherapy plus 2-year buserelin acetate for rising PSA after surgery. *Int J Radiat Oncol Biol Phys*. 2005;**62**(3):719–724.
184. Golfam M, Samant R, Eapen L, Malone S. Effects of radiation and total androgen blockade on serum hemoglobin, testosterone, and erythropoietin in patients with localized prostate cancer. *Curr Oncol*. 2012;**19**(4):e258–e263.
185. Storer TW, Miciek R, Travison TG. Muscle function, physical performance and body composition changes in men with prostate cancer undergoing androgen deprivation therapy. *Asian J Androl*. 2012;**14**(2):204–221.

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Disclosure Summary: DJH. is a medical and scientific consultant for the IAAF and to the Australian Sports Anti-Doping Agency. He is a member of the World Anti-Doping Agency's Health, Medicine and Research Committee and of the IOC working group on hyperandrogenic female and transgender athletes. He has received institutional grant support from Besins Healthcare and Lawley for investigator-initiated clinical studies in testosterone pharmacology and has provided expert testimony in testosterone litigation. ALH. is a medical and scientific consultant for the Swedish Olympic Committee and a member of the IAAF and IOC working groups on hyperandrogenic female athletes and transgender athletes. She has received grant support from the IAAF for a study on testosterone and physical performance in women. SB. is a medical and scientific consultant for the IAAF and a member of the IAAF and IOC working groups on hyperandrogenic female athletes and transgender athletes. The authors have no other involvement with any entity having a financial interest in the material discussed in the manuscript. Opinions expressed in this review are the personal views of the authors and do not represent those of the IAAF, IOC, World Anti-Doping Agency, or Swedish Olympic Committee.

Abbreviations

AR, androgen receptor; CAH, congenital adrenal hyperplasia; CAIS, complete androgen insensitivity syndrome; DSD, disorder (or difference) of sex development; F2M, female-to-male; IAAF, International Association of Athletic Federations; IOC, International Olympic Committee; LC-MS, liquid chromatography–mass spectrometry; M2F, male-to-female; PAIS, partial androgen insensitivity syndrome; PCOS, polycystic ovary syndrome; SHOX, short stature homeobox.

Exhibit 27

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

B.P.J. by her next friend and mother, HEATHER JACKSON,

Plaintiff,

v.

WEST VIRGINIA STATE BOARD OF EDUCATION, HARRISON COUNTY BOARD OF EDUCATION, WEST VIRGINIA SECONDARY SCHOOL ACTIVITIES COMMISSION, W. CLAYTON BURCH in his official capacity as State Superintendent, DORA STUTLER in her official capacity as Harrison County Superintendent, and THE STATE OF WEST VIRGINIA,

Defendants,

and

LAINY ARMISTEAD,

Defendant-Intervenor.

Civil Action No. 2:21-cv-00316

Hon. Joseph R. Goodwin

EXPERT REPORT AND DECLARATION OF PROFESSOR MARY D. FRY, PHD

1. I have been retained by counsel for Plaintiff as an expert in connection with the above-captioned litigation.

2. The purpose of this expert report and declaration is to offer my expert opinion on: (1) the psychological and behavioral benefits of sports for youth and young adults (including collegiate athletes); and (2) the conditions that lend themselves to youth and young adults participating in athletics and accessing those benefits when they do participate.

3. I have knowledge of the matters stated in this expert report and declaration. I have collected and cite to relevant literature concerning the issues that arise in this litigation in the body of this expert report and declaration and in the attached bibliography.

4. In preparing this expert report and declaration, I reviewed West Virginia H.B. 3293, the bill at issue in this litigation.

5. In preparing this expert report and declaration, I relied on my education and training, my professional and research experience, and my knowledge of the literature in the pertinent fields. The materials I have relied upon in preparing this expert report and declaration are the same types of materials that experts in my field of study regularly rely upon when forming opinions on the subject. I may wish to supplement these opinions or the bases for them as a result of new research or publications or in response to statements and issues that may arise in my area of expertise.

PROFESSIONAL BACKGROUND

6. I am a Professor in the Department of Health, Sport & Exercise Sciences at the University of Kansas in Lawrence, Kansas. A true and correct copy of my Curriculum Vitae is attached hereto as Exhibit A.

7. In 1984, I graduated from Texas Wesleyan University in Fort Worth, Texas with a Bachelor of Science in Physical Education. After graduating, I spent about five years teaching physical education and coaching tennis at schools and summer camps in Texas and North Carolina.

8. I graduated with a Master of Science in Sport Psychology/Pedagogy from the University of North Carolina in Greensboro, North Carolina in 1990. Then, in 1994, I graduated with a doctorate in Sport & Exercise Psychology from Purdue University in West Lafayette, Indiana. From 1994 to 1999, I served as an Assistant Professor in the University of Memphis's

Department of Human Movement Sciences and Education. I continued at the same institution from 1999 to 2007 as an Associate Professor in the Department of Human & Sport Sciences. I joined the faculty of the University of Kansas in 2007, where I continue to teach and research as a Professor today.

9. I have authored or coauthored 69 papers in peer-reviewed journals, including many studies in sport psychology and youth athlete motivation. I have coauthored seven book chapters and one book, titled *A Coach's Guide to Maximizing the Youth Sport Experience: Work Hard and Be Kind*. I have also given 118 presentations on my research at both international and national conferences, as well as dozens of local and regional presentations.

10. I have taught and/or developed six undergraduate level courses and 12 graduate level courses in sport and exercise psychology. The courses I developed include Psychosocial Aspects of Sport, Applied Sport Psychology, Developmental Perspectives in Youth Sport, and Special Course: Sport Psychology Within Youth Sport.

11. On a national level, I have served with the Association of Applied Sport Psychology ("AASP") as a member of the Program Review Committee (2008-present), a Subject Matter Expert for the Certification Exam Committee (2018), and a member of the Ad-Hoc Future of AASP Committee (2012-2015). For the AASP, I have served as an Executive Board Member (2004-2006), two three-year terms as a member of the Social Psychology Section Committee (1996-99; 2001-2003), and as a member of the Dissertation Award Committee (1998; 2002). I have also served on the Editorial Board for *Physical Activity Today* (1997-2001) and on the Program Review Committee for the American Alliance of Health, Physical Education, Recreation & Dance (2009-2017), in addition to chairing the Committee in 2010. I also serve on the National Advisory Board for the Positive Coaching Alliance.

12. I have undertaken editorial roles on professional journals within my field, including as Associate Editor (2009-2012) and Editorial Board Member (2000-2009; 2013-present) for the *Journal of Applied Sport Psychology*; Associate Editor (2008-present) for the *Journal of Sport Psychology in Action*; Section Editor (2003-2006) and Reviewer (1994-present) for the *Research Quarterly for Exercise and Sport*; and Editorial Board Member (2011-present) for *Sport, Exercise, and Performance Psychology*.

13. I have served on the Kansas University Certificate in Sport Committee (2017-2018), and the Kansas University Center for Undergraduate Research, Advisory Board (2016-2018), among other roles at the University.

14. I am, or have been, a member of several professional organizations, including the American Psychological Association (2017-present), the Kansas Alliance for Health, Physical Education, Recreation, & Dance (2008-present), the American Alliance for Health, Physical Education, Recreation, and Dance (1988-2017), and the North American Society for the Psychology of Sport and Physical Activity (1988-2000).

15. I also have experience applying sport psychology in the field, which include mental skills interventions for various athletes and teams, including with high school and university athletes (2000-present), a high school baseball team (2013-2018), a youth baseball team (2009-2011), a Division I collegiate volleyball team (2008-2010), a high school basketball team (2006-2007), and a Division I cross-country team (2006).

16. I have not previously testified as an expert witness in either deposition or at trial.

17. I am being compensated at an hourly rate of \$250 per hour. My compensation does not depend on the outcome of this litigation, the opinions I express, or the testimony I provide.

**FOCUSING SOLELY ON PERFORMANCE OUTCOMES UNDERMINES THE
BENEFITS OF SPORT FOR YOUTH AND YOUNG ADULT ATHLETES**

18. For youth and young adult student-athletes, athletics serve a different purpose than for athletes who participate in professional athletics or world elite competition. A myopic focus on winning in youth and young adult athletics ignores the other important benefits that school athletics offer young athletes, such as teamwork and camaraderie, which are advanced when all athletes have the opportunity to play the sport they love and reap the benefits of such participation.

19. The National Collegiate Athletic Association (NCAA) estimates that there are eight million high school student-athletes in the United States.¹ Of those millions of athletes, only about 6% go on to compete at the college level in any division (with only about 2% earning an athletic scholarship).² By the numbers alone, the primary purpose of high school sports is not about preparing youth for college sports. For the 93% of high school athletes who do not compete in college as well as for those who do, youth sport creates a myriad of benefits unrelated to preparing athletes to compete in college.

20. Then for collegiate athletics, most athletes do not go on to have athletic careers beyond college in an elite sports context. According to the NCAA: “Fewer than two percent of NCAA student-athletes go on to be professional athletes.”³ That percentage does not include National Association of Intercollegiate Athletics (for small college sports) and junior college student-athletes, who are less likely to have professional sports careers. Accordingly, among total numbers of collegiate athletes in the United States, the total percentage of athletes who go on to participate in elite, professional athletics after college is even lower than two percent.

¹ <https://www.ncaa.org/about/resources/research/estimated-probability-competing-college-athletics>

² *Id.*; <https://www.ncaa.org/student-athletes/future/scholarships>

³ <https://www.nfhs.org/media/886012/recruiting-fact-sheet-web.pdf>

21. There are many benefits to young people from participating in athletic activities, discussed further herein. But understanding what motivates youth and young adults to participate in athletics in the first place is essential for understanding how they can access these benefits. One critical way to increase participation in athletics is to understand the factors that motivate individuals to stay engaged at different ages and in different contexts. Understanding motivation also helps to explain how the benefits youth and young adults derive from participating in sport translate to other aspects of their lives.

22. In simple terms, motivation is the desire to do activities. More formally, it is defined as “the process that influences initiation, direction, magnitude, perseverance, continuation, and quality of goal-directed behavior” (Maehr & Zusho, 2009). Motivation is about why, how, when, and in what circumstances people employ their resources.

23. One of the most-researched motivational theories in the field of sport psychology is achievement goal perspective theory, which was developed to address how motivation could be heightened and sustained over time (Nicholls 1984, 1989). Achievement goal perspective theory includes three components that together can work to optimize motivation among all individuals, including youth and young adults participating in sports.

24. First is the developmental component of achievement goal perspective theory. Young children are incapable of accurately comparing their ability to others, overestimate their ability, and are naturally focused on their effort as a marker of success. By the time they enter adolescence, however, they are able to distinguish the concepts of effort, luck, and ability.

25. Second, around 12 years of age, children achieve a mature understanding of the concept of ability and at that time adopt their own personal definitions of success, or “goal orientations.” The primary goal orientations are task and ego. Individuals with a “high task

orientation” define success based on their effort, improvement, and mastery of tasks over time. In contrast, a high ego orientation occurs when individuals define success in normative terms, only feeling successful when they outperform others. Individuals are to some degree both task- and ego-oriented; in fact, they can be high and/or low in both orientations.

26. Third, motivations are shaped by outside factors, which can reinforce a task orientation as opposed to an ego orientation. Specifically, athletes can perceive the environment that is created by coaches (but can also be influenced by parents and teammates) (Ames, 1992a, 1992b; Nicholls, 1984, 1989) as a task-involving or ego-involving climate. When the environment created by coaches and others is a caring environment, athletes are more likely to perceive the overall climate as task-involving. A caring environment is one where athletes feel safe, welcome, comfortable, and valued, and are treated with kindness and respect by all in the sport setting (Newton et al., 2007). A climate that is both task-involving and caring is one in which coaches do the following: recognize and reward effort and improvement; foster cooperation among teammates; make everyone feel they play an important role on the team; treat mistakes as part of the learning process; and encourage an atmosphere where everyone is treated with mutual kindness and respect.

27. A high task orientation, described above in Paragraph 25 is the key to optimizing motivation over time because effort and improvement – the keys to task orientation – are variables that individuals can more easily control. High task orientation results in athletes being more likely to seek challenge, exert high effort, and persist over time (Maehr & Zusho, 2009).

28. Perhaps the strongest finding within the goal orientation research links task orientation with high enjoyment. Throughout childhood and adolescence, and across a range of sports, athletes who define success based on their personal effort and improvement have more fun

playing their sport than those high in ego orientation (Schneider, Harrington, & Tobar, 2017; Seifriz, Duda, & Chi, 1992; Stephens, 1998; Stuntz & Weiss, 2009; van de Pol & Kavussanu, 2011). Importantly, goal orientations are also associated with the sources of enjoyment athletes identify. For example, youth athletes with a high task orientation more often report experiencing enjoyment from learning and having positive team interactions. In contrast, athletes high in ego orientation more often report experiencing enjoyment as a result of winning and having high perceived competence (Lochbaum & Roberts, 1993).

29. Another benefit of high task orientation in youth athletes is the strong and positive association with interpersonal and team dynamics (Balaguer, Duda, & Crespo, 1999; Ommundsen, Roberts, Lemyre, & Miller, 2005). Task orientation is positively correlated with peer acceptance, less conflict with peers, and greater satisfaction with the coach.

30. Athletes high in task orientation also report greater confidence and perceived ability, and task orientation has been correlated with both self and team efficacy and greater perceived competence (Magyar & Feltz, 2003; Seifriz et al., 1992; Stuntz & Weiss, 2009). Further, athletes high in task orientation report utilizing more adaptive coping strategies (Kim, Duda, & Gano-Overway, 2011; McCarthy, 2011). These adaptive outcomes have been found for middle school, high school, and collegiate athletes.

31. By contrast, ego orientation (i.e., the non-pejorative, descriptive term for defining success based on ability and performance outcomes), is not correlated with perceived ability in general. Confidence of athletes high in ego orientation was more often based on their perceptions of ability and having a strong physical presence, whereas athletes high in task orientation based their perceptions of confidence on their sense of feeling well prepared and mentally strong (Magyar and Feltz, 2003).

32. Athletes high in ego orientation report lower companionship and greater conflict with teammates (Balaguer et al., 1999), and there is no evidence to suggest they reap the benefits of enhanced social relationships that athletes with high task orientation do (Ommundsen et al., 2005). Despite the ego-involving climate's emphasis on performance outcomes, results across studies suggest that the benefits of a task-involving climate may have a direct impact on athletic performance and ultimately improve performance outcomes (Jackson & Roberts, 1992; McDonald, Cote, & Deakin, 2011). By contrast, no evidence currently points to an ego-involving climate leading to greater performance outcomes with young athletes.

33. There is also a consistently significant relationship between ego orientation and anxiety (Lochbaum et al., 2016). Young athletes with high ego orientation participating in a variety of sports have reported higher trait and state cognitive and somatic anxiety, as well as greater concentration disruption, maladaptive perfectionism, and concern over making mistakes (Grossbard, Cumming, Standage, Smith, & Smoll, 2007; Hall, Kerr, & Matthews, 1998; Ommundsen & Pedersen, 1999; Ommundsen et al., 2005; White & Zellner, 1996).

34. Even for athletes who are themselves highly ego-oriented, and who prioritize winning and external rewards, a task-involving and caring climate is preferable. Such a climate encourages young athletes to orient themselves toward a task-involved model for motivation and away from the stress-inducing ego-orientation, which will in turn garner the young person the benefits associated with a task-orientation. For example, Division I college athletes who perceived a task-involving climate on their teams reported having stronger mental skills including their use of goal setting, ability to concentrate, remain worry free, cope with adversity and peak under pressure, act with confidence, and be open to receiving feedback from coaches (Fry, Iwasaki, & Hogue, 2021). These findings would suggest that athletes with strong mental skills might also

perform better. Further, perceptions of an ego-involving climate have been linked to higher salivary cortisol responses (Hogue, Fry, & Fry, 2017). Cortisol is an important and necessary hormone, but in excess it can break down muscle tissue and interfere with the immune system.

35. Thus, the benefits associated with youth and young adult sport are not limited to whether athletes are winning competitions, where they are ranked in their sport, or what level of publicity they are getting. In fact, a focus exclusively on those things not only undermines an athlete's success in those areas but can compromise the holistic range of benefits derived from youth and young adult sport. Ultimately, athletes are more likely to reap the positive benefits associated with youth and young adult sports if they are task-involved, which places greater emphasis on effort, than if they are ego-involved, which would put greater emphasis on trappings of individual success.

36. It should be noted that the research findings described above, which highlight the relationships between goal orientations and numerous outcome variables, have been consistent for both boys and girls. In other words, within the body of research on athletes' goal orientations, results across studies reveal that task orientation is more often positively correlated with adaptive outcomes (e.g., intrinsic motivation), and ego orientation is more often negatively associated with maladaptive outcomes (e.g., worry) for both boys and girls (Fry & Moore, 2019; Roberts, 2012; Roberts, Nerstad, & Lemyre, 2018).

**EXCLUDING TRANSGENDER STUDENTS FROM PARTICIPATING IN
YOUTH AND YOUNG ADULT ATHLETICS WOULD DEPRIVE THEM AND THEIR
TEAMMATES OF A WIDE RANGE OF BENEFITS**

37. A goal of youth sport is to help young athletes have positive experiences across sport. This includes creating space for athletes to have fun, develop skills, make friends, increase their levels of physical activity, continue their participation over time, and learn valuable life

lessons (Thompson, 2010). If transgender students are arbitrarily excluded from youth sports, they are, in turn, deprived of those positive experiences and outcomes and their teammates are deprived of a genuinely optimal sport experience.

38. Athletes who participate in high school sport are more likely to finish college, and more likely to be actively engaged in planning for their future after their sport career ends (Chamberlin & Fry, 2020; Troutman & Defur, 2007). Many of the benefits to youth who participate in athletics are documented throughout life. For example, women who participated in high school sport see greater success in the business world (ESPNW & EY, 2017; Sasaki, 2020). When athletes are excluded from participating in sport, or are in a climate where they do not feel accepted or respected, they do not have the opportunity to reap these benefits.

39. In addition, arbitrarily excluding transgender students from teams undermines a task-involving climate, which, in turn, diminishes the positive outcomes for all youth and collegiate athletes. (Balaguer, Duda, & Crespo, 1999; Ommundsen, Roberts, Lemyre, & Miller, 2005). Fostering task orientation positively correlates with peer acceptance, less conflict with peers, and greater satisfaction with the coach. These outcomes help athletes have a sport experience that make them want to keep playing sport. Because these positive benefits are fostered in a task-involving environment, arbitrary exclusions can cause harm not only to the athletes who are excluded, but also to the other athletes on the team.

40. When a team, league, or organization adopts an ego-promoting philosophy, and cares only about performance outcomes, the broader benefits of sport are diminished for all involved (both with regard to their future athletic careers and lives outside of sport). As noted above, the overwhelming majority of high school athletes will never go on to compete in college, and the overwhelming majority of college athletes will never go on to compete on professional

teams. Focusing only on the highest-performing athletes or post-graduate elite athletics compromises the other critical benefits of sports for youth and young adults.

41. The climate of youth sport must be geared to include all participants, so that teams are more likely to help every athlete maximize their potential. From an educational perspective, it is optimal to encourage all athletes to do the best that they can, and to help all athletes enjoy the sport that they love.

42. For coaches of youth and young adult athletes, one important message is that, for the overwhelming majority of people, the period of time that a person participates in organized athletics is short and maximizing the benefits of that participation is essential. As Jim Thompson, Founder and former-CEO of the Positive Coaching Alliance notes: “Here’s the bottom line for parents. Your child’s experience with youth sports will come to an end, and it may happen suddenly. If you are like me, you will look back and think, ‘I wish I had enjoyed it more. I wish I hadn’t obsessed so much about how well my child was performing, or the team’s record, or whether he or she was playing as much as I wanted, or why the coach didn’t play him or her in the right position. I wish I had just enjoyed the experience more.’ Because the youth sports experience is so intense, we tend to forget how short it is and what a small amount of time parents and children get to spend together over the course of life.”

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: January 24, 2022


Professor Mary D. Fry, PhD

BIBLIOGRAPHY

- Allen, J., Taylor, J., Dimeo, P, Dixon, S., & Robinson, L. (2015). Predicting elite Scottish athletes' attitudes towards doping: Examining the contribution of achievement goals and motivational climate. *Journal of Sports Sciences*, 33, 899–906.
- Ames, C. (1992a). Achievement goals, motivational climate, and motivational processes. In *Motivation in sport and exercise* (pp. 161–176). Champaign, IL: Human Kinetics.
- Ames, C. (1992b). Classrooms: Goals, Structures, and Student Motivation. *Journal of Educational Psychology*, 84(3), 261–271. <https://doi.org/10.1037/0022-0663.84.3.261>
- Balaguer, I., Duda, J. L., & Crespe, M. (1999). Motivational climate and goal orientations as predictors of perceptions of improvement, satisfaction, and coach ratings among tennis players. *Scandinavian Journal of Medicine and Science in Sports*, 9, 381-388.
- Boixadós, M., Cruz, J., Torregrosa, M., & Valiente, L. (2004). Relationships among motivational climate, satisfaction, perceived ability, and fair play attitudes in young soccer players. *Journal of Applied Sport Psychology*, 16(4), 301–317. <https://doi.org/10.1080/10413200490517977>
- Boyce, B. A., Gano-Overway, L. a., & Campbell, A. L. (2009). Perceived motivational climate's influence on goal orientations, perceived competence, and practice strategies across the athletic season. *Journal of Applied Sport Psychology*, 21(January), 381–394. <https://doi.org/10.1080/10413200903204887>
- Boyd, M., Kim, M., Ensari, N. & Yin, Z. (2014). Perceived motivational team climate in relation to task and social cohesion among male college athletes. *Journal of Applied Social Psychology*, 44, 115–123.
- Cumming, S. P., Smoll, F. L., Smith, R. E., & Grossbard, J. R. (2007). Is winning everything? The relative contributions of motivational climate and won-lost percentage in youth sports. *Journal of Applied Sport Psychology*, 19(3), 322–336. <https://doi.org/10.1080/10413200701342640>
- Duda, J. L. (2013). The conceptual and empirical foundations of Empowering Coaching TM: Setting the stage for the PAPA project. *International Journal of Sport and Exercise Psychology*, 11(4), 311–318. <https://doi.org/10.1080/1612197X.2013.839414>
- Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology*, 84(3), 290–299. <https://doi.org/10.1037/0022-0663.84.3.290>
- Fry, M. D., & Hogue, C. M. (2018). Psychological considerations for children and adolescents in sport and performance. Oxford Research Encyclopedia of Psychology.

- Fry, M., & Moore, E. (2018). Motivation in sport: Theory and application. In M. H. Anshel (Ed.), T. Petrie, E. Labbe, S. Petruzello, & J. Steinfeldt (Assoc. Eds.), *APA Handbook of Sport and Exercise Psychology*. Vol 1. Sport Psychology (pp. 273–299). Sport psychology. Washington DC: American Psychological Association.
- Fry, M. D., & Newton, M. (2003). Application of Achievement Goal Theory in an urban youth tennis setting. *Journal of Applied Sport Psychology*, *15*(1), 50–66. <https://doi.org/10.1080/10413200305399>
- Fry, M. D., Gano-Overway, L., Guivernau, M., Kim, M., & Newton, M. (2020). A coach's guide to maximizing the youth sport experience: Work hard, be kind. New York: Routledge.
- Fry, M. D., & Gano-Overway, L. A. (2010). Exploring the contribution of the caring climate to the youth sport experience. *Journal of Applied Sport Psychology*, *22*(3), 294–304.
- Fry, M. D., Iwasaki, S., & Hogue, C. (2021). The relationship between the perceived motivational climate in elite collegiate sport and athlete psychological coping skills. *Journal of Clinical Sport Psychology*, *15*(4), 334–350.
- Gano-Overway, L. A., Newton, M., Magyar, T. M., Fry, M. D., Kim, M.-S., & Guivernau, M. R. (2009). Influence of caring youth sport contexts on efficacy-related beliefs and social behaviors. *Developmental Psychology*, *45*(2), 329–340. <https://doi.org/10.1037/a0014067>.
- Grossbard, J. R., Cumming, S. P., Standage, M., Smith, R. E., & Smoll, F. L. (2007). Social desirability and relations between goal orientations and competitive trait anxiety in young athletes. *Psychology of Sport and Exercise*, *8*(4), 491–505. <https://doi.org/10.1016/j.psychsport.2006.07.009>
- Hall, H. K., Kerr, A. W., & Matthews, J. (1998). Precompetitive anxiety in sport: The contribution of achievement goals and perfectionism. *Journal of Sport & Exercise Psychology*, *20*(2), 194–217.
- Harwood, C. G., Keegan, R. J., Smith, J. M. J., & Raine, A. S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. *Psychology of Sport and Exercise*, *18*, 9–25. <https://doi.org/10.1016/j.psychsport.2014.11.005>
- Hogue, C. M., Fry, M. D., & Fry, A. C. (2017). The differential impact of motivational climate on adolescents' psychological and physiological stress responses. *Psychology of Sport and Exercise*, *30*, 118–127. <https://doi.org/10.1016/j.psychsport.2017.02.004>
- Iwasaki, S., & Fry, M. D. (2016). Female adolescent soccer players' perceived motivational climate, goal orientations, and mindful engagement. *Psychology of Sport and Exercise*, *27*, 222–231. <https://doi.org/10.1016/j.psychsport.2016.09.002>

- Jackson, S. A., & Roberts, G. C. (1992). Positive performance states of athletes: Toward a conceptual understanding of peak performance. *Sport Psychologist, 6*(2), 156–171.
- Kavussanu, M., & Roberts, G. C. (2001). Moral functioning in sport: An achievement goal perspective. *Journal of Sport & Exercise Psychology, 23*(1), 37–54.
- Kim, M., Duda, J. L., & Gano-Overway (2011). Predicting occurrence of and responses to psychological difficulties: The interplay between achievement goals, perceived ability and motivational climates among Korean athletes. *International Journal of Sport and Exercise Psychology, 9*, 31–47.
- Lochbaum, M., Cetinkalp, Z. K., Graham, K., Wright, T., & Zazo, R. (2016). Task and ego goal orientations in competitive sport: A quantitative review of the literature from 1989 to 2016. *Kinesiology, 48*, 3–29.
- Maehr, M. L., & Zusho, A. (2009). Achievement goal theory: The past, present, and future. In K.R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 77–104). New York, NY: Routledge.
- Magyar & Feltz (2003). The influence of dispositional and situational tendencies on adolescent girls' sport confidence sources. *Psychology of Sport and Exercise, 4*, 175–190.
- McCarthy, J. J. (2011). Exploring the Relationship Between Goal Achievement Orientation and Mindfulness in Collegiate Athletics. *Journal of Clinical Sport Psychology, 5*(1), 44–57.
- MacDonald, D. J., Cote, J., Eys, M., Deakin, J. (2011). The role of enjoyment and motivational climate in relation to the personal development of team sport athletes. *Sport Psychologist, 25*, 32–46.
- Newton, M., Duda, J. L., & Yin, Z. (2000). Examination of the psychometric properties of the perceived motivational climate in sport questionnaire-2 in a sample of female athletes. *Journal of Sports Sciences, 18*(4), 275–290. <https://doi.org/10.1080/026404100365018>
- Newton, M., Fry, M. D., Watson, D. L., Gano-Overway, L. A., Kim, M., Magyar, T. M., & Guivernau, M. R. (2007). Psychometric properties of the Caring Climate Scale in a physical activity setting. *Revista de Psicología Del Deporte, 16*, 67–84. Retrieved from <file:///C:/Users/zar4559/Downloads/22-22-1-PB.pdf>
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*(3), 328–346. <https://doi.org/10.1037/0033-295X.91.3.328>
- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.
- Olympiou, A., Jowett, S., & Duda, J. L. (2008). The psychological interface between the coach-

created motivational Climate and the coach-athlete relationship in team sports. *Sport Psychologist*, 22(4), 423–438. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=35719365&lang=es&site=ehost-live&scope=site>

- Ommundsen, Y & Petersen, B.H. (1999). The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait and anxiety. *Scandinavian Journal of Medicine and Science in Sports*, 9, 333–343.
- Ommundsen, Y., Roberts, G. C., Lemyre, P.-N., & Miller, B. W. (2006). Parental and coach support or pressure on psychosocial outcomes of pediatric athletes in soccer. *Clinical Journal of Sport Medicine: Official Journal of the Canadian Academy of Sport Medicine*, 16(6), 522–526. <https://doi.org/10.1097/01.jsm.0000248845.39498.56>
- Poux, K. N., & Fry, M. D. (2015). Athletes' perceptions of their team motivational climate, career exploration and engagement, and athletic identity. *Journal of Clinical Sport Psychology*, 9(4), 360–372. <https://doi.org/10.1123/jcsp.2014-0050>
- Roberts, G. C. (2013). Advances in motivation and sport exercise. In D. C. Roberts, G. C. & Treasure (Ed.), *Advances in motivation in sport and exercise* (3rd Ed), pp. 5–58. Champaign, IL: Human Kinetics.
- Roberts, G. C., Nerstad, G. L., & Lemyre, P. N. (2018). Motivation in sport and performance. In O. Braddick (Ed.), *Oxford Research Encyclopedia of Psychology* (pp. 1–46). Oxford University Press.
- Sarrazin, P., Roberts, G. C., Cury, F., Biddle, S., & Famose, J.-P. (2002). Exerted effort and performance in climbing among boys: The influence. *Research Quarterly for Exercise and Sport*, 73(4).
- Sasaki, J. (2020). How can winning on the playing field prepare you for success in the boardroom? EY: Building a better world. https://www.ey.com/en_gl/women-fast-forward/how-can-winning-on-the-playing-field-prepare-you-for-success-in-the-boardroom
- Schneider, R. A. Y., Harrington, M., & Tobar, D. (2017). Goal orientation and how a task or ego mentality can affect the enjoyment for college hockey players. *College Student Journal*, 51(1), 57–62.
- Seifriz, J. J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport & Exercise Psychology*, 14, 375–391.
- Stephens, D. E., & Kavanagh, B. (2003). Aggression in Canadian youth ice hockey: The role of moral atmosphere. *International Sports Journal*, 7, 109–119.
- Stuntz & Weiss (2009). Achievement goal orientations and motivational outcomes in youth

sport: The role of social orientations. *Psychology of Sport and Exercise*, 10, 255–262.

Theeboom, M., Knop, P. De, & Weiss, M. R. (1995). Motivational climate, psychological responses, and motor skill development in children's sport: A field-based intervention study. *Journal of Sport & Exercise*, 17, 294–311.

Thompson, J. (2010). *Positive coaching: Building character and self-esteem through sports*. New York: Brown & Benchmark.

Troutman, K., & Dufur, M. (2007). From high school jocks to college grads: Assessing the long-term effects of high school sport participation on females' educational attainment. *Youth & Society*, 38(4), 443-462. doi:10.1177/0044118X06290651

Tudor, M. L., & Ridpath, B. D. (2018). Does the perceived motivational climate significantly predict academic and/or athletic motivation among NCAA Division I college athletes. *Journal of Contemporary Athletics*, 12(4), 291–307.

van De Pol, P. K. C., Kavussanu, M., (2011). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport & Exercise*, 12, 176–183.

White, S., & Zellner (1996). The relationship between goal orientation, beliefs about the causes of sport success, and trait anxiety among high school, intercollegiate, and recreational sport participants. *Sport Psychologist*, 10, 58–72.

Xiang, P., Bruene, A., & McBride, R. E. (2004). Using achievement goal theory to assess an elementary physical education running program. *Journal of School Health*, 74, 220–225.

EXHIBIT A

CURRICULUM VITAE

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EDUCATION

DEGREE	DISCIPLINE	INSTITUTION	YEAR
BS	Physical Education	Texas Wesleyan University	1984
MS	Sport Psychology/Pedagogy	University of North Carolina- Greensboro	1990
PhD	Sport & Exercise Psychology	Purdue University	1994

EXPERIENCE

RANK/POSITION	DEPARTMENT/DIVISION	INSTITUTION/ORG.	PERIOD
Professor	Health, Sport & Exercise Sci	University of Kansas	2019
Associate Professor	Health, Sport & Exercise Sci	University of Kansas	2007-2019
Associate Professor	Human & Sport Sciences	University of Memphis	1999-2007
Assistant Professor	Human Movement Sciences & Education	University of Memphis	1994-1999
Editorial Assistant	Journal of Applied Sport Psychology		1992-1994
Associate Investigator	Indiana Youth Risk Behavior Study for Disease Control	Indiana Dept. of Education/Centers	1992
Research Consultant	Grant to Study Youth Sports	National Institute for Fitness & Sport Indianapolis, IN	1991
Teaching Assistant	Health, Kinesiology & Leisure Studies	Purdue University	1990-1992
Teaching Assistant	Sport & Exercise Science	U. North Carolina-Greensboro	1989-1990

RANK/POSITION	DEPARTMENT/DIVISION.	INSTITUTION/ORG.	PERIOD
Middle School Teacher	Physical Education	Allen Middle School Greensboro, NC	1988-89
High School Teacher	Physical Education/English & Head Tennis Coach	Martin High School Arlington, TX	1987- 88
High School Teacher	Physical Education/English & Head Tennis Coach	Richland High School Fort Worth, TX	1984-87
Instructor	University of Texas-Austin	Summer Tennis Camps	1988 & 1989

Certification. Secondary Teacher Certification in English and Physical Education in the State of Texas, 1984.

HONORS/AWARDS:

Coleman Griffith Lecture, Association of Applied Sport Psychology (2021)
 Del Shankel Teaching Excellence Award (Recipient 2021; Finalist 2018, 2019)
 Budig Teaching Professorship, University of Kansas (2018)
 Outstanding Mentor, McNair Scholars Program (2017)
 KU Woman of Distinction, (2014-2015)
 Joyce Elaine Pauls Morgan HSES Teaching Award (2013)
 Budig Teaching Professorship, Nominee (2012)
 Bird Outstanding Mentor Award, Nominee (2011)
 Service Award, School of Education, University of Kansas, Nominee (2011)
 KU Keeler Professorship, University of Kansas (2010).
 Fellow, Association of Applied Sport Psychology (2009).
 Outstanding Research Article published in *Research Quarterly for Exercise & Sport* (1997).
 Presented by the Research Consortium of the American Alliance of Health, Physical Education, Recreation, & Dance.
 Outstanding Doctoral Dissertation, North American Society for the Psychology of Physical Activity (1994).
 Student Representative, CIC Big Ten Conference "Capstone of Knowledge" hosted by Michigan University, December, 1992.

RESEARCH PUBLICATIONS

Refereed Journal Publications

Easton, L., **Fry, M. D.**, Hogue, C. M., & Iwasaki, S. (in press). Goal orientations predict exercisers' effort and enjoyment while engaged in exercise and reasons for using a fitness tracker. *Acta Facultatis Educationis Physicae Universitatis Comenianae*.

Fry, M. D., Iwasaki, S., & Hogue, C. M. (in press). The relationship between the perceived motivational climate in elite collegiate sport and athlete psychological coping skills. *Journal of Clinical Sport Psychology*.

Hogue, C. M., **Fry, M. D.**, & Fry, A. C. (in press). The protective impact of learning to juggle in a caring, task-involving climate versus and ego-involving climate on participants' inflammation, cortisol, and psychological responses. *International Journal of Sport and Exercise Psychology*.

Iwasaki, S., **Fry, M. D.**, & Hogue, C.M. (in press). The relationship among male high school athletes' perceptions of the motivational climate, mindful engagement, and coachability. *Journal of Clinical Sport Psychology*.

Scott, C., **Fry, M.D.**, Wineinger, T., & Iwasaki, S., & Fry, M. D. (in press). Creating an optimal motivational team climate to help collegiate athletes thrive during the COVID-19 pandemic. *Journal of Sport Psychology in Action*.

Scott, C., **Fry, M. D.**, Weingartner, H., & Wineinger, T. (in press). Collegiate sport club athletes' psychological well-being and perceptions of their team climate. *Recreational Sports Journal*.

- Wineinger, T., **Fry, M. D.**, & Moore, E. W. (2021). Validation of climate and motivational measures for use in the biology laboratory setting. *Journal of Biological Education*.
- Brown, T. C., **Fry, M. D.**, Breske, M., Iwasaki, S., & Wilkinson, T. (2019). Motivational climate and athletes' likelihood of reporting concussions in a youth competitive soccer league. *Journal of Sport Behavior*, 42(1), 29-47.
- Fry, M. D.**, Reid, C., Iwasaki, S., & Thompson, J. (2019). Bridging theory, research, and practice in youth sports: Sport Psychology's Partnership with Positive Coaching Alliance to enhance youth sport. *Journal of Sport Psychology in Action*, 10, 1-10.
- Hogue, C. M. **Fry, M. D.**, & Iwasaki, S. (2019). The impact of the perceived motivational climate in physical education on adolescent greater life stress, coping appraisals, and experience of shame. *Sport, Exercise, & Performance Psychology*, 8, 273-289.
- Glover, K., & **Fry, M. D.** (2018). Helping WIN provide a winning environment for girls in their summer camps. *Journal of Sport Psychology in Action*, 9, 1-12.
- Miller, S., & **Fry, M. D.** (2018). Relationship between climate to body esteem and social physique anxiety within college physical activity classes. *Journal of Clinical Sport Psychology*, 12, 525-543.
- Wineinger, T. O. & **Fry, M. D.** (2018). The power of a caring/task-involving climate to help students find their life's passion. *Kansas Association for Health, Physical Education, Recreation, & Dance Journal*, 90 (1), 49-56.
- Breske, M. P., **Fry, M. D.**, Fry, A. C., & Hogue, C. M. (2017). The effects of goal priming on cortisol responses in an ego-involving climate. *Psychology of Sport and Exercise*, 32, 74-82.
- Brown, T. C., **Fry, M. D.**, & Moore, E. W. G. (2017). A motivational climate intervention and exercise-related outcomes: A longitudinal perspective. *Motivation Science*, 3, 337-353
- Chamberlin, J. & **Fry, M. D.** (2017). High school athletes' perceptions of the motivational climate in their off-season training programs. *Journal of Strength and Conditioning Research*, 31, 736-742.
- Fontana, M. S., & **Fry, M. D.** (2017). Creating and validating the shame in sport questionnaire. *Journal of Sport Behavior*, 40, 278-296.
- Hogue, C. M., **Fry, M. D.**, & Fry, A. C. (2017). The differential impact of motivational climates on adolescents' psychological and physiological stress responses. *Psychology of Sport and Exercise*, 30, 118-127. <http://dx.doi.org/10.1016/j.psychsport.2017.02.004>
- Fontana, M. S., **Fry, M. D.**, & Cramer, E. (2017). Exploring the relationship between athletes' perceptions of the motivational climate to their compassion, self-compassion, shame, and pride in adult recreational sport. *Measurement in Physical Education and Exercise Science*, 21, 101-111.
- Moore, E. W., G., & **Fry, M. D.** (2017). National franchise members' perceptions of the exercise psychosocial environment, ownership, and satisfaction. *Sport, Exercise, & Performance Psychology*, 6, 188-198.
- Moore, E. G. W., & **Fry, M. D.** (2017). Physical education students' ownership, empowerment, and satisfaction with PE and physical activity. *Research Quarterly for Exercise and Sport*, 88, 468-478. <https://doi.org/10.1080/02701367.2017.1372557>
- Iwasaki, S., & **Fry, M. D.** (2016). Female adolescent soccer players' perceived motivational climate, goal orientations, and mindful engagement. *Psychology of Sport & Exercise*, 27, 222-231. <http://dx.doi.org/10.1016/j.psychsport.2016.09.002>

- Claunch, J., & **Fry, M. D.** (2016). Native American football coaches' experience of a motivational climate collaboration with sport psychology researchers. *International Journal of Sport Science & Coaching*, *11*, 482-495. DOI: 10.1177/1747954116655047
- Brown, T. C., & **Fry, M. D.** (2015). Effects of an intervention with recreation center staff to foster a caring, task-involving climate. *Journal of Clinical Sport Psychology*, *9*, 41-58.
- Fontana, M., Bass, J., & **Fry, M. D.** (2015). From Smith Center to Coney Island: Examining the coaching climate in the United States sporting culture. *Journal of Contemporary Athletics*, *9*, 211-226.
- Fry, M. D.**, & Brown, T. C. (2015). A caring/task-involving climate intervention for youth sport camp leaders. *Kansas Association for Health, Physical Education, and Recreation Journal*.
- Moore, E. W. G., Brown, T. C., & **Fry, M. D.** (2015). Psychometric Properties of the Abbreviated Perceived Motivational Climate in Exercise Questionnaire. *Measurement in Physical Education and Exercise Science*, *19*(4), 186-199.
- Poux, K., & **Fry, M. D.** (2015). Athletes' perceptions of their team motivational climate, career exploration and engagement, and athletic identity. *Journal of Clinical Sport Psychology*, *9*, 360-372. <http://dx.doi.org/10.1123/jcsp.2014-0050>
- Brown, T. C. & **Fry, M. D.** (2014). College exercise class climates, physical self concept, and psychological well-being. *Journal of Clinical Sport Psychology*, *8*, 299-313.
- Brown, T. C. & **Fry, M. D.** (2014). Motivational climate, staff and members' behaviors, and members' psychological well-being at a large national fitness franchise. *Research Quarterly for Exercise and Sport*, *85*, 208-217.
- Moore, W. E. G, & **Fry, M. D.** (2014). Psychometric support for the Ownership in Exercise and Empowerment in Exercise Scales. *Measurement in Physical Education and exercise Science*, *18*, 1-17.
- Brown, T. C., & **Fry, M. D.** (2014). Evaluating the pilot of Strong Girls: A life skills/physical activity program for third and fourth grade girls. *Journal of Applied Sport Psychology*. *26*, 52-65.
- Brown, T. C. & **Fry, M. D.** (2013). Association between females' perceptions of college aerobic class motivational climates and their responses. *Women & Health*, *58*, 843-857.
- Brown, T. C., **Fry, M. D.**, & Little, T. (2013). The psychometric properties of the Perceived Motivational Climate in Exercise Questionnaire. *Measurement in Physical Education and Exercise Science* *17*(1), 17-39.
- Hogue, C. M., Pornprasertmanit, S., **Fry, M. D.**, Rhemtulla, M., & Little, T. (2013). Planned missing data designs for spline growth models in salivary cortisol research. *Measurement in Physical Education and Exercise Science*, *17*, 310-325.
- Iwasaki, S., & **Fry, M. D.** (2013). Evaluations of youth sport programs requested by sport administrators. *The Sport Psychologist*, *27*, 360-371.
- Hogue, C.M., **Fry, M. D.**, Fry, A.C., Pressman, S. D. (2013). The influence of a motivational climate intervention on participants' salivary cortisol and psychological responses. *Journal of Sport and Exercise Psychology*, *35*, 85-97.
- Fry, M. D.**, Guivernau, M., Kim, M., Newton, M., Gano-Overway, L, & Magyar, M. (2012). Youth perceptions of a caring climate, emotional regulation, and psychological well-being. *Sport, Exercise, & Performance Psychology*, *1*(1), 44-57.
- Huddleston, H., **Fry, M. D.**, & Brown, T. C. (2012). Corporate fitness members' perceptions of the environment and their intrinsic motivation. *Ravista de Psicologia del Deporte*.

- 21(1),15-23.
- Brown, T.C., & Fry, M. D. (2011). Helping members commit to exercise: Specific strategies to impact the climate at fitness centers. *Journal of Sport Psychology in Action*, 2, 70-80.
- Brown, T. C., & Fry, M. D. (2011). Strong Girls: A physical activity/life skills intervention for girls transitioning to junior high. *Journal of Sport Psychology in Action*, 2, 57-69.
- Fry, M. D. (2010). Creating a positive climate for young athletes from day 1. *Journal of Sport Psychology in Action*, 1(1), 33-41.
- Fry, M. D., & Gano-Overway, L. (2010). Exploring the contribution of the caring climate to the youth sport experience. *Journal of Applied Sport Psychology*, 22(3), 294-304.
- Dodd, R., Brown, T., & Fry, M. D. (2010). Young athlete's perceptions of their coaches' and teammates' caring and uncaring behaviors. *Kansas Association of Health Physical Education Recreation and Dance Journal*, 83(1), 38-45.
- Binkley, S. E., Fry, M. D., & Brown, T.C. (2009). The relationship of college students' perceptions of their BMI and weight status to their physical self-concept. *American Journal of Health Education*, 40, 139-145.
- Gano-Overway, L. A., Magyar, T. M., Kim, M., Newton, M., Fry, M. D., & Guivernau, M. R. (2009). Influence of caring youth sport contexts on efficacy-related beliefs and social behaviors. *Developmental Psychology*, 45, 329-340.
- Newton, M., Fry, M.D., Gano-Overway, L., Kim, M., Watson, D., & Givernau, M. (2007). Psychometric properties of the Contextual Caring Scale in a physical activity setting. *Revista de Psicología del Deporte*, 16, 67-84.
- Newton, M., Watson, D., Fry, M., Gano-Overway, L, Kim, M., & Givernau, M. (2007). The impact of caring in physical activity. *Urban Review*, 39, 281-299.
- Haneishi, K., Fry A.C., Moore C.A., Schilling B.K., Li Y., and Fry M.D. (2007). Cortisol and stress responses during a game and practice in female collegiate soccer players". *Journal of Strength and Conditioning Research*, 21, 583-588.
- Magyar, M., Kim, M., Givernau, M., Gano-Overway, L., Newton, M., & Fry, M. (2007). The influence of leader efficacy and emotional intelligence on personal caring. *Journal of Teaching in Physical Education*, 26, 310-319.
- Bone, J., & Fry, M.D. (2006). The influence of injured athletes' perceptions of social support from ATCs on athletes' beliefs about rehabilitation. *Journal of Sport Rehabilitation*, 15, 156-167.
- Fry, A.C., Ciroslan D., Fry M.D., LeRoux C.D., Schilling B.K., and Chiu L.Z.F. (2006), Anthropometric and performance variables discriminating elite junior weightlifters. *Journal of Strength and Conditioning Research*, 20, 861-866.
- Smith, S., Fry, M. D., Ethington, C., & Li, Y. (2005). The effects of athletes' perceptions of their coaching behaviors on their perceptions of the motivational climate. *Journal of Applied Sport Psychology*, 17, 1-8.
- Fry, M. D., & Newton, M. (2003). Application of achievement goal theory in an urban youth tennis setting. *Journal of Applied Sport Psychology* 15, 50-66.
- Abma, C. L., Fry, M. D., Li, Y., & Relyea, G. (2002). Differences in imagery content and imagery ability between high and low confident track and field athletes. *Journal of Applied Sport Psychology*, 13, 341-349.
- Walling, M. D., Duda, J. L., & Crawford, T. (2002). Goal orientations, outcome, and responses to youth sport competition among high/low perceived ability athletes. *International Journal of Sport Psychology*, 14, 140-156.

- Fry, M. D.** [2000]. A developmental examination of children's understanding of task difficulty in the physical domain. *Journal of Applied Sport Psychology*, 12, 180-202.
- Fry, M. D.** (2000). A developmental analysis of children's and adolescents' understanding of luck and ability in the physical domain. *Journal of Sport and Exercise Psychology*, 22, 145-166.
- Fry, A.C., Webber, J. M., Weiss, L.W., **Fry, M. D.**, & Li, Y. (2000). Impaired performances with excessive high-intensity free-weight training. *Journal of Strength and Conditioning Research*, 14, 54-61.
- Fry, M. D.**, & Lattimore, D. (2000). Fostering a positive motivational climate in physical education. *Tennessee Educational Leadership Journal*, 27, 39-43.
- Fry, M. D.**, & Fry, A. C. (1999). Goal perspectives and motivational responses of elite junior weightlifters. *Journal of Strength and Conditioning Research*, 13, 311-317.
- Newton, M., & **Fry, M. D.** (1998). Senior Olympians achievement goals and beliefs concerning success. *Journal of Aging and Physical Activity*, 6, 256-270.
- Fry, M. D.** (1998). Al Oerter: An Olympian's views as seen from a sport psychology perspective. *Strength and Conditioning*, 20, 7-14.
- Fry, M. D.** & Duda, J. L. (1997). A developmental examination of children's understanding of effort and ability in the physical and academic domains. *Research Quarterly for Exercise and Sport*, 66, 331-344.
- Walling, M. D.**, & Duda, J. L. (1995). Goals and their associations with beliefs about success in and perceptions of the purpose of physical education. *Journal of Teaching in Physical Education*, 14, 140-156.
- Walling, M. D.**, & Duda, J. L. (1995). Motivating kids: Balance learning and fun. *Sport Psychology Training Bulletin*, 4, 1-8.
- Duda, J. L., Chi, L., Newton, M. L., **Walling, M. D.**, & Catley, D. (1995). Task and ego orientation and intrinsic motivation in sport. *International Journal of Sport Psychology*, 26, 40-63.
- Walling, M. D.**, & Martinek, T. (1995). Learned helplessness in a sixth-grade physical education student: A case study. *Journal of Teaching in Physical Education*, 14, 454-466.
- Walling, M. D.**, Duda, J. L., & Chi, L. (1993). The perceived motivational climate in sport questionnaire: Construct and predictive validity. *Journal of Sport and Exercise Psychology*, 15, 172-183.

Invited Book Chapters

- Gano-Overway, L., & **Fry, M. D.** (in press). Caring climates. In L. Davis, R. Keegan, & S. Jowett (Eds.), *Social Psychology of Sport* (Second Edition). Champaign, IL: Human Kinetics.
- Fry, M. D.**, & Fontana, M. (in press). Did you hear the one about the hilarious professor? Yeah, me neither: Incorporating humor in sport psychology to enhance motivation and relieve stress. In K. Vaidya (Ed.), *Teach Exercise & Sport With a Sense of Humor: Why and How to Be a Funnier and More Effective Exercise & Sport Teacher and Laugh All the Way to Your Classroom?* Curious Academic Publishing.

- Fry, M. D., & Hogue, C. M.** (2021). Foundational psychological theories, models, and constructs. *Certified Mental Performance Consultant Essentials Resource Guide*. Association for Applied Sport Psychology.
- Fry, M. D., & Moore, E. W. G.** (2019). *Motivation in sport: Theory to application*. In M. H. Anshel (Ed.), T. Petrie, E. Labbe, S. Petruzello, & J. Steinfeldt (Assoc. Eds.), *APA handbook of sport and exercise psychology: Vol. 1. Sport psychology*. Washington DC: American Psychological Association.
- Fry, M. D., & Hogue, C. M.** (2018). Psychological considerations for children in sport and performance. In Oliver Braddick (Ed.), *Oxford Research Encyclopedia of Psychology*. New York: Oxford University Press.
- Fry, M. D.** (2014). Sport and Exercise Psychology as a Venue to Develop “Difference Makers”. In K. Vaidya (Ed.), *Exercise and Sports for the Curious: Why Study Exercise and Sports*. Curious Academic Publishing.
- Fry, M. D.** (2001). The development of motivation in children. In G. Roberts (Ed.), *Motivation in sport and exercise (2nd Ed.)*, pp. 51-78, Champaign, IL: Human Kinetics.

Book

- Fry, M. D., Gano-Overway, L., Guivernau, M., Kim, M., & Newton, M.** (2020). *A Coach’s Guide to Maximizing the Youth Sport Experience: Work Hard and Be Kind*. NY: Routledge.

PRESENTATIONS

Invited International Presentations

- Fry, M. D.** (2019). *Achievement goal perspective theory as a framework for interventions in sport and physical activity*. Autonomous University of Baja California; Ensenada, Mexico.
- Fry, M. D.** (2019). *Utilizing goal orientations as a lens to optimize athletes’ motivation*. Autonomous University of Baja California; Ensenada, Mexico.
- Fry, M. D.** (2019). *Building a caring and task-involving climate in sport through words, activities, and core values*. Autonomous University of Baja California; Ensenada, Mexico.
- Fry, M. D.** (2019). *Team building to foster positive relationships on sport teams*. Autonomous University of Baja California; Ensenada, Mexico.
- Fry, M. D.** (2016). *The power of a caring and task-involving climate in sport*. Children International; Guatemala City, Guatemala/.
- Fry, M. D.** (2005, March). *Creating a positive motivational climate in physical activity settings*. Sao Paulo, Brazil.
- Duda, J. L., & **Walling, M. D.** (1993, November). *Toward a developmental theory of motivation in sport*. University of Barcelona, Barcelona, Spain.
- Walling, M. D.** (1993, November). *The examination of Nicholls’ developmental theory of motivation in the physical domain*. University of Valencia, Valencia, Spain.
- Walling, M. D.** (1993, November). *Motivational aspects in physical education for school-age Children*. National Physical Education Institute, Lleida, Spain.
- Duda, J. L., & **Walling, M. D.** (1993, November). *A conceptual and empirical examination of the motivational climate created by coaches*. University of Barcelona, Barcelona, Spain.

Refereed Presentations at National Conferences

- Scott, C., **Fry, M. D.**, Wineinger, T. O., & Iwasaki, S. (2021). *Staying positive during the COVID-19 Pandemic: The impact of collegiate team climate*. Association for Applied Sport Psychology, Virtual.
- Wineinger, T. O., Rosen, D., & **Fry, M. D.** (2021). *The influence of a motivational intervention on participants' physiological measures of effort and muscle performance*. Association for Applied Sport Psychology, Virtual.
- Scott, C., **Fry, M. D.**, Wineinger, T., & Weingartner, H. (2020). *Collegiate sport club athletes' perceptions of the climate on their teams and indices of their psychological well-being*. Association for Applied Sport Psychology, Virtual.
- Wineinger, T. O., & **Fry, M. D.** (2020). *A sport psychology lab partners with the Women's Intersport Network (WIN) to optimize young girls' sport camp experiences*. Association for Applied Sport Psychology, Virtual.
- Fry, M. D.**, Claunch, J., Hogue, C. M., Iwasaki, S., & Peynetsa, I. (2019). *A coaching education collaboration for American Indian Youth Sport Coaches on the Zuni Reservation*. Association for Applied Sport Psychology. Portland, OR.
- Moore, E. W. G., & **Fry, M. D.** (2018). *Elementary physical education students' motivational climate perceptions predict goal orientations and physical education satisfaction*. International Society of Behavioral Nutrition and Physical Activity. Hong Kong.
- Pan, T. Y., Davis, A. M., Atchley, R. A., Forbush, K. T., Wallace, D. P., Savage, C. R., & **Fry, M.D.** (2018). *The longitudinal relationship between obesity and depression in children*. American Psychological Association, San Francisco, CA.
- Warlick, C., Krieshok, T., Frey, B., Kerr, B., . . . & **Fry, M. D.** (2018). *Does hope matter? Examining a popular positive psychology construct in a DBT intensive-outpatient community health population*. Association for Behavioral and Cognitive Therapies.
- Breske, M., **Fry, M. D.**, A., & Hogue, C. M. (2017). *The effects of goal priming on cortisol responses in an ego-involving climate*. Association for Applied Sport Psychology, Orlando, FL.
- Chamberlin, J., **Fry, M. D.**, & Iwasaki, S. (2017). *The influence of high school athletes' perceptions of the motivational climate on athletic identity and academic endeavors*. Association for Applied Sport Psychology, Orlando, FL.
- Easton, L., **Fry, M. D.**, & Iwasaki, S. (2017). *The relationship of fitness center members' goal orientations and perceptions of the motivational climate to variables related to well-being and motivational responses*. Association for Applied Sport Psychology, Orlando, FL.
- Fontana, M. & **Fry, M. D.** (2017). *Exploring the relationship between motivational climate and shame*. Association for Applied Sport Psychology, Orlando, FL.
- Fry, M. D.**, Thompson, J., Iwasaki, S., & Reid, C. (2017). *Bridging theory, research, and practice in youth sports: sport psychology's partnership with positive coaching alliance to enhance youth sport*. Association for Applied Sport Psychology, Orlando, FL.
- Glover, K., **Fry, M. D.**, & Weingartner, H. (2017). *Helping a women's intersport network provide a winning experience for girls in their summer sport camps*, Association for Applied Sport Psychology, Orlando, FL.

- Iwasaki, S., & **Fry, M. D.** (2017). *An exploration of the relationship among female adolescent athletes' perceptions of the motivational climate, goal orientation, refocusing, and peak ability*. International Society of Sport Psychology 14th World Congress, Sevilla, Spain.
- Tyler, E., Warlick, C., Cole, B., & **Fry, M. D.** (2017). *Collegiate student-athletes' perceptions of their sport team climate and level of hope*. Association for Applied Sport Psychology, Orlando, FL.
- Tyler, E., Warlick, C., Cole, B., & **Fry, M. D.** (2017). *Relationship among student-athletes' perceptions of the climate, locker room talk, and sexual behaviors*. Association for Applied Sport Psychology, Orlando, FL.
- Hogue, C. M., **Fry, M. D.**, & Fry, A. C. (2017). *Adolescents' Physiological Stress Responses to Motivational Climate in a Physical Education Setting*. Society for Physical Education and Health, Boston, MA.
- Claunch, J. & **Fry, M. D.** (2016). *Setting the stage for a motivational climate collaboration*. Association for Applied Sport Psychology, Phoenix, AZ.
- Chamberlin, J., **Fry, M. D.**, & Iwasaki, S. (2016). *High school athletes' perceptions of the motivational climate in their off-season Training Programs*. Association for Applied Sport Psychology, Phoenix, AZ.
- Easton, L., Iwasaki, S., & **Fry, M. D.** (2016). *The relationship of members' perceptions of the motivational climate to their Psychological well-being at a university medical center fitness facility*. Association for Applied Sport Psychology, Phoenix, AZ.
- Fry, M. D.**, Iwasaki, S., Vanorsby, H., & Breske, M. (2016). *Masters' swimmers' perceptions of the climate in their training facilities and their motivational responses*. Association for Applied Sport Psychology, Phoenix, AZ.
- Fry, M. D.**, Solomon, G., Iwasaki, S., Madeson, M., Vanorsby, H., Meisinger, R., & Haberer, J. (2016). *Division I athletes' perceptions of their team climate, mental skills, and mindfulness*. Association for Applied Sport Psychology, Phoenix, AZ.
- Hogue, C. M., **Fry, M. D.**, & Fry, A. C. (2016). *Physiological and psychological stress responses to a motivational climate intervention*. Association for Applied Sport Psychology, Phoenix, AZ.
- Fontana, M., & **Fry, M. D.** (2016). *Creating and validating the Shame in Sport Questionnaire*. Association for Applied Sport Psychology, Phoenix, AZ.
- Hogue, C. M., & **Fry, M. D.** (2016). *Leader observations of participant behaviors during a motivational climate intervention: A qualitative investigation*. Association for Applied Sport Psychology, Phoenix, AZ.
- Iwasaki, S., & **Fry, M. D.** (2016). *Male High School Athletes' Perceptions of Their Team Climate and Mindful Engagement*. Association for Applied Sport Psychology, Phoenix, AZ.
- Iwasaki, S., **Fry, M. D.**, Vanorsby, H., Breske, M. (2016). *Master swimmers' perceptions of the climate in their training facilities and their motivational responses*. Association for Applied Sport Psychology, Phoenix, AZ.
- Brown, T. C., M. S., **Fry, M. D.**, Breske, M., Iwasaki, S., & Wilkinson, T. (2015). *High school athletes' perceptions of their sport team climate and their willingness to report concussion symptoms*. Association for Applied Sport Psychology, Indianapolis, IN.
- Fry, M. D.**, Brown, T. C., Iwasaki, S., Breske, M., & Wilkinson, T. (2015). *Middle school athletes' perceptions of their sport team climate and their willingness to report concussion symptoms*. Association for Applied Sport Psychology, Indianapolis, IN.

- Fry, M. D., & Easton, L.** (2015). *Health in Action: Helping students design creative interventions onsite*. Kansas Alliance for Physical Education, Health, Recreation, & Dance, Wichita, KS.
- Fontana, M. S., Iwasaki, S., Hogue, C., Claunch, J., Poux, K., & **Fry, M. D.** (2014). *Initiating mental skills training with a high school freshman baseball*. Association for Applied Sport Psychology, Las Vegas, NE.
- Fry, A.C., **Fry, M. D.**, Sterczala, A. J., Chiu, L. Z. F., Schilling, B., & Weiss, L. W. (2014). *High power resistance exercise overreaching can be monitored with a training questionnaire*. National Strength and Conditioning Association, Las Vegas, NE.
- Medina, R, **Fry, M. D.**, & Iwasaki, S. (2014). *Youngsters' perceptions of the climate and their experiences in recreational exercise classes*. Association for Applied Sport Psychology, Las Vegas, NE.
- Rosen, D., & **Fry, M. D.** (2014). *Motivational climate and seniors' experiences in group exercise classes*. Association for Applied Sport Psychology, Las Vegas, NE.
- Hogue, C. M., & **Fry, M. D.** (2013). *A qualitative examination of participant reactions to a motivational climate intervention*. Association for Applied Sport Psychology, New Orleans, LA.
- Kwon, S., & **Fry, M. D.** (2013). *Mediational role of interest and intrinsic motivation between perceived caring climate and satisfaction and attitudes among physical education students*. Association for Applied Sport Psychology, New Orleans, LA.
- Moore, E. W. G., & **Fry, M. D.** (2013). *PE teachers' perspective on a motivational climate professional development session*. Association for Applied Sport Psychology, New Orleans, LA.
- Claunch, J. & **Fry, M. D.** (2013). *Transformative learning experience: Collegiate football coaches' perceptions of participating in a motivational climate intervention*. Association for Applied Sport Psychology, New Orleans, LA.
- Moore, E. W. G., & **Fry, M. D.** (2012). *Goal orientations, motivational climate, and outcomes in physical education across one semester*. Association for Applied Sport Psychology to held in Atlanta, GA.
- Kwon, S., & **Fry, M. D.** (2012). *The change of physical educators' enjoyment and intrinsic motivation of track and field through PST*. Association for Applied Sport Psychology, Atlanta, GA.
- Iwasaki, S., & **Fry, M. D.** (2012). *Physical education students' perceptions of the climate and their psychological well-being*. Association for Applied Sport Psychology, Atlanta, GA.
- Hogue, CM., **Fry, M.D.**, Fry, A.C., & Pressman, S. D. (2012). *Participant salivary cortisol and psychological responses to a motivational climate intervention*. Association for Applied Sport Psychology, Atlanta, GA.
- Fry, M. D.**, Brown, T. C., & Iwasaki, S. (2012). *Girls' self perceptions after participating in a positive life skills/physical activity program*. Association for Applied Sport Psychology, Atlanta, GA.
- Brown, T. C., & **Fry, M. D.** (2012). *Results of a caring, task-involving climate intervention at a recreation center*. Association for Applied Sport Psychology, Atlanta, GA.
- Kwon, S., & **Fry, M. D.** (2011). *The effects of athletes' self-management on their self-confidence*. Association for Applied Sport Psychology, Honolulu, HI.
- Andre, M. J., Fry, A.C., Gallagher, P. M., Vardiman, P., **Fry, M. D.** Kudrna, B., Gandy-Moody,

- N., & McCartney, M. (2011). *The effects of a pre-workout caffeine supplement on endogenous growth hormone levels*. A presentation made at the meeting of the National Strength and Conditioning Association, Las Vegas, NE.
- Hogue, C. M., Iwasaki, S., & Fry, M. D. (2011). *A case study of a physical activity/mental skills training intervention with a young athlete*. Association for Applied Sport Psychology, Honolulu, HI.
- Iwasaki, S., & Fry, M. D. (2011). *The exploration of motivational climate in a youth sport basketball camp*. Association for Applied Sport Psychology, Honolulu, HI.
- Fry, M. D. (2011). *From the Strong Girls' viewpoints: Research results from semester 1*. Association for Applied Sport Psychology, Honolulu, HI.
- Fry, M. D. (2011). *The exercise climate: An introduction to the research on examining task-involving and caring climates in the exercise domain*. Association for Applied Sport Psychology, Honolulu, HI.
- Fry, M. D., Hogue, C. M., Sauer, S. (2011). *Using digital storytelling as a creative tool in health*. American Alliance of Health, Physical Education, Recreation, & Dance, San Diego, CA.
- Kwon, S., & Fry, M. D. (2010). *Relationship of exercisers' perceptions of the motivational climate to their flow experience*. Association of Applied Sport Psychology, Providence, RI.
- Iwasaki, S., Merczek, K., & Fry, M. D. (2010). *Young athletes' experiences in a volleyball camp*. Association of Applied Sport Psychology, Providence, RI.
- Iwasaki, S., Sogabe, A., Fry, M. D., & Christensen, E. (2010, June). *Differences in aggression and social skills among judo and non-judo practitioners*. American College of Sports Medicine, Baltimore, MD.
- Hogue, C. M., Fry, M. D., & Brown, T. C. (2010). *Incorporating team building activities in a summer day camp for children: Lessons learned*. Association of Applied Sport Psychology, Providence, RI.
- Brown, T. C., & Fry, M. D. (2010). *Caring climate intervention for sport skills and fitness camp leaders*. Association of Applied Sport Psychology, Providence, RI.
- Brown, T. C., & Fry, M. D. (2010). *Teaching life skills in a physical activity after-school program*. American School Health Association, Kansas City, MO.
- Moore, E. W., & Fry, M. D. (2009). *The effect of a caring and task-involving climate on student empowerment and ownership in physical activity classes*. Association for Applied Sport Psychology, Salt Lake City, UT.
- Kwon, S., & Fry, M. D. (2009). *Members' perceptions of their fitness club climate and their exercise flow*. Association for Applied Sport Psychology, Salt Lake City, UT.
- Hogue, C. M., Fry, M. D., & Dodd, R. (2009). *Athletes' perceptions of the climate at their training centers and their motivational responses*. Association for Applied Sport Psychology, Salt Lake City, UT.
- Fry, M. D. (2009). *From theory to practice: Creating positive and caring environments in the real world*. Association for Applied Sport Psychology, Salt Lake City, UT.
- Brown, T. C., & Fry, M. D. (2009). *Students' perceptions of their exercise class environment and their psychological well-being*. Association for Applied Sport Psychology, Salt Lake City, UT.
- Marshall, K., Stephens, L., Grindle, V., Fry, M. D., & Li, Y. (2009). *Mental imagery and EEG*

- activity in elite and novice collegiate soccer players.* Association for Applied Sport Psychology to be, Tampa, FL.
- Brown, T. C., & Fry, M. D. (2009). *Participants' perceptions of a caring and positive climate in their exercise classes.* American Alliance of Health, Physical Education, Recreation, & Dance, Tampa, FL.
- Fry, M. D., Dodd, R. K., & Brown, T. C. (2008). *Young athletes' perceptions of their coaches' and teammates' caring and uncaring behaviors.* Association for Applied Sport Psychology, St. Louis, MO.
- Binkley, S.E., & Fry, M. D. (2007). *The relationship of college students' perceptions of their BMI and weight status to their physical self-concept.* Association for Applied Sport Psychology, Louisville, KY.
- Smith, H., Fry, M.D., Li, Y., & Weiss, L. (2006). *The relationship of anxiety and self-confidence to treadmill exercise tolerance tests performance by sedentary obese women.* Association for the Advancement of Applied Sport Psychology, Miami, FL.
- McCarty, L., Fry, M.D., & Curly, C. (2006). *The relationship of a caring climate to motivational responses and psychological well-being in youth baseball.* Association for the Advancement of Applied Sport Psychology, Miami, FL.
- Gano-Overway, L. A., Newton, M., Magyar, AM., Fry, M. D., Kim, M., & Guivernau, M. (2006). *Caring, self-regulatory efficacy, empathic efficacy, and prosocial/antisocial behaviors in a physical activity setting.* Association for the Advancement of Applied Sport Psychology, Miami, FL.
- Fry, A.C., Haneishi, K., Moore, C.A., Schilling, B.K., Li, Y., & Fry, M.D. (2006). *Cortisol and stress responses during a game and practice in female collegiate soccer players.* National Conference on Student Assessment, Washington, D.C.
- Bricker, J. B., & Fry, M. D. (2005). *The influence of injured athletes' perceptions of social support from their certified athletic trainers on athletes' beliefs about rehabilitation.* Association for the Advancement of Applied Sport Psychology, Vancouver, British Columbia, Canada.
- Magyar, M., Guivernau, M., Gano-Overway, L., Newton, M., Fry, M.D., Kim, M., & Watson, D. (2005). *Exploring the relationship between the caring climate and achievement goal theory among underserved youth in physical activity.* American Alliance of Health, Physical Education, Recreation & Dance, Chicago, IL.
- Fry, M.D., & Newton, M. (2004, September). *The development of the Caring Climate Questionnaire.* Association for the Advancement of Applied Sport Psychology, Minneapolis, MN.
- Smith, S., Fry, M.D., & Ethington, C. (2004, September). *The effect of female athletes' perceptions of their coaches' behaviors on their perceptions of the motivational climate.* Association for the Advancement of Applied Sport Psychology, Minneapolis, MN.
- McCay, K., & Fry, MD. (2004, September). *The examination of goal perspective theory in relationship to measures of psychological well-being.* Association for the Advancement of Applied Sport Psychology, Minneapolis, MN.
- McCay, K., & Fry, M.D. (2004, March). *Predictors of adolescent depression: The role of physical activity and body image.* Society of Behavioral Medicine, Baltimore, MD.
- Henry, H., & Fry, M.D. (2003, October). *Corporate fitness members' perceptions of the*

- motivational climate, their intrinsic motivation, and perceptions of being valued by their employer.* Association for the Advancement of Applied Sport Psychology, Philadelphia, PA.
- Fry, M.D.,** Pittman, L., McCay, K., & Wendell, M. (2003, October). *A qualitative examination of underserved 4th grade girls' views about physical education.* Association for the Advancement of Applied Sport Psychology, Philadelphia, PA.
- Fry, M. D.,** Abma, C., Wood, J., & Melland, B. (2002, October). *The effects of an after-school physical activity and life skills program on 4th graders' self concept, motivational perspectives, and fitness levels.* Association for the Advancement of Applied Sport Psychology, Tucson, AZ.
- Abma, C., & **Fry, M. D.** (2002, October). *The effects of an imagery intervention on the trait confidence levels of female college volleyball players.* Association for the Advancement of Applied Sport Psychology, Tucson, AZ.
- Duda, J.L., Smith, M., & **Fry, M. D.** (2002, June). *An examination of learned helpless responses among young children engaged in physical tasks.* North American Society for the Psychology of Sport and Physical Activity, Baltimore, MD.
- Newton, M., **Fry, M.D.,** & Bernhardt, P. (2001, October). *Examination of the interactive relationship of goal orientations, perceptions of the motivational climate, and perceived ability in youth tennis players.* Association for the Advancement of Applied Sport Psychology, Orlando, FL.
- Abma, C. & **Fry, M. D.** (2001, May). *A qualitative examination of underserved 8th grade female students' attitudes about physical education.* 10th World Congress of Sport Psychology held in Skiathos, Greece.
- Lattimore, D., **Fry, M. D.,** & Balas, C. (2000, October). *Students' perceptions of the motivational climate and their motivational responses in physical education.* Association for the Advancement of Applied Sport Psychology, Nashville, TN.
- Fry, M. D.,** Lattimore, D., & Balas, C. (2000, October). *A developmental examination of children's accuracy in judging their physical ability in physical education.* Association for the Advancement of Applied Sport Psychology, Nashville, TN.
- Fry, M.D.,** & Newton, M. (1999, September). *Goal orientations, perceptions of the motivational climate, and motivational responses of urban youth tennis players.* Association for the Advancement of Applied Sport Psychology, Banff, Canada.
- Fry, M. D.,** Lattimore, D., & Balas, C. (1999, September). *A developmental analysis of conceptions of effort and physical ability among underserved youth.* Association for the Advancement of Applied Sport Psychology, Banff, Canada.
- Harber, M. P., **Fry, M. D.,** & Fry, A. C. (1998). *Sources of stress identified by elite collegiate weightlifters.* A paper presented at the annual meeting of the National Strength and Conditioning Association, Nashville, TN.
- Fry, M. D.,** Fry, A. C., & Newton, M. (1997, September). *Sources of stress identified by elite junior weightlifters.* Association for the Advancement of Applied Sport Psychology, San Diego, CA.
- Newton, M., **Fry, M. D.,** & Sandberg, J. (1997). *Goal orientations and purposes of sport and beliefs concerning success among senior Olympians.* North American Society for the Psychology of Sport and Physical Activity, Denver, CO.
- Fry, M. D.** (1997, March). *Symposium: Goal perspectives in physical education and sport:*

- Theory into practice*. American Alliance for Health, Physical Education, Recreation, and Dance, St. Louis, MO.
- Fry, M. D.** (1996, October). *Children's understanding of luck and ability: A developmental analysis*. Association for the Advancement of Applied Sport Psychology, Williamsburg, VA.
- Fry, M. D.** (1996, October). *The motivational climate in sport and physical education: An introduction to theory and research*. Association for the Advancement of Applied Sport Psychology, Williamsburg, VA.
- Fry, M. D., & Fry, A. C.** (1996, June). *Goal perspectives and motivational responses of elite junior weightlifters*. National Strength and Conditioning Association, Atlanta, GA.
- Fry, M. D., & Alexander, C.** (1996, June). *Children's understanding of task difficulty: A developmental analysis*. North American Society for the Psychology of Sport and Physical Activity, Cleveland's House, Canada.
- Duda, J. L., & Walling, M. D.** (1995, October). *Views about the Motivational climate and their self perceptions/affective correlates: The case for young elite female gymnasts*. Association for the Advancement of Applied Sport Psychology, New Orleans, LA.
- Newton, M. L., & Walling, M. D.** (1995, October). Goal orientations and beliefs about the causes of success among senior Olympic games participants. North American Society for the Psychology of Sport and Physical Activity, Asilomar, CA.
- Walling, M. D.** (1994, October). *Developmental differences in children's views regarding physical competence*. Association for the Advancement of Applied Sport Psychology, Lake Tahoe, NV.
- Walling, M. D., & Duda, J. L.** (1994, June). *Children's understanding of effort and ability in the physical domain*. North American Society for the Psychology of Sport and Physical Activity, Clearwater Beach, FL.
- Walling, M. D., Duda, J. L., Newton, M., & White, S.** (1993, October). *The Task and Ego Orientation in Sport Questionnaire: Further analysis with youth sport participants*. Association for the Advancement of Applied Sport Psychology, Montreal, CANADA.
- Walling, M. D., & Duda, J. L.** (1993, March). *Goals and their associations with beliefs about success in and perceptions of the purpose of physical education*. American Alliance for Health, Physical Education, Recreation, and Dance, Washington, DC.
- Walling, M. D.** (1993, February). *Children's conceptions of effort and ability in the physical domain: A dissertation in progress*. Midwest Sport Psychology Symposium, Miami University, Oxford, OH.
- Walling, M. D., Duda, J. L., & Crawford, T.** (1992, October). *The relationship between goal orientations and positive attitudes toward sport and exercise among young athletes*. Association for the Advancement of Applied Sport Psychology, Colorado Springs, CO.
- Walling, M. D., Duda, J. L., & Crawford, T.** (1992, June). *The psychometric properties of the perceived motivational climate in sport questionnaire: Further investigation*. North American Society for the Psychology of Sport and Physical Activity, Pittsburgh, PA.
- Walling, M. D., Crawford, T., Duda, J. L., & Wigglesworth, J.** (1992, April). *Are we having fun yet and will we want to play again?: The interrelationships between goal perspectives and other motivational variables in youth sport athletes*. American Alliance for Health, Physical Education, Recreation, and Dance, Indianapolis, IN.
- Walling, M. D., & Catley, D.** (1992, April). *Jack and Jill in physical education class: Do they*

think their instructor treats them differently? American Alliance for Health, Physical Education, Recreation, and Dance, Indianapolis, IN.

- Walling, M. D., & Catley, D.** (1992, February). *Sex role stereotyping among college instructors and students' perceptions of instructor gender bias*. Midwest Sport Psychology Symposium, Purdue University, West Lafayette, IN.
- Walling, M. D., Catley, D., & Taylor, A.** (1991, June). *The interrelationships between goal perspectives, perceived competence, and indices of intrinsic motivation*. North American Society for the Psychology of Sport and Physical Activity, Asilomar, CA.
- Walling, M. D.** (1991, April). *Learned helplessness: A case study of a sixth-grade physical education student*. American Alliance for Health, Physical Education, Recreation and Dance, San Francisco, CA.

Webinar

- Fry, M. D., & Hogue, C. M. (2019). *Theories and Models in Sport Psychology: A Review*. Association for the Advancement of Applied Sport Psychology.

State/Regional Presentations

- Gray, R., & Fry, M. D. (2020). *Employing a buddy system to foster physical activity among college students with a physical disability*. Midwest Sport Psychology Symposium, Illinois State University.
- Wineinger, T., & Fry, M. D. (2020). A collaboration between a sport psychology lab with a youth sport organization: Helping WIN create an optimal sport experience. Midwest Sport Psychology Symposium, Illinois State University.
- Fry, M. D.** (2018). *Three ideas for incorporating sport psychology into practice and competition*. Greenbush Coaches' Workshop.
- Fry, M. D.** (2018). *Three more ideas for incorporating sport psychology into practice and competition*. Greenbush Coaches' Workshop.
- Fry, M. D.** (2017). *Sport Psychology: Setting a Positive Tone for the Team* (Sessions A & B, repeated). Greenbush Fall Coaches' Workshop.
- Fry, M. D.** (2016). *KU Graduate Programs in Health, Sport & Exercise Science*. Morehouse College Graduate Program Fair (February, 2016).
- Fry, M. D.** (2016, Fall). *Keys to Helping Athletes Develop Strong Mental Skills: The Role of Sport Psychology*. Keynote for Greenbush Coaching Conference, Eudora, KS.
- Fry, M. D.** (2016, Spring). *Working with and bringing out the best in difficult athletes*. Greenbush Coaching Conference, Eudora, KS.
- Fry, M. D.** (2015). *Bringing out the Best in Every Swimmer: The Contribution of Sport Psychology*. Keynote delivered to US Master Swim at their National Conference; Kansas City, KS.
- Fry, M. D.** (2015). *Caring Climates for Physical Activity Settings*. University of Milwaukee, Wisconsin.
- Fry, M. D.** (2015). *Creating a Caring Climate to Maximize Athletes' Potential On and Off the Field*. Keynote presented at the Positive Coaching Alliance Trainers' Institute.
- Fry, M. D.** (2015). *Maximizing Athletes' Potential On and Off the Field*. Keynote delivered to X's and O's Coaching Education Workshop, Emporia State University, Emporia, KS.
- Fry, M. D.** (2015). *Setting the Stage for Coaches to Optimize Athletes' Motivation*. Big XII invited lecture at Texas Christian University; Fort Worth, TX.

- Fry, M. D.,** Moore, E., W., G., Iwasaki, S., Fontana, M., Hogue, C., Claunch, J., & McGhee, R. (2012). *Building Mentally Strong Athletes: Ideas for Incorporating Mental Skills Training with Sport Teams*. Kansas Alliance for Health, Physical Education, Recreation, & Dance in Lawrence, KS.
- Fry, M. D.** (2012). *Strong Girls: Hearing About the Benefits of a Physical Activity/Positive Life Skills Program from the Leaders and Kids*. Kansas Alliance for Health, Physical Education, Recreation, & Dance in Lawrence, KS.
- Moore, E. W., & **Fry, M. D.** (2010). *Kids don't care what you know until they know that you care: Tips for building caring environments*. Kansas Alliance for Health, Physical Education, Recreation & Dance, Wichita, KS.
- Brown, T., **Fry, M. D.**, & Hogue, C. (2010). *Positive life skills for every walk of life*. Kansas Alliance for Health, Physical Education, Recreation & Dance, Wichita, KS.
- Fry, M. D.**, Brown, T., Moore, E. W., Hogue, C., Sauer, S., & Beyer, J. (2010). *Team time: Team building activities for any group to use and process*. Kansas Alliance for Health, Physical Education, Recreation & Dance, Wichita, KS.
- Williamson, K., & **Fry, M. D.** (2009). *Bringing out the best in your athletes: Making sport fun again while enhancing your team's competitive edge*. Kansas Alliance for Health, Physical Education, Recreation & Dance, Pittsburg, KS.
- Moore, W. E., & **Fry, M. D.** (2009). *Are we building character or characters?: Strategies for promoting integrity among young athletes*. Kansas Alliance for Health, Physical Education, Recreation & Dance held in Pittsburg, KS.
- Brown, T. C., & **Fry, M. D.** (2009). *Ideas to implement in a youth physical activity life skills program*. Kansas Alliance for Health, Physical Education, Recreation and Dance held in Pittsburg, KS.
- Fry, M. D.**, Dodd, R., Brown, T. C. (2008). *Getting them interested and coming back: Creating a positive and caring environment in exercise settings*. Kansas Association of Health, Physical Education, Recreation and Dance, Emporia, KS.
- Fry, M. D.** (2005). *Creating a Positive Climate and Optimizing Motivation in Physical Education & on Sport Teams*. An invited presentation for the Lutheran Schools Midsouthern Regional Conference held in Memphis, TN.

SUPPORT

EXTERNAL FUNDING	AGENCY/SOURCE	AMOUNT	PERIOD
Creating Optimal Climate for Youth With Congenital Heart Disease	American Council on Exercise	\$2400	2021-2022
Climate Free Throw Intervention	Association for Applied Sport Psychology	\$4980	2021-2022
Strong Girls	Association for Applied Sport Psychology	\$4625	2019-2020
Rock Chalk, Zuni	Running Strong for American Indian Youth	\$5000	2017-2018
KU PCA Initiative	Positive Coaching Alliance/	\$75,000	2017-2020

David and Margaret Shirk Physical Education Programs Fund			
Strong Girls: A positive life skills intervention for 3 rd -5 th girls	Kohl's Cares for Kids	\$4000	2011
Students' salivary stress responses when juggling in two distinct motivational climates	Association of Applied Sport Psychology	\$2800	2010-11
Effects of resistance exercise and a Pre-workout dietary supplement on Physiological adaptations	Labrada	\$5000	2010
Strong Girls: A positive life skills physical activity intervention for elementary school girls	Association of Applied Sport Psychology	\$3220	2009-10
Fostering & maintaining motivation among urban youth tennis players	United States Tennis Association	\$10,000	1997-98
EXTERNAL PROPOSALS NOT FUNDED	AGENCY/SOURCE	AMOUNT	PERIOD
Children's International Guatemala & US Collaboration	ASportsUnited: International Sports Programming Initiative	\$224,953	2012
Dare to Care: Tackling Childhood Obesity	Albert Foundation	\$46,000	2013
Strong Girls: A positive life skills/physical activity program	Live-Well Lawrence-Kansas Health Foundation	\$5000	2011
Strong Girls: A positive life skills/physical activity program for girls	Payless Foundation	\$15,000	2011
Strong Girls: A positive life skills/Physical activity program for children	Sprint Foundation	\$168,000	2011
SUPPORT INTERNAL FUNDING	AGENCY/SOURCE	AMOUNT	PERIOD
Research Excellence Initiative" A Collaboration to Train Biology Lab Instructors to Create a Caring & Task Involving Climate	University of Kansas; College of Liberal Arts & Sciences	\$30,000	2019-2020 (under review)

Strong Girls: A community life skills/physical activity research and service project for elementary girls in Lawrence.	University of Kansas KU SOE Academic Year Research Support	\$8000	2011
Examining the motivational climate in a national fitness company.	University of Kansas Faculty Research Grant	\$5000	2010
Strong Girls: A physical activity and life skills intervention for faculty adolescent girls.	University of Kansas Research Grant	\$6000	2009
A team building/mental skills intervention for children enrolled in a summer camp.	University of Kansas New Faculty Research Grant	\$8000	2008
The relationship between young athletes' perceptions of a caring climate on their sport teams to their motivational responses	University of Memphis Faculty Research Grant	\$6000	2005
Effect of a strength training intervention for underserved elementary students	University of Memphis Faculty Research Grant	\$4000	2000-02
An examination of black females' perceptions of physical activity	Center for Research on Educational Policy, University of Memphis	\$5000	2000
Children's perceptions of ability and their motivational responses in physical education class.	Center for Research on Educational Policy, University of Memphis	\$3800	1999
The motivational implications of students' understanding of effort and ability in the physical domain.	University of Memphis Faculty Research Grant	\$4000	1995
Children's understanding of luck and ability, and task difficulty.	University of Memphis Faculty Research Grant	\$3000	1994
Developmental differences in children's conceptions of ability, effort, and task difficulty in the physical domain.	Purdue Foundation Grant	\$9,900 (per year for 2 years)	1992-94

Memberships in Professional Organizations

American Psychological Association (2017-present)
 American Alliance for Health, Physical Education, Recreation, and Dance (1988-2017).
 Association for Applied Sport Psychology, Member (1991-present).
 Kansas Alliance for Health, Physical Education, Recreation, & Dance (2008-present).
 North American Society for the Psychology of Sport and Physical Activity, Member (1988-2000).
 Indiana Association for Health, Physical Education, Recreation, and Dance, Member (1993-1994).
 Tennessee Association for Health, Physical Education, Recreation, and Dance, Member (1994-2000).

Teaching Responsibilities:**Undergraduate**

EXSS 3307 Psychosocial Aspects of Sport [UMemphis]
 EXSS 3450 Psychological Aspects of Exercise [UMemphis]*
 EXSS 4605 Internship in Exercise & Sport Science [UMemphis]
 EXSS 4999 Senior Project in Health, Physical Education, & Recreation [UMemphis]*
 HSES 385 Psychological Aspects of Exercise [KansasU]*
 HSES 440 Applied Sport Psychology [KansasU]*

Graduate

EXSS 7173 Sport and Exercise Psychology [UMemphis]*
 EXSS 6903 Developmental Perspectives in Youth Sport [UMemphis]*
 EXSS 7133 Current Readings: Motivation in Physical Activity Settings [UMemphis]*
 EXSS 7907 Special Topics: Applied Sport Psychology [UMemphis]*
 HSES 798 Special Course: Creating a Positive Environment in Physical Activity Settings [KansasU]*
 HSES 798 Special Course: Sport Psychology Within Youth Sport [KansasU]*
 HSES 798 Special Course: Advanced Sport Psychology [KansasU]**
 HSES 804 Sport Psychology [KansasU]**
 HSES 806 Stress Management [KansasU]*
 HSES 823 Behavior Modification [KansasU]
 HSES 892 Psychological Foundations of Sport and Physical Activity [KansasU] *
 HSES 982 Research Ethics [KansasU]

*Courses I developed.

Community Presentations

Fry, M. D. (November, 2017). *Lead campus participation in celebration of World Kindness Day.*

Fry, M. D. (June, 2016). *Mental Skills: A Key Ingredient for Excellence in Cross Country.* Workshop for Eudora High School Cross Country Team; Eudora, KS.

Fry, M. D. (2016). *Creating a Caring and Task-Involving Climate in CI's Game On Program.* A presentation for CI Employees at the International Headquarters Office in Kansas City, KS.

Fry, M. D. (2016). *Team Building: The Potential for Children International.* Workshop for Children International Employees at the National Headquarters office in

- Kansas City, KS.
- Fry, M. D.** (2015). *Activities and Strategies to Help Children and Adolescents Thrive in Physical Activity Settings*. Topeka Parks and Recreation Conference; Topeka, KS.
- Fry, M. D.** (2015). *Fostering Wellness at the Worksites*. Live Well Lawrence; Lawrence, KS.
- Fry, M. D.** (2011, Nov.). Guest panelist for KU Alternative Breaks, University of KS
- Fry, M. D.** (2011, Nov.). Guest speaker for Multicultural Education, University of KS.
- Fry, M. D.** (2011, Nov.). Guest speaker for Coaching Football Class, University of KS.
- Fry, M. D.** (2011, Oct.). Guest speaker for KU Bowling Team, University of KS.
- Fry, M. D.** (2011, April). Guest speaker for Positive Psychology Class, University of KS.
- Fry, M. D.** (2011, March). Guest speaker for Coaching Softball Class, University of KS.
- Fry, M.D.** (2011, Feb.). Guest speaker for Coaches Meeting for Sunflower Soccer Association, Topeka, KS.
- Fry, M. D.** (2010). Guest speaker for Healthy Musicians Class (2-hour workshop), University of KS.
- Fry, M. D.** (2009). Guest speaker for Life Skills Class at Atchison Community High School, KS.
- Fry, M. D.** (2005, Feb.). Caring communities within physical activity settings. An invited presentation to a Memphis Chapter of the Philanthropic Educational Organization.
- Fry, M. D.** (2001-present). Coordinate mental skills and physical activities for youngsters (i.e., cancer patients & their siblings) at Target House in Memphis, TN. Have conducted approximately 12 1.5-2 hour sessions.
- Fry, M. D.** (2002, July 17th). The role of sport psychology in the prevention of and rehabilitation after injury. A presentation for coaches attending the Memphis Interscholastic Athletic Association Conference.
- Fry, M. D.** (May, 2002). Presented stress management session for Cancer Support Group at Pentecostal Church in Memphis, TN.
- Fry, M. D.** (2001-present). Coordinate mental skills and physical activities for youngsters (i.e., cancer patients & their siblings).
- Fry, M. D.** (2000 & 2001, March-April). Coordinator for Short Putts to Spring Workshops for the MidSouth Junior Golf Association. Presenter for 2 of the 5 workshops on team building skills.
- Fry, M. D.** (1996). Optimizing arousal levels in tennis. A presentation to the Women's tennis team at The University of Memphis.
- Fry, M. D.** (1995, October). *Mental skills training in track and field*. A presentation to the Women's track and cross country teams at The University of Memphis.
- Walling, M. D.** (1995, February). *Maximizing your children's motivation in swimming: An educational sport psychology perspective*. A presentation to the Booster Club parents of the University of Memphis Swim Club.
- Walling, M. D.** (1995, February). *Fostering effort and enjoyment with your tennis players: A sport psychology perspective*. An invited talk which was part of a workshop sponsored by the USTA, the National Umpires Association and the Memphis City Schools for high school tennis coaches.
- Walling, M. D.** (1994). *Sport psychology with a developmental twist*. An invited presentation to the Sport Psychology Colloquium, Department of Psychology, University of Memphis.
- Walling, M. D.** (1993, October). *The influence of parents on young gymnasts' levels of stress and motivation*. An invited presentation sponsored by the United States Gymnastics Federation, Indianapolis, IN.

Walling, M. D.(1992, October). *The mechanics of sport psychology: What we do and how it impacts you and your family.* Presentation to the Purdue Mechanical Engineering Advisory Board Spouses.

Walling, M. D. (1991, July). *Stress Management.* Invited presentation sponsored by the National Institute for Fitness and Sport.

Walling, M. D., & Newton, M. (1991, October). *Sport Psychology for the Weekend Athlete.* Invited presentation sponsored by the Eli Lilly Corporation, Indianapolis, IN.

Departmental/University Service

KU Faculty Research Grant Review Committee (2021-2023)

Wolfe Teaching Award, School of Education (2021)

KU Title IX Committee (2020)

Kansas Women's Leadership Institute, Net-Walk Mentor Participant (2016-2017).

KU Certificate in Sport Committee (2017-2018).

KU Center for Undergraduate Research, Advisory Board (2016-2018).

KU Calendar Committee (2016-2018; Chair, 2017-2019).

SOE Scholarship & Awards Committee (2013-2019).

SOE Convocation Volunteer (2009-present).

HSES Faculty Search Committees (2009, 2010, 2012, 2013, 2014, 2015).

HSES Scholarship & Awards Committee (2010-2013), University of Kansas.

HSES Personnel Committee (2011-present), University of Kansas.

HSES Graduate Curriculum Committee (2008-2014), University of Kansas.

SOE Diversity Committee (2013-2016), University of Kansas.

SOE Technology Committee (2011-2013), University of Kansas.

SOE Governance Committee (2011-2013), University of Kansas.

SOE Personnel Committee (2007-2010), University of Kansas.

University of Kansas, Dean of the School of Education 5-year Review Committee (2014).

President's Tenure & Promotions Appeal Committee. (2007-2009). The University of Memphis.

HSS Community Affairs Committee (2004-2006). The University of Memphis.

Coordinator of Achievement Motivation Seminar (2003). The University of Memphis, Dept. HMSE.

PETE Unit Head, Dept. of HMSE, University of Memphis (2001-2003).

HMSE Tenure and Promotion Committee (1999-2000; Chair 2000-2001), The University of Memphis.

HMSE Coordinator for the Science Olympiad sponsored by The University of Memphis for high school honor science students in the Western portion of TN (1995-1999).

Dean's Council for Teacher Education (1994-1995), University of Memphis.

HMSE Material Resources Committee (1994-1995; 1998-2000, 2002; 2000-2001, Chair), University of Memphis.

HMSE Ad Hoc Committee on Internships (1994-1995), University of Memphis.

HMSE Recruitment Committee (1995-1996).

HMSE Physical Education Teacher Education Unit (1994-present; Unit Head-2001-2002), University of Memphis.

HMSE Ad Hoc Committee on Proposing a PhD Program (1995-1997).

HMSE Undergraduate Council (1994-95 & 1997-1998)

HMSE Academic Council (1996-1998).

HMSE Graduate Studies and Research Council (1995-2001; chair from 1996-1998)

College of Education Graduate Council (1996-1998).

Graduate Coordinator for the Department of Human Movement Sciences and Education, (1996-1998).

Service to National Organizations

Creating a Caring Climate Within and Across an Athletic Program, Positive Coaching Alliance Workshop (2020).

Subject Matter Expert for the Certification Exam Committee, Association of Applied Sport Psychology (2018).

Member of Ad-Hoc Committee to Study Future of AASP, Association of Applied Sport Psychology (2012-2015).

Member of the Social Psychology Section Committee, Association for the Advancement of Applied Sport Psychology (AAASP). Appointed for a 3-year-term, 1996-99; 2001-2003.

Member of AAASP Dissertation Award Committee (1998 & 2002).

Member of Editorial Board for *Physical Activity Today* (American Alliance for Health, Physical Education, Recreation and Dance publication), 1997-2001.

Member of Sport Psychology Program Area Review Committee for the 1996 Annual Meeting of the North American Society for the Psychology of Sport and Physical Activity (NASPSPA).

Executive Board Member, Association for the Advancement of Applied Sport Psychology, (2004-2006).

Member of Program Review Committee, American Alliance of Health, Physical Education, Recreation & Dance (2009- 2017); Chaired committee in 2010.

Member of Program Review Committee, Association for Applied Sport Psychology (2008-present).

Reviewing/Editing Responsibilities

Associate Editor (2009-2012); Editorial Board Member (2000-2009; 2013-present) and Reviewer (1992-1999). *Journal of Applied Sport Psychology*.

Associate Editor. *Sport Psychology in Action* (2008-present).

Editorial Board Member. *Sport, Exercise, and Performance Psychology* (2011-present; American Psychological Association Journal).

Sport & Exercise Psychology Section Editor (2003-2006) and Reviewer (1994-present). *Research Quarterly for Exercise and Sport*.

Co-editor with David R. Black of Abstracts Column. *Peer Facilitator Quarterly* (1993-1994).

Reviewer. *Education and Treatment of Children* (1993-1995).

Reviewer. *Journal of Health Education* (1993-1995).

Reviewer. *The Sports Psychologist* (1997-present).

Reviewer. *International Journal of Sport Psychology*. (1997-present).

Reviewer. *Journal of Sport and Exercise Psychology* (1993-present).

Reviewer. *Journal of Strength and Conditioning* (1998-present).

Reviewer & Editorial Board Member. *Journal of Strength and Conditioning Research* (Reviewer, 1996-present; Editorial Board Member, 1996-1998).

Contributor to Community/National Forum

- Fry, M. D., & Brown, T. C.** (2021-present). Co-Directors of Strong Girls, an after-school physical activity and lifeskill program for adolescent girls. University of Kansas.
- Fry, M. D.** (Fall, 2017). *Participating in a Positive Sport Climate Reaps Many Benefits for Young People*. Column written for the National Dropout Prevention Coalition-Newsletter.
- Fry, M. D.** (2017). *The Power of the Positive*. Contributor to the Positive Coaching Alliance Video.
- DeAngelis, T. (2016) *Psychologists' research points ways to keep youth athletes in sports*. American Psychological Association Monitor Newsletter [KU Sport & Exercise Psychology Lab featured]
- Fry, M.D.** (2003). *Coaches' rant can bench kids for life*. Invited guest column in the Viewpoint Section of the Commercial Appeal, April 7, 2003.
- Fry, M.D.** (2003, March). *Strategies for creating a task-involving climate with underserved youth*. An invited presentation to the Dept. of EXSS at the University of Mississippi.
- Fry, M.D.** (2002). Presenter of workshop entitled: *The Climate Counts: Techniques and Strategies for Fostering a Task-Involving Motivational Climate*.
- Fry, M. D., & Newton, M. L.** (1997, December). *TARGETing success in volleyball: Creating a positive motivational climate*. Invited speaker at the American Volleyball Coaches Association (AVCA) National Convention preceding the NCAA Final Four Tournament in Spokane, WA.
- Fry, M. D.** (1996, April). Invited speaker at Colonial Junior High's Career Day.
- Fry, M. D.** (February, 1995 & October, 1996). Invited guest on Eddie Cantler's talk-show, "The Trainer's Corner" seen on the Library Channel, Memphis, TN.
- Walling, M. D.** (1995). Choosing quality youth sport programs for children: The critical role of parents. *Journal of Kinetic Arts, 1* (5).

Applied Sport Psychology Experiences

- Fry, M. D. (2008-present). Mental Skills Interventions with high school & university athletes.
- Fry, M. D. (2013-2018). Mental Skills Intervention with a high school baseball team.
- Fry, M. D. (2009-2011). Mental Skills Intervention with a youth baseball team.
- Fry, M. D. (2008-2010). Mental Skills Intervention with a Division 1 collegiate volleyball team.
- Fry, M.D. (2006-2007). Mental Skills Intervention with a high school basketball team.
- Fry, M. D. (2006). Mental Skills Intervention with a Division 1 cross country team.
- Fry, M.D. (2005-2006). Mental Skills activities with a high school golfer.
- Fry, M.D. (2003). Mental Skills Activities provided to the Dolphins, a youth synchronized swim program in Memphis.
- Fry, M.D. (2001-2007). Mental Skills Games and Activities Sessions provided to residents of Target House (i.e., long-term treatment patients at St. Jude Hospital).
- Fry, M. D. (2001, Spring). The Strength Club. An after-school mental skills training program for elementary-aged children.
- Fry, M. D. (1996, Spring). Consultation with members of a Division 1 collegiate Track and Field Team.

Walling, M. D. (1994, December). Member of Sport Psychology Coaching Staff for the Talent Opportunity Program (TOP) Camp sponsored by the United States Gymnastics Federation (USGF). Tulsa, OK

Walling, M. D. (1992, October). *Effective Goal Setting in Volleyball*. Presentation to the West Lafayette High School Volleyball Team.

Walling, M. D. (1992, April). *Stress Management in Sport*. Presentation to the Women's Crew Team, Purdue University.

Walling, M. D. (1992). Consultation with High School Tennis Player Over a Season.

Chair, Graduate Student Advisory Council, Department of Health, Kinesiology, and Leisure Studies at Purdue University, 1991-1992.

Exhibit 28

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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA

* * * * *

B.P.J., by her next friend and
mother, HEATHER JACKSON,
Plaintiffs
vs.
WEST VIRGINIA STATE BOARD OF
EDUCATION, HARRISON COUNTY BOARD OF
EDUCATION, WEST VIRGINIA SECONDARY
SCHOOL ACTIVITIES COMMISSION, W.
CLAYTON BURCH in his official
capacity as State Superintendent,
and DORA STUTLER in her official
capacity as Harrison County
Superintendent, PATRICK MORRISEY in*

*
*
* Case No.
* 2:21-CV-00316

VIDEOTAPED DEPOSITION OF
MARY D. FRY, PH.D.
March 29, 2022

Any reproduction of this transcript
is prohibited without authorization
by the certifying agency.

1 his official capacity as Attorney *
2 General, and THE STATE OF WEST *
3 VIRGINIA, *
4 Defendants *

5 * * * * *

6
7 VIDEOTAPED DEPOSITION OF
8 MARY D. FRY, PH.D.
9 March 29, 2022

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VIDEOTAPED DEPOSITION
OF
MARY D. FRY, PH.D. taken on behalf of the Intervenor
herein, pursuant to the Rules of Civil Procedure, taken
before me, the undersigned, Nicole Montagano, a Court
Reporter and Notary Public in and for the Commonwealth
of Pennsylvania, taken via videoconference, on Tuesday,
March 29, 2022 at 10:03 a.m.

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A P P E A R A N C E S

KATHLEEN R. HARTNETT, ESQUIRE

JULIE VEROFF, ESQUIRE

ZOE HELSTROM, ESQUIRE

KATELYN KANG, ESQUIRE

ELIZABETH REINHARDT, ESQUIRE

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New York, NY 10005-3919

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A P P E A R A N C E S (cont'd)

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State Capitol Complex
Building 1, Room E-26
Charleston, WV 25305

COUNSEL FOR STATE OF WEST VIRGINIA

ROBERTA F. GREEN, ESQUIRE
Shuman McCuskey Slicer, PLLC
1411 Virginia Street East
Suite 200
Charleston, WV 25301

COUNSEL FOR WEST VIRGINIA SECONDARY SCHOOL
ACTIVITIES COMMISSION

JEFFREY M. CROPP, ESQUIRE
Steptoe & Johnson
400 White Oaks Boulevard
Bridgeport, WV 26330

COUNSEL FOR HARRISON COUNTY BOARD OF EDUCATION and
HARRISON COUNTY SUPERINTENDENT DORA STUTLER

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A P P E A R A N C E S (cont'd)

KELLY C. MORGAN, ESQUIRE

Bailey Wyant

500 Virginia Street East

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Charleston, WV 25301

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SUPERINTENDANT W. CLAYTON BURCH

JOHNATHAN SCRUGGS, ESQUIRE

RACHEL CSUTOROS, ESQUIRE

Alliance Defending Freedom

15100 North 90th Street

Scottsdale, AZ 85260

COUNSEL FOR INTERVENOR, LAINEY ARMISTEAD

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I N D E X

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S T I P U L A T I O N

(It is hereby stipulated and agreed by and between
counsel for the respective parties that reading,
signing, sealing, certification and filing are not not
waived.)

P R O C E E D I N G S

MARY D. FRY, PH.D.,

CALLED AS A WITNESS IN THE FOLLOWING PROCEEDING, AND
HAVING FIRST BEEN DULY SWORN, TESTIFIED AND SAID AS
FOLLOWS:

MS. BURKDOLL: My name is Dana Burkdoll,
CSR, Notary for the State of Kansas.

ATTORNEY TRYON: We might want to go off
the record.

VIDEOGRAPHER: Going off the record.

Current time reads 10:03 a.m.

OFF VIDEOTAPE

(WHEREUPON, AN OFF RECORD DISCUSSION WAS HELD.)

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ON VIDEOTAPE

VIDEOGRAPHER: We are now back on the record my name is Jacob Stock. I'm a Certified Legal Video Specialist employed by Sargent's Court Reporting Services. The date today is March 29th, 2022. The current time reads 10:05 a.m. Eastern Standard Time. This deposition is being taken remotely by a Zoom conference. The caption of this case is in the United States District Court for the Southern District of West Virginia, Charleston Division. BPJ, et al. versus the West Virginia Board of Education, et al. Civil Action Number 2:21-CV-00316. The name of the witness is Mary Fry, who has already been sworn in. Will the attorneys present state their names and the parties they represent?

ATTORNEY TRYON: This is David Tryon representing the State of West Virginia and I'm with the Attorney General's Office.

ATTORNEY VEROFF: Julie Veroff with Cooley, LLP. I represent the Plaintiff. And I'll let my co-counsel introduce themselves.

ATTORNEY HARTNETT: Hi. This is Kathleen Hartnett from Cooley. I'm in the room with Julie,

1 representing Plaintiff.

2 ATTORNEY KANG: Hi. This is Katelyn
3 Kang representing Plaintiffs.

4 ATTORNEY REINHARDT: This is Elizabeth
5 Reinhardt with Cooley, also for Plaintiffs.

6 ATTORNEY HELSTROM: Zoe Helstrom, with
7 Cooley, also for Plaintiffs.

8 ATTORNEY SWAMINATHAN: This is Sruti
9 Swaminathan from Lambda Legal also for Plaintiff.

10 ATTORNEY SCRUGGS: Johnathan Scruggs with
11 Alliance for Freedom for the intervening Defendants.
12 And also with me on the Zoom is Rachel Csutoros, also
13 for the intervening Defendant.

14 ATTORNEY CROPP: This is Jeffery Cropp
15 from Steptoe & Johnson representing the Defendants
16 Harrison County Board of Education and Superintendent
17 Dora Stutler.

18 ATTORNEY GREEN: This is Roberta Green
19 here on behalf of West Virginia Secondary School
20 Activities Commission.

21 VIDEOGRAPHER: And if that is everyone we
22 can begin.

23 ATTORNEY TRYON: Is Kelly on the line?
24 Did I miss that?

1 ATTORNEY VEROFF: Yes, thank you so much.

2 ATTORNEY TRYON: Does anybody else have
3 any objection to doing it that way? Okay. Then let's
4 move forward.

5 ---

6 EXAMINATION

7 ---

8 BY ATTORNEY TRYON:

9 Q. Hello, Professor Fry. How are you?

10 A. Doing well. Thank you.

11 Q. Do you prefer calling you Professor Green ---
12 excuse me Professor Fry? Does that work?

13 A. Sure.

14 Q. Okay.

15 Can you state your full name for the record
16 please?

17 A. Mary Diane Fry.

18 Q. Are you represented by counsel this morning?

19 A. Yes.

20 Q. And who is your --- primarily representing you
21 today?

22 A. Julie, Julie Veroff.

23 Q. Great. And have you been deposed before?

24 A. I have not.

1 Q. Have you testified in court before?

2 A. One time.

3 Q. Tell me about that.

4 A. Years ago my husband and I returned from our
5 honeymoon and we found out we had been robbed. And a
6 neighbor had seen three guys crawling out of our bedroom
7 window, and so I appeared in court to share what was
8 missing when we returned.

9 Q. Well, I'm sorry. That doesn't sound like a
10 great way to end a honeymoon. So any other times you
11 testified at trial?

12 A. No.

13 Q. And when we're speaking, you know, since we're
14 in a deposition, this is a communication privilege
15 unlike any other, but one of the things that we need to
16 make to make it easier for the court reporter to
17 understand what we're doing. So when I ask you a
18 question please make sure you answer verbally as opposed
19 to just nodding your head.

20 Okay?

21 A. Okay.

22 Q. If you don't understand a question that I ask
23 you, tell me and I'll try and rephrase.

24 All right?

1 A. Sounds good.

2 Q. And if you answer I'll have to assume that you
3 understood the question. Do you understand that?

4 A. Yes.

5 Q. And as we stated off the record, if you need a
6 break at any time, let us know. We will break for you
7 and the only caveat on that is once I ask a question you
8 have to wait until you finish your answer before we can
9 take a break.

10 All right?

11 A. Okay. Thank you.

12 Q. Do you have any questions about this proceeding
13 before we get started?

14 A. No.

15 Q. Okay.

16 Well, just for the record, this deposition is
17 being conducted as on Cross Examination. And Professor
18 Fry, did you bring any documents to the deposition
19 today?

20 A. Yes.

21 Q. What did you bring?

22 A. I have before me my Declaration, the House Bill,
23 my expert report and my Vitae.

24 Q. And when you talk --- mention your Declaration,

1 is this the first one that was filed in the case? Is
2 that what you mean?

3 A. Yes.

4 Q. Is there anyone else in the room with you at
5 this point?

6 A. No.

7 Q. What documents did you review in preparation for
8 your deposition today?

9 A. I reviewed my statement and my Vitae and some of
10 the Court documents, the Complaint and a cursory review
11 of some of the other statements. I reviewed the
12 Plaintiff's statement and her mother's statement.

13 Q. Any other Court documents besides the Complaint
14 and the statement with the Plaintiff and the mother?

15 A. A cursory review of other expert witnesses and,
16 yeah, any of the case documents, a cursory review.

17 Q. Which expert reports did you look at?

18 A. I couldn't call them all by name but the expert
19 witnesses that are medical experts.

20 Q. The Plaintiff's experts or Defendants' or both?

21 A. Both.

22 Q. So there is a total of, now including yours,
23 eight expert reports. Have you seen all of those?

24 A. You know, I'm not positive. There was a report

1 from two on each side and then a response, and so I ---
2 and again I didn't read these in detail, but I did have
3 a look at them.

4 Q. Okay.

5 Was there anything in particular that you were
6 looking for when you looked through those expert
7 reports?

8 A. No, just trying to get a sense of the case. I
9 kept a focus on my purpose here today.

10 Q. And so are you aware of this case? Do you know
11 who BPJ is?

12 A. Yes.

13 Q. And who is BPJ?

14 A. She is a young athlete in West Virginia who is a
15 transathlete and wanted to play sports in her school.

16 Q. And you understand BPJ is the Plaintiff.

17 Is that right?

18 A. Yes.

19 Q. Do you know who Heather Jackson is?

20 A. Her mother.

21 Q. Have you ever spoken to either one of them?

22 A. I have not.

23 Q. So I presume by the same rationale you have not
24 met either one of them either.

1 Correct?

2 A. I have not.

3 Q. When did you first hear about BPJ?

4 A. About a year ago I was contacted by Plaintiff's
5 Counsel in late April.

6 Q. And of course, don't tell me anything that your
7 counsel --- any discussions you had after you were
8 retained by counsel, but prior to being retained by
9 counsel --- well, let me back up.

10 At one point you were retained by counsel to be
11 an expert in this case.

12 Right?

13 A. Right.

14 Q. When was that?

15 A. Late April, early May, I believe.

16 Q. And what were you first told about the case
17 before you were retained?

18 A. That this case involved a young athlete who was
19 headed to Middle School and really wanted to be able to
20 play sports.

21 Q. Were you told which sport?

22 A. I think so at the time.

23 Q. So at this point in time do you know which
24 sports BPJ wanted to participate in at the time that BPJ

1 filed the lawsuit?

2 A. You know, it's hard to recall. There's quite a
3 bit of water under the bridge. I know now that she
4 wanted to do cheerleading and run track, and I'm not
5 sure I could tell you the exact date I knew either one
6 of those.

7 Q. Okay.

8 Let me rephrase my question because I'm not
9 asking what the date was, I'm asking if you now know
10 what --- at this time what sport BPJ participated in?

11 A. Yes.

12 Q. And which one?

13 A. She participated in cheerleading and now track.

14 Q. And so it was cross-country is that the same
15 thing as track?

16 A. Sorry, cross-country. It's a different season,
17 cross-country.

18 Q. Is that part of track and field or is it
19 different?

20 A. It's a different season, yeah. I mean,
21 usually it's grouped together, track and cross-country,
22 but I should have said cross-country. That is what I
23 meant.

24 Q. Okay.

1 At the time that you were retained had you
2 already prepared any report similar to what was
3 ultimately filed in this case on your behalf?

4 A. Yes.

5 Q. So tell me about that.

6 A. Okay.

7 Q. So let me make sure we are communicating. So
8 before you were contacted by counsel for BPJ, had you
9 already prepared something that what was filed as your
10 Declaration?

11 A. Yes.

12 Q. Okay.

13 Tell me about that.

14 A. Okay.

15 In the spring of 2020 I was contacted to see if
16 I would be willing to be an expert witness first in the
17 Connecticut case, transathlete case and then in Idaho.
18 And those sort of overlapped in the spring of 2020 a
19 little bit, but I've been involved in providing expert
20 reports for both of those.

21 Q. Okay.

22 So you did serve as an expert witness in the
23 Connecticut case.

24 Is that right?

1 A. Yes.

2 Q. Was something that you prepared filed in the
3 Connecticut case?

4 A. Yes.

5 Q. Same thing in the Idaho case?

6 A. Yes.

7 Q. Have you served as an expert witness in any
8 other cases besides those two?

9 A. I'm serving as an expert witness in the Florida
10 case as well.

11 Q. But you, to date, have not testified in any of
12 those cases.

13 Right?

14 A. That's correct.

15 Q. And you haven't been deposed in those cases
16 either I take it.

17 Right?

18 A. That's right. I have not.

19 Q. Have you actually prepared an expert report for
20 Florida at this point?

21 A. Yes.

22 Q. Has that been submitted to court yet?

23 A. I believe so.

24 ATTORNEY TRYON: At this point your

1 initial report that was filed with the court, the
2 initial Declaration. Let's mark that as Exhibit-1 and I
3 will ask the court reporter to bring that up.

4 ---

5 (Whereupon, Exhibit 1, Declaration,
6 marked for identification.)

7 ---

8 BY ATTORNEY TRYON:

9 Q. And feel free to look at your hard copy as we
10 are discussing these exhibits, okay, Professor?

11 A. Okay.

12 ATTORNEY VEROFF: Sorry. I think this is
13 the expert report and I think you were asking for the
14 Declaration.

15 ATTORNEY TRYON: Yes, right.

16 VIDEOGRAPHER: My apologies.

17 ATTORNEY TRYON: It should have the Court
18 stamp on the left at the top as I recall.

19 VIDEOGRAPHER: I see that. My apologies.

20 BY ATTORNEY TRYON:

21 Q. So first of all, I want to establish that this
22 is the Declaration that you first prepared for this
23 case.

24 Is that right?

1 and ask if you recognize what they are and then maybe
2 during a break you can do that.

3 VIDEOGRAPHER: That works for me.

4 ATTORNEY TRYON: And for the record we
5 will be looking at the statute, which we will be marking
6 as Exhibit-3 to this deposition.

7 ---

8 (Whereupon, Exhibit 3, HB-3293, was
9 marked for identification.)

10 ---

11 BY ATTORNEY TRYON:

12 Q. So now let's go to Exhibit-2, which is your
13 current expert report. I'm going to try to manipulate
14 my page so I can see you, Professor, at the same time.
15 I can switch this over to another screen, but it's not
16 working. Let's try this. All right. So looking at
17 Number 4 --- let me back up, paragraph number three, you
18 say you have knowledge of the matters stated in this
19 expert report and Declaration. I have collected and
20 cite to relevant literature concerning the issues that
21 arise in this litigation. Do you see that?

22 A. Yes.

23 Q. So what are the issues that arise in this
24 litigation as you understand it?

1 ATTORNEY VEROFF: I'm sorry. I'll just
2 object to the extent that complete paragraph three
3 wasn't read.

4 ATTORNEY TRYON: Okay.

5 BY ATTORNEY TRYON:

6 Q. Okay.

7 Feel free to read the entire paragraph if you
8 want but I'm just asking about that specific clause.

9 A. The issues that are relevant are that there's a
10 categorical exclusion of transathletes. And that is of
11 concern because of the many benefits that athletes reap
12 from having the opportunity to participate in sports.

13 Q. Any other issues that arise in this litigation?

14 A. Nothing comes to mind at the moment.

15 Q. So that's what you refer to when you say issues
16 arise in this litigation, and you said the categorical
17 exclusion of transgender athletes because of benefits
18 athletes receive from sport. Is that about right? It's
19 not exactly what you said, but that is about right?

20 A. Yeah, because of the categorical exclusion of
21 transgender athletes in sports that prevent them from
22 having opportunities to reap all the benefits in sport.

23 Q. You have said already on the record and you also
24 say in paragraph four that in preparing this expert

1 report and Declaration I reviewed West Virginia HB-3293,
2 the bill at issue in this litigation.

3 Right?

4 A. Yes.

5 Q. So how --- did you read the entire thing?

6 A. The entire bill?

7 Q. That's my question.

8 A. Yes, yes.

9 Q. What did the legislature say the purpose is?

10 A. Well, to prevent transgender females from
11 participating in a sport in West Virginia.

12 Q. The bill does not use the word transgender at
13 all, does it?

14 ATTORNEY VEROFF: Sorry. Mr. Tryon, I'm
15 going to object. If you're going to ask the witness
16 about the bill, if you could please put it up on the
17 screen so she could have it in front of her.

18 ATTORNEY TRYON: We will do it in a
19 moment. I think she's looking at it anyway, so it's
20 been put up on the screen.

21 ATTORNEY VEROFF: Is that right,
22 Professor Fry? Do you have a hard copy of the bill in
23 front of you?

24 THE WITNESS: Yes.

1 So this has previously been marked but for this
2 deposition we will mark it as Exhibit-3.

3 BY ATTORNEY TRYON:

4 Q. So this is the House Bill that you --- the law
5 that you reviewed, Professor Fry?

6 A. Yes.

7 Q. Excuse me. And nowhere in here does it use the
8 word transgender, does it?

9 A. No.

10 ATTORNEY VEROFF: Objection.

11 BY ATTORNEY TRYON:

12 Q. Take a look at paragraph one --- excuse me,
13 page one, under 18-2-25(e), line 1A, it starts A,
14 legislature hereby finds there are inherent differences
15 between biological males and biological females and that
16 these differences are cause for celebration as
17 determined by the Supreme Court of the United States in
18 United States versus Virginia 1996, in parentheses. Do
19 you see that?

20 A. Yes.

21 Q. Do you agree with that statement?

22 ATTORNEY VEROFF: Objection.

23 BY ATTORNEY TRYON:

24 Q. Go ahead.

1 A. Yes.

2 Q. Number two in parentheses says, these inherent
3 differences are not a valid justification for sex-based
4 classifications that make overbroad generalizations or
5 perpetuate the legal, social and economic inferiority of
6 either sex. Rather these inherent differences are a
7 valid justification for sex-based classifications when
8 they realistically reflect the fact that the sexes are
9 not similarly situated in certain circumstances, as
10 recognized by the Supreme Court of the United States in
11 Michael V. Sonoma County Association of Intercollegiate
12 Athletics, and NIA in parentheses or National Junior
13 College Athletic Association. I goofed that. Sorry. I
14 skipped a page. So continuing it said in Michael M. v.
15 Sonoma County Superior Court 1981, in parentheses, and
16 Supreme Court of Appeals in West Virginia in Israel v.
17 Secondary Schools Commission in 1989 in parentheses.
18 Other than the citations of those cases do you agree
19 with that statement?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: I believe that it's more
22 complex than just to have a binary understanding of
23 males and females.

24 BY ATTORNEY TRYON:

1 Q. So let me restrict my question to this part. It
2 says these inherent differences are a valid
3 justification for sex-based classifications when they
4 realistically reflect the fact that sexes are not
5 similarly situated in certain circumstances. That
6 clause, do you agree with or disagree with?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: Yeah, I would just say that
9 it's all --- more complex than just saying that we have
10 males and females.

11 BY ATTORNEY TRYON:

12 Q. Okay.

13 I'm sorry, what did you say last?

14 A. Yeah, that it's more complex than just
15 considering them --- everyone fits tightly into a male
16 or female category.

17 Q. And so you would disagree with that statement?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: Yeah, I would agree with
20 the first sentence, that we shouldn't use these to
21 discriminate.

22 BY ATTORNEY TRYON:

23 Q. Does that specific clause, you don't agree with
24 that, is that a fair statement?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: The first sentence of number
3 two?

4 BY ATTORNEY TRYON:

5 Q. I'm sorry. Let me make sure we're clear on the
6 record. The phrase that says these inherent differences
7 are a valid justification for sex-based classifications
8 when they realistically reflect the fact that sexes are
9 not similarly situated in certain circumstances, that
10 clause, as I understand your testimony, you do not agree
11 with in its entirety. Is that true?

12 ATTORNEY VEROFF: Sorry, Mr. Tryon.
13 Objection.

14 THE WITNESS: Right, that's true.

15 BY ATTORNEY TRYON:

16 Q. Okay.

17 Number three, it says in the context of sports
18 involving competitive stellar contact --- actually,
19 strike that.

20 Let's move down. I want to make sure I
21 understand. These are using terms that are defined
22 below, so I want to see if we have a mutual agreement on
23 the meaning of these terms. And on line 25, as shown on
24 the left-hand side, it defines, quote, biological sex,

1 closed quote, means an individual's physical form as a
2 male or female based solely on the individual's
3 reproductive biology and genetics at birth. Do you see
4 that?

5 A. Yes, I see that.

6 Q. Is that a fair definition of biological sex?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: I disagree. I think it is
9 more complex than that.

10 BY ATTORNEY TRYON:

11 Q. Okay.

12 How would you define biological sex?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: Based on multiple factors
15 besides just the reproductive biology in genetics at
16 birth.

17 BY ATTORNEY TRYON:

18 Q. Okay.

19 And what would your definition be?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: I'm not sure.

22 BY ATTORNEY TRYON:

23 Q. Okay.

24 Well, the reason I ask is because we are

1 probably using these terms throughout this deposition
2 today, so I'm trying to make sure we have a mutual
3 understanding of what biological sex means. So I don't
4 want to try and impose upon you a definition that you
5 are uncomfortable with.

6 A. Okay.

7 Q. So if you could give me something that you would
8 be comfortable with, I would appreciate it.

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Yeah, I would feel more
11 comfortable --- yeah, I'm not sure, to be honest.

12 BY ATTORNEY TRYON:

13 Q. All right.

14 So I assume that the definition of female in
15 here you're also uncomfortable with. Is that a fair
16 statement?

17 A. Yes.

18 ATTORNEY VEROFF: Objection.

19 BY ATTORNEY TRYON:

20 Q. How about the definition of male, can we reach
21 an agreement that male means an individual whose
22 biological sex determined at birth is male?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Yes, I would not agree with

1 that.

2 BY ATTORNEY TRYON:

3 Q. You would not agree with that. Does the word
4 male have a meaning to you?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: Yes. I feel like it's
7 related to how people see themselves in terms of male or
8 female.

9 BY ATTORNEY TRYON:

10 Q. So it's only --- the term male only means how
11 somebody sees him or herself?

12 ATTORNEY VEROFF: Objection.

13 THE WITNESS: They view their identity as
14 male and female, I think that's the critical thing.

15 BY ATTORNEY TRYON:

16 Q. And does biology have any importance at all?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: Yes, it does. It's just not
19 the only factor.

20 BY ATTORNEY TRYON:

21 Q. So how about this, how about if we will refer to
22 male today, male or boy, we mean someone whose birth ---
23 on whose Birth Certificate it designates them as male or
24 as male?

1 ATTORNEY VEROFF: Objection.

2 BY ATTORNEY TRYON:

3 Q. Can we use that as a definition today?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: I think it's more
6 appropriate to use the term to refer to people who
7 identify as male.

8 BY ATTORNEY TRYON:

9 Q. So you don't think there is such a thing as a
10 biological male? Is that what you are telling me?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I think term biological
13 male is a complex term, that a lot goes into that.

14 BY ATTORNEY TRYON:

15 Q. You're familiar with the term cismale, right?

16 A. Yes.

17 Q. What does that mean?

18 A. Well, first is somebody whose identity aligns
19 with their birth characteristics.

20 Q. Okay.

21 What birth characteristics are those?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: I think the male, female
24 category works in general, but there is people who fall

1 in between and may not be from a biological perspective
2 nice and tightly categorized into either of those
3 categories. So when I say it is complex, it is is not
4 just the way somebody was born or one particular, you
5 know, physical characteristic or so.

6 BY ATTORNEY TRYON:

7 Q. Well, I'm just try to understand the term you
8 just gave me. You said that cisgender is someone that
9 identifies in the same --- identifies with the sex that
10 corresponds with their birth characteristics. And I'm
11 asking what you meant when you said birth
12 characteristics.

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: Yeah, I feel like there's
15 medical terms that go beyond my expertise. But in my
16 understanding, someone can be born and have
17 characteristics of cross gender. So using just a binary
18 system where we categorize and put everyone in either a
19 male or female category is limiting and not helpful.

20 BY ATTORNEY TRYON:

21 Q. So then what is a cisgender person?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: Someone who may align
24 physically at birth with one of the genders. And also

1 when I say align, those match up with how they perceive
2 themselves along with their birth characteristics.

3 BY ATTORNEY TRYON:

4 Q. Again you use that term birth characteristics.
5 I need to know what you mean by that.

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: Again, using this in --- in
8 --- from my perspective, I would listen to the doctors
9 who study this and say that we can't just classify
10 people tightly into these categories. And some people
11 may share characteristics of either gender at birth and
12 so it may be more complicated.

13 BY ATTORNEY TRYON:

14 Q. So we still don't even have a definition of
15 cisgender from you.

16 ATTORNEY VEROFF: Objection.

17 BY ATTORNEY TRYON:

18 Q. So you don't know what birth characteristics
19 are? Is that what you are telling me?

20 ATTORNEY VEROFF: Objection, asked and
21 answered?

22 THE WITNESS: Yeah, I think some people
23 are born and they fit nicely into these categories of
24 male and female. I'm just acknowledging that not

1 everyone does. And if they do fit nicely into those,
2 nicely just meaning that they are --- they, you know,
3 are considered male at birth and they also perceive that
4 they are than --- or the other way is female, then that
5 would be a cisgender person.

6 ATTORNEY TRYON: Jake, how do I get to
7 the live feed?

8 VIDEOGRAPHER: You mean like the video
9 feed or like the real time?

10 ATTORNEY TRYON: Yes.

11 VIDEOGRAPHER: Give me one sec, I'll
12 repost the link.

13 ATTORNEY TRYON: Are you going to put
14 that in the chat room?

15 VIDEOGRAPHER: It should be visible now.

16 BY ATTORNEY TRYON:

17 Q. When you --- you used the term now considered
18 male at birth. Can you tell me what you mean by that?

19 ATTORNEY VEROFF: Objection.

20 BY ATTORNEY TRYON:

21 Q. I'm not trying to trick you. I'm just trying to
22 establish some definition so we can communicate properly
23 today.

24 A. Yeah.

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: Yeah, I think a medical
3 professional says that a baby has all the
4 characteristics of a male, right. I'm just simply
5 saying that everyone doesn't fit nice and tightly into
6 that male or female, that there's two cross overs that
7 the doctors seem to agree on.

8 BY ATTORNEY TRYON:

9 Q. And what the doctors seem to agree on is what
10 they put on the Birth Certificate, right, at least
11 initially? Fair statement?

12 ATTORNEY VEROFF: Objection.

13 THE WITNESS: Yeah. I'd say in general
14 doctors choose one or the other that's closest.

15 BY ATTORNEY TRYON:

16 Q. So at least for purposes of today, when I say
17 male or boy can we agree that I'm referring to someone
18 who on the Birth Certificate, the original Birth
19 Certificate, it is stated that that person is male?

20 A. I can agree to proceed that way.

21 Q. Okay.

22 And the same thing with respect to female or
23 girl.

24 Right?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: Yes. Can we also agree
3 that if I -- that I can use the term transfemale to
4 refer to someone who may share characteristics across
5 gender and may identify as a female?

6 BY ATTORNEY TRYON:

7 Q. Let's be clear on that. Please tell me what
8 your definition of trans --- let's first cite what does
9 transgender mean?

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: Transgender refers to
12 someone who may have been classified as birth as one
13 gender but identifies as the other gender.

14 BY ATTORNEY TRYON:

15 Q. And then transgender girl, can you give me your
16 definition of that?

17 A. Yes, someone who may have been assigned the male
18 sex at birth and identifies as female.

19 Q. And then transgender boy?

20 A. Someone who may have been assigned female ---
21 assigned a female gender at birth but perceives ---
22 identifies with a male sex, male gender.

23 Q. Now, when I asked you about transgender you said
24 someone classified at birth. And then when I asked you

1 about transgender girl you said assigned. Is there a
2 difference between classified and assigned in your mind?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: No, there wasn't a
5 distinction there.

6 BY ATTORNEY TRYON:

7 Q. Okay.

8 And could that sex of a child be assigned
9 before birth?

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: Yeah, possibly.

12 BY ATTORNEY TRYON:

13 Q. Going back to the bill itself, on line 12, on
14 page two, in the context of sports involving competitive
15 skill or contact biological males and biological females
16 are not, in fact, similarly situated. Do you agree with
17 that statement?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: I'm not sure what that
20 statement means by the fact similarly situated.

21 BY ATTORNEY TRYON:

22 Q. Okay.

23 Let's go to the next sentence. Biological
24 males would displace females to a substantial extent if

1 permitted to compete on teams designated for biological
2 females and then it cites a case. Do you agree with
3 that statement?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: I believe there can be a
6 fair playing ground for people who are born male and who
7 receive treatment, follow the rules and play the sport
8 for them to be able to participate as females.

9 BY ATTORNEY TRYON:

10 Q. So I take it you do not fully agree with that
11 statement.

12 Is that a fair statement?

13 A. Yeah.

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: I do not.

16 BY ATTORNEY TRYON:

17 Q. Item Number 5, line 21 says, classification of
18 teams according to biological sex is necessary to
19 promote equal athletic opportunities for the female sex.
20 Do you agree with that statement?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: Not if it means excluding
23 transgender athletes.

24 BY ATTORNEY TRYON:

1 Q. Okay.

2 I need to apologize at this point. On the
3 floor where I'm at they are doing construction, so
4 periodically you may hear pounding or other noise, and
5 I'm sorry about that.

6 Let me ask you about the definition of another
7 word that appears periodically, the word arbitrary. And
8 I looked that up in a dictionary, an online dictionary,
9 Cambridge.org, and the definition it gave me was based
10 on chance rather than being planned or based on reason.
11 Is that a fair definition of arbitrary?

12 ATTORNEY VEROFF: Objection.

13 THE WITNESS: I'm not sure.

14 BY ATTORNEY TRYON:

15 Q. Okay.

16 What is your definition of arbitrary?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: I'm not sure.

19 BY ATTORNEY TRYON:

20 Q. You have a Bachelor's Degree.

21 Right?

22 A. I do.

23 Q. And a Master's Degree.

24 Right?

1 A. Yes.

2 Q. So I recall you also have a Ph.D.

3 Is that right?

4 A. That is right.

5 Q. And you can't define for me what arbitrary
6 means?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: No, not at the moment.

9 BY ATTORNEY TRYON:

10 Q. You used the word arbitrary in this report, yet
11 you don't know what it means?

12 ATTORNEY VEROFF: Objection.

13 THE WITNESS: Yeah. Do you want to go to
14 where I used it?

15 BY ATTORNEY TRYON:

16 Q. No. I want to know if you, in fact, don't know
17 what arbitrary means?

18 ATTORNEY VEROFF: Objection. I think the
19 witness has asked to see where term is used in her
20 report. And it would be helpful to show it to her for
21 context.

22 ATTORNEY TRYON: Thank you, Counsel. I
23 would like the witness to tell me how she doesn't know
24 --- since she has a Ph.D., she can't tell me what

1 arbitrary means. And then you won't even agree with the
2 definition that I found in the Cambridge.org Dictionary.

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: Can you repeat that
5 definition again?

6 BY ATTORNEY TRYON:

7 Q. Based on chance rather than being planned or
8 based on reason.

9 A. Okay.

10 I'm going to go back and accept that.

11 Q. Okay.

12 In paragraph seven of your report --- we can go
13 back to the report now. This is Exhibit-2. In
14 paragraph seven that is on the screen or you can look at
15 your hard copy, you mention that you spent five years
16 teaching physical education and coaching tennis at
17 schools and summer camps. Tell me a little bit about
18 your coaching tennis.

19 A. Yes, I was the head coach of both the boys and
20 the girls team, high school. And the --- we had a
21 varsity and a junior varsity team. They competed in the
22 fall season. That was a team competition. And then the
23 individual in spring, so it is a year-round sport in
24 Texas.

1 Q. So why did they divide it between varsity and
2 junior varsity?

3 A. Because some of the kids are --- because it
4 gives the more advanced athletes a chance to compete at
5 the varsity level and can be very inclusive and give a
6 lot of kids an opportunity to play also as well with a
7 junior varsity.

8 Q. And you had no problem with that, right?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: That's right.

11 BY ATTORNEY TRYON:

12 Q. And then you said they divided it into boys and
13 girls teams. Why did they do that?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: Because, in general, that
16 classification works, but there are exceptions to it.

17 BY ATTORNEY TRYON:

18 Q. And when you said boys, what did you mean by
19 boys?

20 A. I mean those who may have been classified as a
21 male in their lives and also identify that way.

22 Q. So the team, the tennis team was based on those
23 who were born, classified as males and also identified
24 that way?

1 A. Again, I can't speak for every athlete.

2 Q. And then when you said there was a girls team,
3 what did that mean? What did you have to be to be on
4 the girls team?

5 A. Yeah. And in general, they are females and see
6 that classification as appropriate and participate as
7 females.

8 Q. And why is that classification appropriate for
9 tennis?

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: I think it's in general
12 appropriate to have --- to let males and females compete
13 separately.

14 BY ATTORNEY TRYON:

15 Q. Is that because in general males are better at
16 tennis?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: I wouldn't agree with that.

19 BY ATTORNEY TRYON:

20 Q. Then why is it appropriate to let them compete
21 separately?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: Yeah, I think males would,
24 in general, due to, you know, their physical

1 characteristics would have a --- could have an
2 advantage.

3 BY ATTORNEY TRYON:

4 Q. What kind of advantage?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: Yeah, greater --- greater
7 testosterone levels, which can lead to --- which can
8 impact muscle mass and size.

9 BY ATTORNEY TRYON:

10 Q. As the coach, did you actually observe that
11 there was a difference, performance difference between
12 boys and girls teams?

13 A. I would ---.

14 Q. I'm sorry. Let me rephrase that. As the coach,
15 did you actually observe that there was a performance
16 difference between boys and girls?

17 A. Yes.

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: I think if you compare the
20 mean level of ability across the two, then there is a
21 moderate difference, but there was --- there was big
22 differences within each gender. I had some very
23 talented males and some males that were not very
24 talented. And the same with females. Ability levels

1 really varied. And I had females across my years
2 coaching high school that were stronger than males. So
3 it is not a --- you have to be careful to say that every
4 male out performs every female because that has not been
5 my experience.

6 BY ATTORNEY TRYON:

7 Q. Understood. On the average, though, is it safe
8 to say that the boys out perform the females?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Right, if we just look at a
11 mean across the gender, yes.

12 BY ATTORNEY TRYON:

13 Q. Okay.

14 You used the word mean instead of average. Can
15 you explain?

16 A. Yes, on average.

17 Q. Okay.

18 I just want to make sure we are communicating
19 correctly.

20 A. Sure.

21 Q. Have you ever done --- looked at the standard
22 deviation, the bell curve for each of those groups?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: I'm familiar with the bell

1 curve. Do you mean ---?

2 BY ATTORNEY TRYON:

3 Q. Okay.

4 Have you looked at the bell curve for
5 performance between those two groups of tennis players,
6 boys versus girls?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: Okay.

9 I have been --- I haven't collected data
10 that I could share from when I coached high school.
11 What I could say is that, if we took any skill, let's
12 say their ability to serve accurately or hit a crisp
13 volley or hit a solid backhand across the court, that
14 their --- those bell curves are very close to each
15 other, but overall for just looking at the two groups
16 the boys could have a slight advantage. But those two
17 bell curves, if we are looking at the bottom of those,
18 you're going to say there is tremendous variability with
19 the males and females. And so it is easy to get kind of
20 focused on this small mean difference across gender when
21 there is huge differences across, you know, each gender
22 as well.

23 BY ATTORNEY TRYON:

24 Q. Understood. As far as the first standard

1 deviation, do you know if the first standard deviation
2 would overlap between two groups?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: I think so in high school
5 tennis, right.

6 BY ATTORNEY TRYON:

7 Q. Okay.

8 Have you actually --- that's from just your
9 generalized experience, but have you actually done a
10 data compilation to determine that?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: No.

13 BY ATTORNEY TRYON:

14 Q. Do you know of such a thing, any studies that do
15 that?

16 A. I couldn't identify specifically studies, but
17 when I see these things like if I --- if I pick up the
18 Kansas City paper or after the marathon I see males and
19 females interspersed all the way through with their
20 times, right. So it's not a thing where every male that
21 ran the marathon out performed every female that ran the
22 marathon. So I think it's pretty consistent that those
23 differences are smaller, too, if we are not talking
24 about the elite of elite athletes.

1 Q. When you were coaching, how long did you coach?

2 A. I coached four years full time and then my
3 graduate program at Greensboro I was --- I had an
4 assistantship at a Middle School to teach --- to assist
5 teachers with teaching physical education.

6 Q. In paragraph eight of your report it says that
7 you graduated with a Master of Science in sports
8 psychology/pedagogy from the University of North
9 Carolina in Greensboro, North Carolina, in 1990. During
10 that did you take any classes in sports biomechanics?

11 A. I believe I took one.

12 Q. What is sports biomechanics?

13 A. Sports biomechanics looks at the study of
14 movement and how to optimize skills and movement
15 patterns.

16 Q. And is it fair to say that the biomechanics of
17 males and females are different?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: With regard to everything
20 across the board, like walking?

21 BY ATTORNEY TRYON:

22 Q. In athletics --- well, we'll talk about in
23 walking. Is it different in walking?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: I would say there is more
2 similarity across the genders, more variability with age
3 than across genders on most movements.

4 BY ATTORNEY TRYON:

5 Q. Okay.

6 So you don't think there is a difference
7 between males and females in the context of
8 biomechanics?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Yeah, I think I just need
11 something more specific, right, if males in general can
12 generate more power or something in a particular
13 movement, that may be the case. It is not my area of
14 expertise.

15 BY ATTORNEY TRYON:

16 Q. Okay. Fair enough. Are you a psychologist?

17 A. I am not.

18 Q. Are you a psychiatrist?

19 A. No.

20 Q. Have you had any clinical experience seeing any
21 patients?

22 A. Not clinical experience, no.

23 Q. Other types of experience seeing patients?

24 A. No.

1 Q. And so I a presume you never treated any
2 patients?

3 A. That's correct.

4 Q. Have you ever worked as a counselor or social
5 worker?

6 A. No.

7 Q. Have you ever counseled with kids on either a
8 formal basis or informal basis on mental health issues?

9 A. I'm on the educational side of sports psychology
10 and so I might provide educational information, right,
11 about how to develop strong mental skills, right, that
12 are going to help you enjoy your sport better and
13 perform better, right. It's all on the educational
14 side, so not on a diagnosis side or treatment of mental
15 health. That would be beyond my credentials and I would
16 refer athletes to someone else.

17 Q. Okay.

18 Have you ever counseled with kids on gender
19 dysphoria issues?

20 A. I have not.

21 Q. Have you counseled with kids or young adults on
22 transgender issues?

23 A. I have not. To say that would be beyond my
24 expertise and training.

1 Q. Fair enough.

2 ATTORNEY TRYON: Well, we've been going a
3 little over an hour. I'm happy to keep on going. But
4 if you need a break, let me know.

5 ATTORNEY VEROFF: I think it would be
6 good to take a short break.

7 VIDEOGRAPHER: Going off the record. The
8 current time reads 11:15 Eastern Standard Time.

9 OFF VIDEOTAPE

10 ---

11 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

12 ---

13 ON VIDEOTAPE

14 VIDEOGRAPHER: We are back on the record.
15 The current time reads 11:27 Eastern Standard Time.

16 BY ATTORNEY TRYON:

17 Q. In paragraph nine of your report you refer to a
18 Coacher's Guide of Maximizing Youth Sport Experience.
19 And did you write that whole book?

20 A. With colleagues, we did.

21 Q. Does that book address transgender athletes at
22 all?

23 A. It addresses how to create an environment that
24 can be inclusive and help all athletes have a great

1 experience. It's not specifically written --- you know,
2 it's not about about transgender athletes overall. What
3 I would say they're included in the sense that it is
4 beneficial to be inclusive in sport.

5 Q. Is the term transgender, does it appear in the
6 book at all?

7 A. Beyond -- I'm not sure.

8 Q. When was that book written?

9 A. It was released in 2020.

10 Q. When was the first time that you became aware of
11 the issue of transgender girls participating in girls
12 sports?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: I'm not sure. Years ago. I
15 take conferences regularly, or sports psychology
16 conference, and there has been sessions for a long time.

17 ATTORNEY TRYON: Let me ask you to take a
18 look at some documents. Jake, if you can pull up the
19 document Cortisole and Stress Response during the Game
20 and Practice in Female Collegiate Soccer Players.

21 VIDEOGRAPHER: Do you want that marked?

22 ATTORNEY TRYON: Yes, this would be
23 Number 4.

24

1 (Whereupon, Exhibit 4, Article by Dr.
2 Fry, was marked for identification.)

3 ---

4 ATTORNEY TRYON: And just for the court
5 reporter, my name is spelled T-R-Y-O-N.

6 BY ATTORNEY TRYON:

7 Q. Okay.

8 This is a document, an article that you wrote,
9 correct, Professor Fry?

10 A. This was a Master's thesis from one of our
11 students and I served on her committee.

12 Q. I see. Who is Andrew Fry?

13 A. He's my husband.

14 Q. Okay.

15 Why did this document only focus on female
16 soccer players?

17 A. Typically, in a Master's thesis you kind of can
18 keep things smaller and tighter, and it's not like a
19 doctoral dissertation I think would be one of the key
20 reasons. There's probably been less research with
21 females and cortisol because it's a little more
22 complicated with menstrual cycles and all that, too.
23 And I think this athlete --- I'm sorry, this student was
24 very interested in any female student to the literature.

1 Q. Is there a difference in cortisol and stress
2 responses between male and female soccer players?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: Yeah, you know, this is ---
5 I would need to review this. And again, it's beyond my
6 expertise in looking at gender differences in cortisol.

7 BY ATTORNEY TRYON:

8 Q. So I'm a little puzzled. You said that you're
9 on the committee to review the students' work. Did I
10 get that about right?

11 A. I helped with this project, but this was her
12 thesis research, and she also had some I think
13 psychological measures. This has been a while. It was
14 published in 2007, but she was --- I'm not even sure I
15 could tell you what year she graduated or if this was
16 right over, but you know, quite a bit of time has
17 passed. I would have to go back and review this and it
18 is not my primary area of expertise, but I was an author
19 on this paper.

20 Q. So when you say you're an author, does that mean
21 you wrote portions of it or just supervised it?

22 A. You know, it varies and I would have to go back
23 to this one. Honestly, in reviewing it, I haven't
24 looked at this in a long time.

1 Q. Do you know how the student identified if
2 someone was a female?

3 A. I think she used a female collegiate soccer team
4 and so those were female athletes on the team.

5 Q. Do you know if any of those female athletes were
6 transfemales?

7 A. No, I don't.

8 Q. Would that have made a difference for the study
9 if some were transfemales and others were what I would
10 call biological females?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I don't know. And I think
13 it would depend on where the transathletes were.

14 BY ATTORNEY TRYON:

15 Q. Where they were? What do you mean?

16 A. I'm sorry, where they --- I'm sorry, Dana just
17 came in with cords and I got distracted for a second.
18 With where they were in the transitioning process.

19 ATTORNEY TRYON: Okay.

20 If you could bring up the next document,
21 Examination of the Psychometric Properties of Perceived
22 Motivational Climate in Sports Questionnaire.

23 VIDEOGRAPHER: I'm sorry. Can you repeat
24 that title?

1 psychometrics of the measure.

2 Q. Why was this one limited to female athletes?

3 A. It's a good question. Why does any researcher
4 includes females, males and/or both? Maria had access
5 to, as I remember, a massive tournament, volleyball
6 tournament, and could get the group onboard and be able
7 to access a lot of teams because research is hard to do.
8 You really need to be able to access a number of teams
9 and she was able to do that with this study.

10 Q. So you don't know why it would be separated to
11 be only for female athletes?

12 A. I think she was only interested in volleyball
13 and in particular females.

14 Q. Is there a difference in volleyball between
15 female and male athletes?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: A difference in what sense?

18 BY ATTORNEY TRYON:

19 Q. In psychometric properties, the perceived
20 motivational climate?

21 A. Okay.

22 So while she didn't look at that in the study
23 because she only had females, so we just have to look at
24 the broader literature, right. And the theory

1 predictions hold up in that athletes can perceive the
2 climate as very task involving or ego involving, right.
3 And in some samples athletes, you know, males or females
4 may see it one way or another more, but the predictions
5 just align consistently that if you perceive the task
6 involving climate at least to good things. Like people
7 have more fun and try harder, they're more committed to
8 their sports, they have better relationships with
9 others, those kind of things.

10 Q. All right.

11 ATTORNEY TRYON: I'm finished with that
12 exhibit then. Let me then ask you some other questions.

13 BY ATTORNEY TRYON:

14 Q. Is your expertise limited to sports psychology?

15 A. Sports psychology is a broad term, you know, but
16 yes, I would say that is my expertise. I don't know if
17 you would consider youth sport as a part of that.

18 Q. I'm sorry. I missed what you said.

19 A. The youth sport.

20 Q. Oh, youth support?

21 A. Yes, in particular within sports psychology my
22 focus has been on youth.

23 Q. Okay.

24 A. Not exclusively.

1 Q. So just to be clear, you are not an exercise
2 physiologist, right?

3 A. I am not.

4 Q. And you are not a medical doctor.

5 Correct?

6 A. That's correct.

7 Q. And you don't have expertise in the science of
8 performance advantage, do you?

9 A. No.

10 Q. And you have no expertise in sports safety. Is
11 that true?

12 A. Yes, true.

13 Q. And do you have any expertise in concussion
14 management?

15 A. No.

16 Q. Do you have any expertise in ACL injuries?

17 A. No.

18 Q. Have you done any research studies or papers
19 regarding transgender females in sports?

20 A. No.

21 Q. Have you taught any classes on that?

22 A. Not like a complete course, but it's a topic
23 that we can cover in our undergraduate score psychology
24 class.

1 Q. And so is that a class that you teach?

2 A. Yes.

3 Q. And what exactly have you covered with regard to
4 transgender females in that class?

5 A. So late this semester I'm teaching the class and
6 later in April we have a trans --- a transfemale who is
7 a retired athlete and coach coming in for that day and
8 we will probably take a partial class before that just
9 to have some discussions and lay some groundwork. It is
10 an educational session where we just --- we have
11 students who may be well informed and passionate about
12 transathletes in sport and we have had other students
13 who have had very little exposure. So it's not a big
14 --- it's not a big chunk of the class, right, it's a
15 class or two that we touch on it.

16 Q. Aside from any research, have you attended any
17 seminars or classes on transgender females in sports?

18 A. Yes. Typically at our national conference, the
19 Association of Applied Sports Psychology, you know,
20 that's a jampacked schedule, and probably most
21 conferences I'll sit in on a session. Sometimes they
22 --- they will do a webinar, things like that. So over
23 the years, yes, I have participated in those.

24 Q. Have you reviewed any literature on transgender

1 participation in sports to prepare your opinion in this
2 case?

3 A. Like over the last two years I've read some. I
4 couldn't point or identify, hey, this is exactly the
5 literature I've read. Just someone who's reading often
6 in my --- you know, within sports psychology.

7 Q. Your bibliography doesn't include any papers
8 studying transgender athletes, does it?

9 A. No.

10 Q. And have you done any studies or papers
11 regarding the harm to motivation on females when
12 biological boys or trans/transgender girls are allowed
13 to compete on girls teams?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: I have.

16 BY ATTORNEY TRYON:

17 Q. Do you mean have not?

18 A. I'm sorry, have not.

19 Q. Have you taught any classes on that topic?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: I have not.

22 BY ATTORNEY TRYON:

23 Q. Have you attended any seminars or classes on
24 that topic?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: I have not.

3 BY ATTORNEY TRYON:

4 Q. Have you prepared any papers regarding
5 differences for motivation between males and females?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: Yes.

8 BY ATTORNEY TRYON:

9 Q. Okay.

10 Well, what are those?

11 A. Okay.

12 I think in, oh, gosh --- in --- sometimes in
13 papers we, you know, we see if there were gender
14 differences in terms of motivation. When there are
15 differences they're slight and we are back to that bell
16 curve mean thing that there might be a slight difference
17 but they don't impact the hypotheses in the sense that
18 --- in the sense that someone has a high task
19 orientation and/or perceives a task involving climate or
20 caring climate, whether you are male or female those
21 predictions hold up in terms of the outcomes.

22 Q. Are there papers in your bibliography that would
23 show that to be the case that it's the same for boys and
24 girls. Feel free to take a look at it. You have got it

1 there.

2 VIDEOGRAPHER: I would note that we
3 gained another participant. If they would identify
4 themselves for the record.

5 ATTORNEY PELET: Good morning. My name
6 is Valeria Pelet del Toro for Cooley, LP, for Plaintiff
7 BPJ.

8 THE WITNESS: Thank you for that time.
9 The Hogue, Fry and Fry 2017, I have to review that
10 paper. I can't remember if there were any gender
11 differences. These were Middle School kids who
12 were ---.

13 BY ATTORNEY TRYON:

14 Q. Let me stop you for just a second. Can you tell
15 me what page that's on?

16 A. Yes, page 14, the second from the last
17 reference.

18 Q. And which one is it again?

19 A. The Hogue Fry and Fry, 2017.

20 Q. Page 14 you said?

21 A. Yes, page 14, the second reference from the
22 bottom of the page.

23 Q. I'm seeing Walling, M.D.

24 A. Okay. Sorry.

1 Q. Maybe the pagination is different on your copy.

2 A. I'm sorry. Are you looking at the expert report
3 and Declaration?

4 Q. Yes, I am.

5 A. Okay.

6 It should be the same. If you go in
7 alphabetical order, Hogue with an H, H-O-G-U-E.

8 Q. Okay.

9 Here is the issue. I see. Hogue, et cetera.

10 A. Yes.

11 Q. There's two by Hogue. Which year? They're both
12 2013.

13 A. The 2017.

14 Q. What is the title?

15 A. The title is the Differential Impact of
16 Motivational Climate on Adolescents Psychological and
17 Physiological Stress Responses.

18 ATTORNEY TRYON: It is on page three.
19 Can you bring that up, Jake? It is under 14.

20 VIDEOGRAPHER: I was trying to look for
21 it too.

22 ATTORNEY VEROFF: I think there is two
23 page 14s. So there is a bibliography that directly
24 follows the expert report and then there is the

1 citations that are encompassed in Exhibit A, the first
2 page 14.

3 ATTORNEY TRYON: Thank you, Julie, for
4 helping us out with that. I see it now. I'm sorry for
5 that confusion.

6 BY ATTORNEY TRYON:

7 Q. You were going to explain that paper.

8 A. I'm sorry. Did you ask me to explain the paper?

9 Q. Yes. You were starting to talk about that, so I
10 would appreciate if you could talk about that?

11 A. So in this study Middle School kids are
12 recruited to participate in an intervention. They come
13 in and they learn an activity. And they're assigned ---
14 randomly assigned to either caring task involving
15 climate or an ego involving climate. And as they
16 participate across the interventions, their cortisol is
17 measured. Cortisol is a stress hormone and it can
18 indicate that people are experiencing higher stress.
19 And so in this study we found that athletes in the
20 caring task environment climate, their cortisol levels
21 actually decreased, right, suggesting that they were not
22 stressed. In addition they had more fun, they indicated
23 they tried harder, they made more progress learning the
24 activity, they experienced, you know, less shame, less

1 embarrassment, less anxiety. That is what I'm recalling
2 from memory, okay. There are probably a couple of other
3 things.

4 And if they participated in an ego involving
5 climate you got to flip all of those. They didn't have
6 as much fun, didn't indicate that they wanted to
7 continue with the activity and their cortisol levels
8 were significantly higher than those in the other group.
9 And the results were consistent for males and females.
10 What I would have to go back and check is were there any
11 --- going back to these slight mean differences, were
12 there any differences between the males and females in
13 the other variables. And that I couldn't tell you
14 without reviewing it. But in general, the purpose of
15 the study was to see how this environment affects kids
16 and the results were similar for males and females.

17 Q. And what age group was that?

18 A. This was Middle School, so six, seven and eight
19 graders. I think it leaned heavier on the six grade,
20 seven grade participants, but the mean age was probably
21 12.

22 Q. Any other papers in your bibliography talking
23 about whether or not there is a difference between males
24 and females and how they are motivated, if there is any

1 difference between them that is?

2 A. Yeah. I think with any of these studies,
3 honestly, I just have to go back and see if there were
4 any minor little differences between gender, but across
5 gender the results are consistent.

6 Q. Okay. All right.

7 Let me ask you, have you prepared any papers
8 regarding motivations for biological boys identifying as
9 girls?

10 A. I have not.

11 Q. Have you prepared any papers regarding
12 transgender girls?

13 A. I have not.

14 Q. Have you studied that issue?

15 A. No.

16 Q. Would that be something worth studying?

17 A. It could --- I'm sorry. Could you repeat that?

18 Q. Motivation regarding transgender girls?

19 A. Yes, it could be valuable.

20 Q. As far as you know, has anyone studied that?

21 A. Yeah, I --- you know, I hear people saying, you
22 know, that there is just going to be more and more
23 research coming out. I think there is isolated papers
24 out there probably that people have had a look at or ---

1 but I couldn't name them right now for you.

2 Q. Have you prepared any papers regarding coaching
3 transgender girls versus biological girls?

4 A. I have not.

5 ATTORNEY VEROFF: Objection.

6 BY ATTORNEY TRYON:

7 Q. Are you aware of any studies that do address
8 that?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: No.

11 BY ATTORNEY TRYON:

12 Q. Have you prepared any papers regarding the
13 opportunity for collegiate athletic scholarships
14 motivates student athletes?

15 A. Have I prepared any papers?

16 Q. That is my question.

17 A. No.

18 Q. Would you agree that the opportunity for
19 collegiate athletic scholarships does, in fact, motivate
20 the student athletes?

21 A. Some student athletes.

22 Q. Now, you qualify that as some. Any idea what
23 that percentage might be?

24 A. No.

1 Q. Are you familiar with Title 9?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: Yes, to some degree.

4 BY ATTORNEY TRYON:

5 Q. Tell me what your understanding of Title 9 is in
6 the context of girls sports.

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: More opportunities are
9 provided to girls to the same degree as boys and that
10 fairness is given across other aspects of resources and
11 so on, facilities and things like that.

12 BY ATTORNEY TRYON:

13 Q. Have you ever written any papers on Title 9?

14 A. No.

15 Q. Have you written any papers on college
16 scholarships for girls?

17 A. On college scholarships for girls?

18 Q. Yes.

19 A. No.

20 Q. So you wouldn't be an expert on that, would you?

21 A. No.

22 Q. Have you submitted any comments to the
23 Department of Education on proposed rules or regulations
24 under Title 9?

1 A. No.

2 Q. Let me ask you a question a little bit different
3 than the one earlier. Can the opportunity for
4 scholarships for girls collegiate sports be a motivator
5 for girls to compete in girls sports?

6 A. It can be for some athletes.

7 Q. So in paragraph 11 of your expert report, which
8 is Exhibit-2, it says on the national level I've served
9 with the Association of Applied Sports --- Sport
10 Psychology, AASP, as a member of the Program Review
11 Committee. That is correct, isn't it?

12 A. Yes.

13 Q. It's my understanding that the purpose of that
14 organization is primarily to help train coaches.

15 Is that fair?

16 A. No, that would be not accurate.

17 Q. Tell me the purpose of it.

18 A. Okay.

19 It is an organization of professionals that work
20 in the area of sport and exercise psychology and to say
21 there's probably two aims, that these professionals are
22 trying to help people, a wide variety of people across
23 the lifespan reap off the benefits from participation in
24 physical activity and also help people perform up to

1 their potential or help them perform better. It is a
2 mix of the organization. There are people who are
3 faculty members and people that are involved in the
4 team, are involved in programs but there's also people
5 that are trained on the clinical side or that are more
6 focused on sort of counseling aspects of sports
7 psychology.

8 Q. Are you actually a member of the organization?

9 A. Yes, I am.

10 Q. Now, on the website it said that there is 2900
11 members in 50 countries. Is that about right to your
12 knowledge?

13 A. That sounds right.

14 Q. So I divided that out. That would be 58 per
15 country. That doesn't sound very big per country. So
16 let me ask you, do you know how many of those are
17 members are in the United States?

18 A. I don't know. I would guess it's heavily
19 weighted in the U.S. I would say over half. I think
20 there's a lot of countries that might have one person or
21 so. So even though 50 countries are represented, you
22 know, some of them are small and may have a really small
23 participation, right.

24 Q. Okay. Fair enough.

1 So you mention in this paragraph the
2 certification exam. So there is a certification exam.

3 Is that right?

4 A. Yes. It's pretty new. There has been a
5 certification. The fact that it is exam based is a new
6 direction over the last few years.

7 Q. What is the purpose or meaning of that
8 certification?

9 A. It's called CMPC, Certified Medical Performance
10 Consultant, and it is good for the field because the
11 people who have that credential, it designates sort of,
12 you know, acceptable level of competence to go out and
13 to work with athletes and coaches. So there is a number
14 of courses people have to have. They have to have hours
15 of training working directly with athletes. And then
16 when they complete all those requirements they take ---
17 they take an exam.

18 Q. Have you taken the exam?

19 A. I'm --- I'm about to in the coming months. A
20 little back story on this is that the certification
21 originally came out as I was wrapping up my doctoral
22 training, and I would have needed to stay another year
23 to get the other requirements that I was missing and my
24 doctoral advisor at the time said, you know, yeah, I'd

1 just go and graduate and get rolling in your career.
2 And she wasn't sure if this would take off or how big a
3 deal it would be, and so over the years it has been sort
4 of slow to take off. I have, for example, people come
5 and say do you have this AASP Certification until the
6 last year or two. So I think the public is becoming,
7 you know, more aware of it.

8 I was asked to write the chapter in the
9 Essentials Text, which is really the text for people to
10 prepare for the exam. And so I was asked to write the
11 motivation chapter, a key chapter on motivation
12 theories. And so there's this double blind system on
13 writing one of the chapters that I needed to wait longer
14 to actually take the exam. But currently I'm an
15 approved mentor to train students who are seeking the
16 certification.

17 Q. But you don't have the certification at this
18 point.

19 Correct?

20 A. Right. Just as a mentor. I have --- I received
21 all the thumbs up on every --- on --- you know, you
22 submit a packet of materials showing you have all the
23 credentials and all. So I've done that. I just need
24 now to sit for the exam. And I haven't done that yet.

1 I will probably do it once the semester is over.

2 Q. Do you consider yourself an athlete?

3 A. I'm smiling. I do.

4 Q. Okay.

5 A. I work closely with the Women's Inner Sport
6 Network in Kansas City and they say that should be the
7 mantra. Every female should say I'm an athlete. I'm
8 not currently competing.

9 Q. Okay.

10 What sports have you participated in?

11 A. Tennis and softball were my primary sports.

12 Q. And when did you compete in or participate in
13 those?

14 A. Softball was kind of a Middle School thing and I
15 transitioned to tennis as I hit high school and competed
16 through high school and college and then probably
17 through my 20s still competing in tournaments around the
18 state.

19 Q. So after college were you still competing in
20 some fashion?

21 A. I was, yeah. Just one of the nice things about
22 teaching and you have that summer break. And my friends
23 enjoyed playing so we would play in tournaments around
24 the state.

1 Q. Did you want to win?

2 A. I did.

3 Q. And so were you --- let's go back to the terms
4 you already mentioned, like ego oriented and task
5 oriented, right?

6 A. Uh-huh (yes), yes.

7 Q. And so tell me just in layman's terms what those
8 mean.

9 A. Okay.

10 They were developed in a theory by a guy named
11 John Nicholls and he said --- what he was really --- the
12 question he was trying to address is what should we be
13 doing if we are trying to help every athlete reach their
14 own potential. And so his theory it has three facets to
15 it. One is the goal orientation and those refer to your
16 personal definition of success. And so some people ---
17 he identified two, task orientation and ego. And people
18 who have a high task orientation, they really feel most
19 successful when they can walk away knowing they gave
20 their best effort and they're focused on their
21 improvement over time. But that is where genuine
22 feelings of success come.

23 In contrast, some people have a strong ego
24 orientation and they're more focused on how they compare

1 to everyone or are they winning. And they may say,
2 yeah, good for me, I tried hard, who cares. What I care
3 about is how did I compare to everyone. Did I
4 demonstrate confidence? Did I look better than others,
5 did I win?

6 Q. And can somebody have both an ego orientation
7 and a task orientation?

8 A. Yes. They can be high in both, high in one and
9 low in another.

10 Q. And when you were playing tennis, were you ---
11 which one were you? Ego oriented or task oriented?

12 A. I think I've always had a high task orientation.
13 I just loved sport and the chance to complete, and I
14 would say I had a moderate ego orientation.

15 Q. Is one better than the other?

16 A. It depends what your aim is. If we want
17 athletes to have fun and to keep playing and to try hard
18 to have good relationships with others and to be good
19 sports, then we should try to promote task orientation
20 because ego orientation is not related to those things
21 pretty consistently.

22 Q. And under your theory then should we try to
23 suppress ego orientation?

24 A. No. I think the second part of the theory is

1 what kind of environment we create for our athletes, and
2 so the research is very strong in this area suggesting
3 many benefits when we can create a task and a caring
4 climate for athletes. So the problem with the climate
5 for a coach is that you really need to pick what am I
6 going to do because you can't do both or it becomes a
7 wash or a neutral environment. So those features of
8 each of the climates, they're really in direct contrast
9 with one another.

10 Q. When you say you are an athlete, what does that
11 mean to be an athlete?

12 A. You know, for me it means someone who just loves
13 having the opportunity to do their best and to try and
14 improve and to walk away on one --- you know, today I'm
15 going to go out there, I'm going to give my best and
16 tomorrow I'm going to get up and go do it again whatever
17 happened, right, because there is just so much fun and
18 joy that comes from having that opportunity.

19 Q. So just as I recall you said you do like to win,
20 right?

21 A. I do.

22 Q. And you can like to win and want to win whether
23 you are personally ego oriented or task oriented, right?

24 A. Absolutely. I mean, who plays sports and

1 doesn't want to win. I mean, that's just sort of a
2 given. What does winning mean for us, right? Is it a
3 chance for me to kind of put my chest out and say I'm
4 better than you, I beat you, or is it kind of a
5 celebration of me being able to say, boy, I've worked
6 hard and I can see I'm improving, right.

7 Q. Right. But if you are in an environment where
8 you basically are prevented from winning, that would be
9 very discouraging.

10 Right?

11 A. I'm not aware of any of those environments where
12 you are prevented from winning.

13 Q. Well, what if the coach doesn't let you play?

14 A. Does that mean like you're not a starter or ---
15 is that what you're referring to?

16 Q. Well, if you are just a bench warmer, would that
17 be discouraging to some people?

18 A. You know, this comes back to the climate. If a
19 coach is saying you're an important part of this team
20 which is one of the features of a task and caring
21 climate, right, you're valuable, you push everybody,
22 your opportunities are going to be coming. And what
23 it's really about is let's do all we can to help you
24 keep developing, right. If we are just like, hey,

1 please stay out of the way, go sit at the end of the
2 bench, go down to the end of the court because I'm
3 working with these few star athletes I've got here, then
4 yeah, it would be discouraging.

5 Q. Would you agree that rules are important in
6 sports?

7 A. Yes.

8 Q. So you mentioned you have played tennis and
9 softball. And what other sports are you familiar with?

10 A. Played a little bit of volleyball going through
11 --- yeah, you know, I grew up in Texas and tennis is
12 just a year-round sport, right.

13 Q. Right.

14 A. So that is a lot of my experience. My son is a
15 baseball player, so I've watched an awful lot of
16 baseball as well.

17 Q. Are you familiar with track and cross-country
18 even though you haven't done it?

19 A. Yeah, yes.

20 Q. Are you familiar with football?

21 A. Yes.

22 Q. So how about basketball?

23 A. Yes.

24 Q. Who is going to go on in the final four?

1 A. Absolutely. A little excitement here in town.

2 Q. Yes. So do sports have to be athletic to be
3 sports?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: Do they have to be
6 athletic?

7 BY ATTORNEY TRYON:

8 Q. That is my question.

9 A. Okay.

10 I think it just depends on how you define
11 athletic.

12 Q. Well that's what I'm wondering. So for example,
13 are video games sports?

14 A. You know, some universities are considering
15 those. They have sports teams and they are considering
16 that part of the athletics. It's not my particular area
17 of interest.

18 Q. Okay.

19 So some sports are solo and some are with
20 teams.

21 Is that a fair statement?

22 A. Yes and no. Again, I would say it is how you
23 define it, right. If you are going to say a track team
24 with the best individual, I would say there is relays

1 and it depends how the coach approaches it. Are we just
2 a lot of individuals doing our thing out here, are we a
3 team working together?

4 Q. Well, when you --- so that may be in high school
5 there is teams. But outside of high school or college
6 there are sports you participate in that, for example, a
7 marathon, you could be on a marathon and simply you're
8 participating as an individual, right?

9 A. Uh-huh (yes), I agree.

10 Q. And but --- so some athletic events can be done
11 without being on a team. Are there others that you can
12 think of besides marathons?

13 A. Sure. As people graduate and they can run
14 races, yeah, they can participate in weightlifting.

15 Q. And a lot of these things ---?

16 A. They could have ---.

17 Q. Sorry to interrupt you. Go ahead.

18 A. I'm sorry. They could swim. I'm just throwing
19 out another one.

20 Q. Yeah. So swimming is both --- you do it as a
21 sole --- as an individual but also as part of a team in
22 high school and college, right?

23 A. Right.

24 Q. And both cases you, as an individual, want to

1 win in these sports but also you're trying to help your
2 team win. Is that a fair statement?

3 A. Yes, at its best.

4 Q. And there is sometimes when you feel like
5 running, it can be something you just like to run. You
6 don't have to be on a team or you can compete, you just
7 run on your own, right?

8 A. That's true.

9 Q. I see little kids, why walk when you can run.
10 So that's something that you can do alone or you can do
11 with your family, right?

12 A. Uh-huh (yes).

13 Q. Is that a yes?

14 A. Yes, sorry.

15 Q. Thanks. And it's something you can do either
16 competitively or not competitively, right?

17 A. Yes,

18 Q. Now when you're on a team, for example, a track
19 team, you're competing against other people on your
20 team.

21 Is that right?

22 A. Again, I would just say --- I would just check
23 --- that is not how I would phrase it if I were a coach,
24 that we're competing against each other. I would say we

1 are a team and we are working together to bring out the
2 best in each one of us, but the goal is every athlete
3 reach their potential.

4 Q. But every one of those kids on a track team
5 still wants to be the best on the track team as a
6 general rule, right?

7 A. I don't know that that is necessarily true, but
8 I think they want to compete and they want to do well.
9 I would agree with that.

10 Q. I probably overstated that, but many of them ---
11 at least some of them want to be the best on the team,
12 the fastest on the team, right?

13 A. Yes.

14 Q. So those are the people that are comparing
15 themselves to others and just want to be --- so they
16 would be ego centered, ego oriented.

17 Is that right? But not necessarily?

18 A. Yeah, not necessarily.

19 Q. Okay.

20 A. Do you want me to comment on it?

21 Q. Sure.

22 A. Okay.

23 If I could just use an example. Like a track
24 athlete, Al Oerter was an athlete in the '50s and '60s,

1 he won four gold medals consecutively across four
2 Olympics, it's crazy, throwing the discus. And he said
3 --- a reporter asked him how did you beat the world, how
4 were you so great, how were you better than everybody
5 else these four Olympics, and he said --- his response
6 was like that's nonsense. It is never about being
7 better than somebody else. It's about being the best
8 that you can be, right. And so what if is just good
9 enough. What if I beat you, good, but maybe I can be so
10 much better than that. So for my sights to be set on
11 just being better than you it is limiting, right. And
12 if you are so much better than me and so much less
13 talented, why don't I just focus every day on being the
14 best that I can be, right. So Al Oreter, you think four
15 time Olympic gold medalist, he's got to be high on ego
16 orientation. He's somebody who's really high in task
17 and would have been lower. But we could look at other
18 athletes that would be the flip and definitely. So when
19 you say athletes who want to win that doesn't
20 distinguish the task and ego aspect of it.

21 Q. So task and ego orientation doesn't affect
22 somebody's desire to win. Desire to win is separate
23 from the ego versus task orientation, that's what you're
24 saying, right?

1 A. I think it comes down more to what does winning
2 mean.

3 Q. All sports have rules, we've established that,
4 right?

5 A. Uh-huh (yes).

6 Q. Is that a yes?

7 A. Yes.

8 Q. The purposes of the rules is, one, tells you how
9 to play the game, right?

10 A. Yes.

11 Q. Another is for safety. You have rules for
12 safety, is that right?

13 A. Yes.

14 Q. And you have rules to make things fair, right?

15 A. Yes.

16 Q. What other reasons do we have rules in sports?
17 Does that cover it?

18 A. Nothing else comes to mind right now.

19 Q. Who generally makes rules for sports?

20 A. The leagues and sports organizations per se.

21 Q. Would it be fair to say that the participants
22 rely on the rules?

23 A. Rely on the rules?

24 Q. Yes.

1 A. Fair to say that participants when they join a
2 league or, you know, their understanding that there are
3 rules that they need to abide by.

4 Q. And they expect that others have to abide by
5 those same rules; right?

6 A. Yes.

7 Q. And it is important to have consistent rules,
8 rules that don't change periodically, right?

9 A. I think rules change all the time in sports.

10 Q. Why do they change?

11 A. I think they change because they are recognizing
12 those things that you mentioned that maybe something
13 would be safer or something would be more fair or more
14 inclusive.

15 Q. And sometimes those changes are made in
16 anticipation of problems, not waiting for problems to
17 happen.

18 Is that fair?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: Yeah, I'm not sure.

21 BY ATTORNEY TRYON:

22 Q. Okay.

23 What about safety, rules for safety, do
24 sometimes safety rules anticipate problems and sometimes

1 they react to problems that have already occurred?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: Yes.

4 BY ATTORNEY TRYON:

5 Q. Is that a yes?

6 A. Yes.

7 Q. And then how about fairness, we have rules
8 designed for fairness and those are sometimes set in
9 motion because of something that has happened, right?

10 A. Uh-huh (yes).

11 Q. Yes?

12 A. Yes.

13 Q. And other times it's in anticipation of problems
14 that we see might come down the road but we want to set
15 rules for fairness, right?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Yes.

18 BY ATTORNEY TRYON:

19 Q. And in all sports there is scoring, right?

20 A. Yes.

21 Q. That is part of the rules, right?

22 A. Uh-huh (yes), yes.

23 Q. And those scores decide who wins, right?

24 A. Yes.

1 Q. Would you say scoring is a motivator?

2 A. For some athletes.

3 Q. When an athlete perceives something as being
4 unfair, that's a de-motivator, would you agree?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: In some cases.

7 BY ATTORNEY TRYON:

8 Q. So sports also have rankings, individual
9 rankings and team rankings, right?

10 A. That's right.

11 Q. And for some athletes those rankings are
12 motivators, right?

13 A. Yes, for some.

14 Q. And sports, you give out trophies for winners,
15 right?

16 A. I'm sorry. You broke up.

17 Q. In sports we give out --- at least in some cases
18 we give out trophies to winners, right?

19 A. In some cases.

20 Q. So let me see if I understand. Are you
21 advocating that sports should eliminate scoring?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: No.

24 BY ATTORNEY TRYON:

1 Q. Are you advocating that they should eliminate
2 rankings?

3 A. I don't think it would hurt at lower levels. I
4 don't think we need to have have a focus on that when
5 you're five or six years old, on rankings, and we ought
6 to be focused just on learning the game and having fun,
7 but in general I'm not opposed to us having ---
8 identifying winners and ranking teams and so on.

9 Q. And sports teams, the coaches decide who plays
10 in different positions in different games.

11 Is that right?

12 A. That's right.

13 Q. And should how good the student athlete is have
14 anything to do with when, where and how to play
15 according to the coach?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Should the athlete's talent
18 have something to do with how much playing time they
19 get?

20 BY ATTORNEY TRYON:

21 Q. That would be a fair way to characterize my
22 question, yes. What is your answer?

23 A. I would agree with that particularly as we move
24 up in levels. I really like the rules that some youth

1 sport leagues have that we have eight-year-olds and
2 we're not just going to say, hey, Julie, you're on the
3 bench because you're not as good so you don't get any
4 playing time. I like the rules that say everybody gets
5 in there a few innings and gets some playing time or
6 gets to bat, or whatever the sport might be. So I think
7 it really varies on what sport we are talking about.

8 Q. Let's look back at your report, Exhibit-2. Look
9 at paragraph 35. Do you see that?

10 A. Yes, I do.

11 Q. The first sentence says, thus the benefits
12 associated with youth and young adult sport are not
13 limited to whether athletes are winning competitions,
14 where they are ranked in their sport or what level of
15 publicity they are getting.

16 Do you see that?

17 A. Yes.

18 Q. So you would agree with me that one of the
19 benefits is the opportunity to win competitions.

20 Right?

21 A. I would probably word it one of the benefits is
22 the opportunity to compete.

23 Q. Well, here you say winning. You say it is not
24 limited to whether athletes are winning, which suggests

1 that winning competitions is one of the benefits.

2 Correct?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: Yeah. I think what I mean
5 by that is if only --- if you have to win to have a
6 great experience in sports, then half of our teams are
7 not going to have a good experience, right. So what I'm
8 suggesting here is that and as the data backs this up
9 that if you are in a good climate, then you can go out
10 there and have fun and try hard and maybe your team
11 didn't end up with a winning record, but you can still
12 reap the benefits. And so it is not the case that only
13 winning teams reap these benefits that come along with
14 sports.

15 BY ATTORNEY TRYON:

16 Q. So you are saying winning is not a benefit?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: I'm going to say winning
19 can be a benefit. It's not a primary one in my mind in
20 sport, but yes, winning can help us see our improvement
21 and, you know, winning has its place for sure.

22 BY ATTORNEY TRYON:

23 Q. And you see athletes when they win, they are
24 pretty excited, aren't they?

1 A. Many of them are.

2 Q. Well, have you ever seen anybody disappointed
3 about winning?

4 A. Maybe not disappointed, but if --- let's just
5 say you are really skilled in tennis and you come and
6 you know, you leave me behind, you beat me 6061, there
7 might not be a lot of joy for you in beating me, right,
8 but for some athletes it might be, hey, it's another win
9 for me and I'm super excited about that. So that is
10 what I mean.

11 Q. And where they're ranked in their sport, that is
12 one of the benefits.

13 Right?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: Yeah, I think we may have a
16 different view on benefits. With benefits I'm just
17 thinking what's going to help us long term. And it
18 reminds me of this Olympic gold medalist who said her
19 kid was going through kind of a junk drawer and found
20 her gold medal, right. So winning --- she's a gold
21 medalist, didn't mean as much as all the experience and
22 just reflecting on the ability to give your best effort
23 and to build these relationships and to push yourself so
24 hard. Those seem like benefits more than, you know, the

1 trophy or something winning. I'm not disputing that
2 winning, yeah, can be fun and it is definitely part of
3 sport.

4 BY ATTORNEY TRYON:

5 Q. Yeah. And so all those things you just
6 mentioned certainly are benefits to sports. I'm not
7 trying to suggest that's not the case. I just want to
8 understand when you say in this paragraph, thus benefits
9 associated with youth and young adult sports are not
10 limited to whether athletes are winning competitions,
11 where they are ranked in their sport or what level of
12 publicity they are getting, it's not limited to that,
13 but it does include those three things, right?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: I'm going to give you that
16 those are benefits. I'm just going to put them down
17 lower on what we value.

18 BY ATTORNEY TRYON:

19 Q. Okay.

20 A. Or more important benefits.

21 Q. Is the opportunity to get a college scholarship
22 also a benefit in youth sports?

23 A. For a very small proportion of children in youth
24 --- in our youth sport world are able to secure college

1 scholarships and go on, and so our youth sport world
2 shouldn't be centered around that I believe.

3 Q. But for those that want to and can get college
4 scholarships, that is a big benefit for them, right?

5 A. Yes, that's very cool.

6 Q. And it can be worth tens of thousands of
7 dollars, right?

8 A. Yes, it can.

9 Q. And even just being recruited to play on a
10 college team, that's a big benefit for high schoolers,
11 right?

12 A. Yes, for some.

13 Q. Well, right, for some. And in order to get
14 there you need to be able to --- have the opportunity to
15 --- well, strike that.

16 And for obviously a smaller minority still the
17 opportunity to ultimately go on and play professional
18 sports, that is another benefit, right?

19 A. Yeah, it's a benefit for such a small proportion
20 that, again, I would just say that's not how we should
21 set up our sports world, for those few.

22 Q. I understand that, but nonetheless there are
23 many who never get to that place, but that's what they
24 strive for and that's one of the reasons why they are in

1 sports, right?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: I think there could be
4 people like that for sure.

5 BY ATTORNEY TRYON:

6 Q. And same thing with scholarships, there are a
7 lot of kids that want to get scholarships, they may not
8 get them, but they're in sports because they want to get
9 that scholarship and they think they'll be able to.
10 Fair statement?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: Yeah, I'm not sure what the
13 percentages are. There are probably a lot more who
14 would like to have a college scholarship who don't
15 receive them because of the small proportion who do,
16 right. But definitely. That's called extrinsic
17 motivation. If I'm just playing a sport because that's
18 the --- that's what I'm going for is a scholarship,
19 yeah, there could definitely be athletes focused along
20 those lines.

21 BY ATTORNEY TRYON:

22 Q. And would you agree that colleges generally
23 select scholarship athletes from the pool of people that
24 are actually playing high school athletics? That is a

1 correct statement, right?

2 A. I would say the majority have played high school
3 athletics, yes.

4 Q. And those that are seeking that scholarship are
5 athletes who use their high school performance to
6 compete for college scholarships, right?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: Yes, probably many do.

9 BY ATTORNEY TRYON:

10 Q. And the market for athletic scholarships is, in
11 fact, competitive, right?

12 A. Many schools it is. Definitely not all schools,
13 though.

14 Q. Okay.

15 What would it be otherwise?

16 A. I think some of the --- some smaller schools
17 just will --- we have a local college that will give
18 students like \$8,000 or \$10,000 a year towards their
19 tuition fees if they participate on a sport team. And
20 of course, you know, there has to be some level of skill
21 there, but I wouldn't --- it is a good place for people
22 who want to continue to play a sport but may not have
23 the highest skill levels and definitely aren't being
24 recruited at the division --- for the most part, a

1 Division I level or something like that.

2 Q. But they still compete for that scholarship,
3 fair enough?

4 A. Yes.

5 ATTORNEY VEROFF: We've been going for a
6 little over an hour. I just wanted to check in see,
7 David, if you have a sense of when you are wrapping up
8 this module. Maybe it would be a good time to take a
9 break.

10 ATTORNEY TRYON: Yes, give me another
11 five minutes and we can break if anybody wants to.

12 ATTORNEY VEROFF: Great.

13 ATTORNEY TRYON: Well, we can break right
14 now. I'll leave it up to the witness. I'm not going to
15 force it upon the witness or Plaintiff's Counsel. Would
16 you like a short break?

17 THE WITNESS: That would be great. Thank
18 you.

19 ATTORNEY TRYON: Let's go back how about
20 20 till. Does that work?

21 VIDEOGRAPHER: Going off the record. The
22 current time reads 12:32:00 p.m. Eastern Standard Time.

23 OFF VIDEOTAPE

24

1 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

2 ---

3 ON VIDEOTAPE

4 VIDEOGRAPHER: We are back on the record.

5 The current time reads 12:41 Eastern Standard Time.

6 BY ATTORNEY TRYON:

7 Q. So let me then ask you, Professor Fry, have you
8 heard of the International View for Sociology of Sport?

9 A. That journal?

10 Q. Yes.

11 A. Yes, I've heard of it.

12 Q. Okay.

13 Are you familiar with Warren Whisenant?

14 A. No.

15 Q. Okay.

16 How about Jeremy S. Jordan?

17 A. No.

18 Q. Okay. Fair enough. Let me show you Exhibit ---
19 if we could mark this, I guess we're at Exhibit 6,
20 Fairness and Enjoyment in School Sponsored Youth Sports.
21 If you could bring that up, Jacob.

22 ---

23 (Whereupon, Exhibit 6, Fairness and
24 Enjoyment in School Sponsored Youth

1 Sports, was marked for identification.)

2 ---

3 ATTORNEY TRYON: Jacob, if you could just
4 put --- I think we've done this before. Put this in a
5 PDF in the chat box, can you do that?

6 VIDEOGRAPHER: Yes, I just have to do
7 that while it is not being shared and then I can share
8 it again.

9 ATTORNEY TRYON: Okay.
10 Well I think we can just share it for now
11 and then we can put it in there. If not, then if we
12 need to, we can do it.

13 VIDEOGRAPHER: Okay.

14 I mean, I already have it dragged in.

15 ATTORNEY TRYON: Great. It doesn't take
16 long at all. Great.

17 BY ATTORNEY TRYON:

18 Q. So have you ever seen this article before?

19 A. I haven't. Can you enlarge it a little bit?
20 And what year was this at the top?

21 Q. It looks like 2008.

22 A. Thank you.

23 ATTORNEY VEROFF: If you give the witness
24 a minute if she wants to scroll and get a sense of what

1 this is.

2 BY ATTORNEY TRYON:

3 Q. Well, before I ask you any questions about this
4 let me just ask you some questions overall. Would you
5 agree that fairness in sports is an important value?

6 A. Yes.

7 ATTORNEY VEROFF: Objection.

8 BY ATTORNEY TRYON:

9 Q. And have you done any research on the issue of
10 fairness and sports?

11 A. No. I'm just hesitating because we have
12 included measures of sportspersonship, being a good
13 sport. So if you include that then, yes. But in
14 general, just fairness, I would say no.

15 Q. Okay.

16 Have you read any papers that specifically
17 focus on fairness in sports?

18 A. You know, probably, but I couldn't name them.

19 Q. Okay.

20 Let's go down to --- I really only have one
21 question here, which we'll look at and then if you want
22 to review more of the article you are certainly welcome
23 to do that. But if you go to what is labeled as page 97
24 at the top.

1 A. Could I just read the abstract first? Do you
2 mind?

3 Q. Yes.

4 VIDEOGRAPHER: If you need that made
5 bigger, let me know.

6 THE WITNESS: Maybe one more notch up.
7 Thank you.

8 VIDEOGRAPHER: You're welcome.

9 THE WITNESS: Okay.

10 BY ATTORNEY TRYON:

11 Q. If you turn to 97, and the third full paragraph
12 on that page it says an organizational climate embracing
13 fairness is a critical factor influencing student
14 athletes' attitude towards the sport they participate in
15 and their desire to continue participation. Do you
16 agree with that statement?

17 ATTORNEY VEROFF: I will just remind the
18 witness if she would find it helpful to read more
19 context around that statement before you answer, you're
20 welcome to do so.

21 THE WITNESS: Yes, I think it would be
22 helpful to look at how they measure fairness and, you
23 know, the methods used in the study, but in general I
24 can imagine that, yeah, that this is true.

1 BY ATTORNEY TRYON:

2 Q. Okay.

3 You don't --- just as a general statement you
4 don't disagree with it?

5 A. Right.

6 Q. So I'm not going to ask you about any of their
7 results or anything else, I just wanted to get your
8 reaction on that statement. And you are not offering
9 any expert opinion on fairness in sports.

10 Right?

11 A. That's right.

12 Q. Are you offering an expert opinion on whether or
13 not HB-3293 is fair?

14 A. I'm --- I believe that the sport organizations
15 at every level really value being inclusive and it would
16 be harmful to exclude athletes where they wouldn't have
17 an opportunity to reap the benefits of sport.

18 Q. And there are a lot of things that go into
19 fairness, right?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: Yes.

22 BY ATTORNEY TRYON:

23 Q. And it requires balancing of interests of
24 various people and groups and values; right?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: Yes.

3 BY ATTORNEY TRYON:

4 Q. You have not attempted to do that balancing in
5 connection with HB-3293, have you?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: Yeah, I think my expertise
8 is to weigh in on all the benefits that athletes would
9 not have an opportunity to reap if they weren't able to
10 participate. But I think there are people who know a
11 whole lot more more with any sport about how to keep
12 making the rules fair for everyone.

13 BY ATTORNEY TRYON:

14 Q. Okay.

15 But just to be clear you have not attempted to
16 do that balancing with HB-3293?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: I'm not sure I understand
19 the question.

20 BY ATTORNEY TRYON:

21 Q. Okay.

22 Let me try again. We established that fairness
23 depends on balancing a lot of interests and views of
24 different groups, different people, right?

1 A. Yes.

2 ATTORNEY VEROFF: Objection.

3 BY ATTORNEY TRYON:

4 Q. And that balancing, you have not attempted to do
5 with respect to 32 --- HB-3293.

6 Correct?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: I think it would be unfair
9 to categorically exclude a group of athletes from having
10 the opportunity to participate. So I'm not sure if that
11 --- if you interpret that as balancing or not balancing.

12 BY ATTORNEY TRYON:

13 Q. Have you balanced the interests --- have you
14 looked at the interests of other people in that decision
15 that went into 32, HB-3293?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Yes, I think this House
18 Bill is not fair to transfemale athletes.

19 BY ATTORNEY TRYON:

20 Q. Okay.

21 We will move onto that in little bit then.
22 What is your qualifications to determine fairness?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: I think I was called to be

1 an expert witness in this case to speak to the many
2 benefits that come from participating in sports. And so
3 from my experience as an athlete and a coach and a
4 scholar in this area I think I have, you know, insight
5 and can speak to the many benefits and how we should do
6 all we can to prevent --- or all we can to not exclude
7 athletes from having the opportunity to participate.

8 BY ATTORNEY TRYON:

9 Q. You said you are a tennis player, right?

10 A. Yes.

11 Q. When is the last time you played tennis?

12 A. I --- there's a wall right outside my office,
13 and so I hit on a backboard. I haven't played a match
14 in a little while. I'm not sure the last time was.

15 Q. And when you played --- the most recent time you
16 played competitively, was that in a league or how does
17 that work?

18 A. I haven't played leagues in a while. It was
19 just for fun. I'd play with a couple of my friends,
20 when we go to conferences, we bring our racquets and we
21 get together and play. I've moved into, you know, other
22 exercise forms now and I swim and hike and so on.

23 Q. And so when you were playing tennis, team, is
24 that what it was, on a team?

1 A. Uh-huh (yes), yes.

2 Q. What team was that?

3 A. I played USTA leagues. Those are for adults.
4 And after college, you know, there is just like a
5 circuit in Texas that you can sign up for tournaments
6 all around the State and play and go for ranking.

7 Q. But in college you played, right?

8 A. Yes.

9 Q. And was that on a girls team or a mixed team or
10 what? I don't know much about tennis so I'm just trying
11 to understand that.

12 A. Okay.

13 There was a men's and women's team. We had a
14 head coach for both and assistant. Maybe in the last
15 year there were separate head coaches, but we worked out
16 together. We traveled to tournaments together. When
17 you add up the score you got to --- you got to --- the
18 women had a score and the men had a score, so it wasn't
19 a total team win like that.

20 Q. Okay.

21 So if you're on the women's team and you go up
22 against some other team and they just said we're going
23 to have boys, we're going to have men participate in the
24 women's team against you, you wouldn't have thought that

1 was fair, right?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: Well, I'm assuming you mean
4 transfemales playing and ---?

5 BY ATTORNEY TRYON:

6 Q. I do not mean that. I meant exactly what I
7 said. If you go to compete against another team and
8 that team says we have two men, biological men, and they
9 are going to compete against you, you would have said
10 that is not fair, right?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I would have said --- sorry.

13 ATTORNEY VEROFF: That is all right.

14 THE WITNESS: I think I would have said
15 what are the rules, right. And if the rules are that
16 somebody could play, then I would say bring them on,
17 right. And if the rules are that they can't play, then
18 I'd say, yeah, we probably shouldn't do it that way
19 until the rules change, right.

20 BY ATTORNEY TRYON:

21 Q. So whatever the rules are by definition are
22 fair, right?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: No, I didn't say that. I'm

1 sorry, Julie.

2 ATTORNEY VEROFF: No, that's quite all
3 right.

4 THE WITNESS: I didn't say the rules are
5 always fair, but I think we have to start somewhere and
6 we have to acknowledge them and respect them.

7 BY ATTORNEY TRYON:

8 Q. Well, if they said we are going to have these
9 men compete against you and they just changed the rules
10 on you, wouldn't you object to the rules being changed?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: Yeah. You know, in the
13 context of what is taking place that seems not like a
14 very realistic example in my mind. So I'm not sure I'm
15 thinking about it.

16 BY ATTORNEY TRYON:

17 Q. So you don't want to answer my question?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: Yeah, I think it's --- I
20 think what we are talking about is just more
21 complicated, right, and it is not just --- if we are
22 talking about transfemale athletes, I think we are
23 talking about a different ball game than you are.

24 BY ATTORNEY TRYON:

1 Q. Yeah. Well, I was not talking about them, at
2 least not yet. I'm just asking if suddenly men are
3 allowed to compete against women in tennis, whether or
4 not they identify as female, do you think that would be
5 fair to the women?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: Again, I would just go back
8 to the rules. But just in general, that if I decide
9 today, hey, I will go --- we have a really weak men's
10 tennis team, so today I think I'll go play on the males
11 tennis team, yeah, I don't think that would be right,
12 right, that I could switchover to win. Right. The
13 point is can people be their genuine, authenticate self
14 and play with a gender identity that they have.

15 BY ATTORNEY TRYON:

16 Q. So I mean you're answering your own question
17 your own way, but so that's fine, but you have also said
18 that you think HB-3293, which sets a rule, you think
19 that rule is unfair, right?

20 A. Yes, I do.

21 ATTORNEY VEROFF: Objection.

22 BY ATTORNEY TRYON:

23 Q. But the legislature balanced a lot of different
24 interests in making that rule, right?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: I don't know. I don't know
3 that that is true.

4 BY ATTORNEY TRYON:

5 Q. You don't know one way or the other what
6 interests they balanced, right?

7 A. I don't know what their ---.

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: --- I don't know what their
10 knowledge base is or their real involvement. I don't
11 know if they've taken a close look. It looks like in
12 this situation, that PBJ (sic), that people close to it
13 are saying, hey, let's let this child play, right, and,
14 you know, the world is not going to end and kids can
15 have good experiences and we can --- we can go. So
16 yeah, I can't speak to what the legislators have --- the
17 background they've done or their mindset.

18 BY ATTORNEY TRYON:

19 Q. Do you think that the legislation, this
20 legislation should be tailored to each individual?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: No, no. I think the sport
23 organizations at every level, from the Olympic Committee
24 to the NCAA, all of them are saying we really value

1 being inclusive and let's do all we can to, you know,
2 balance these things and make things fair but also being
3 inclusive and not totally excluding a group of athletes.

4 BY ATTORNEY TRYON:

5 Q. So what would be the rule that you would set up
6 for high school for transgender people --- let me
7 rephrase that. What would be the rule that you would
8 set up in high school sports for a male who expresses
9 that he is now identifying as female should be allowed
10 to participate in girls sports?

11 ATTORNEY VEROFF: Objection. Go ahead.

12 THE WITNESS: Yeah, I think we should
13 rely on the experts and the medical doctors and the
14 exercise physiologists who really study this and can
15 say, hey, across these sports this is --- seems to
16 create a fair playing ground. I think, you know, it
17 sounds like our local weatherman, we have incoming data,
18 right, but this is relatively new in the sport world and
19 I think all of these researchers are gathering more data
20 all the time that is going to help inform these
21 decisions moving forward on how we create it. So you
22 know, I'm not an expert to say, hey, what would those
23 exact guidelines be, but just to have a blanket
24 exclusion of all we set the stakes to do a lot of harm,

1 and BPJ would be a recipient of that harm in my opinion.

2 BY ATTORNEY TRYON:

3 Q. So we should rely on experts about safety for
4 one thing, right?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: Yes.

7 BY ATTORNEY TRYON:

8 Q. And we should also rely upon experts in
9 performance, right?

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: Yes.

12 BY ATTORNEY TRYON:

13 Q. So you keep focusing on BPJ, so if we are going
14 to focus on each individual, we have to have in each
15 sport an example of someone who is a male identifying as
16 a female has to be individually evaluated to determine
17 whether that person should be allowed to participate in
18 whatever sport that person wants to be in?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: No, I didn't say that. And
21 it may be just we could have general guidelines at the
22 high school level. I'm just saying I'm not --- that is
23 not my expertise as on the performance and exercise
24 physiology of it all to think what would be fair. I

1 think as we branch up and get to more elite levels, then
2 that seems to be the direction that NCAA is going, that,
3 hey, let's pull in these national governing bodies
4 across the sport because they know the sport the best
5 and are in the best position to maybe offer those
6 guidelines.

7 BY ATTORNEY TRYON:

8 Q. Do you have an opinion about other --- well, we
9 will get to that later. Let's go back to your report
10 and if we could go to after paragraph 17. Well, that
11 doesn't seem right. There we go. Okay. The title of
12 this section on top of page five it says Focusing Solely
13 on Performance Outcomes Undermines the Benefits of Sport
14 for Youth and Young Adult Athletes. Do you see that?

15 A. Yes.

16 Q. Are you aware of any middle schools, elementary
17 schools or high schools that focus primarily on
18 outcomes?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: No.

21 BY ATTORNEY TRYON:

22 Q. Are you aware of any surveys or studies of
23 middle schools or high schools that find out if there
24 are any schools that focus solely on performance

1 outcomes?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: I would just say that it
4 depends what we mean by solely focus on performance
5 outcomes. I think there are coaches out there that
6 absolutely that is their primary thing and they care
7 less about the hollistic, you know, wellness and just
8 the overall experience of their kids and they are just
9 trying to put the team together that is going to give
10 them the best chance to win.

11 BY ATTORNEY TRYON:

12 Q. What coaches are you aware of in high school
13 that do that?

14 A. Just in my experience across years. I see --- I
15 see coaches that are very focused on winning that use a
16 lot of punishment for mistakes and that seems to be what
17 drives them.

18 Q. And so you believe there are coaches out there
19 that focus solely on performance outcomes for youth and
20 young adult athletes?

21 A. Yes, it just seems like a weird way to talk
22 about it, that I'm not sure when --- I mean to put a
23 percentage, if you're asking that, so are there coaches
24 that 100 percent they're just focused on winning and

1 winning only, I'm not sure. I think there are probably
2 coaches out there that are.

3 Q. Sorry. Go ahead.

4 A. Yeah, probably most, you know, it's not a
5 100 percent, but when we say primary that that's what's
6 really driving the boat for them. I think there are
7 coaches out there.

8 Q. Well, you didn't say primary. You said solely.
9 Those are your words, right?

10 A. Right.

11 ATTORNEY VEROFF: Objection.

12 BY ATTORNEY TRYON:

13 Q. Do you now want to modify that in your opinion?

14 ATTORNEY VEROFF: I'm sorry, objection.

15 THE WITNESS: Sorry. I'm just going back
16 to this wording that you're talking about. Are you
17 saying ---?

18 BY ATTORNEY TRYON:

19 Q. At the heading. Right about paragraph 18.

20 A. Sorry. I was looking underneath. Yeah, I mean
21 it in the sense that that seems to be what all the
22 discussion is about, that all were focused on just this
23 isn't fair in terms of performance, and I'm saying that
24 is missing a bigger picture of what youth sport can be.

1 Q. What discussion is that? You said that
2 discussions all about it. What discussions are you
3 talking about?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: The idea that it's not fair
6 for transathletes to participate, right. And the only
7 reason that we have any concern about this is from the
8 performance issue. So in this case, I'm just saying if
9 we think about BPJ and her being excluded from having
10 the opportunity to play a sport, there's a lot at stake
11 there as well as the other side is saying, hey, is this
12 fair in terms of performance for athletes, right. That
13 is what I meant by this.

14 BY ATTORNEY TRYON:

15 Q. So who is --- but you're not aware of any
16 schools or colleges that have a policy of focusing
17 solely on performance outcomes, right?

18 A. Right.

19 Q. But you think the statute, HB-3293 solely
20 focuses on performance outcomes?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: I'm not sure what leads me
23 to say that, but I think the statute excludes a group of
24 athletes and that that would be unfortunate that they

1 wouldn't have a chance to just reap these benefits that
2 can come from being a sports team.

3 BY ATTORNEY TRYON:

4 Q. So you are not saying that you believe that
5 HB-3293 focuses solely on performance outcomes, right?

6 A. Okay. I'm not saying that. I think performance
7 outcomes is --- seems to be a piece in it.

8 Q. Is that an appropriate piece to consider?

9 ATTORNEY VEROFF: Objection.

10 BY ATTORNEY TRYON:

11 Q. Let me rephrase that. Is performance outcomes
12 something that's an appropriate thing for a legislature
13 or a school to focus on?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: Yes.

16 BY ATTORNEY TRYON:

17 Q. Now, in paragraph 18 itself, you say, the second
18 sentence, a myopic focus on winning in youth and young
19 adult athletes ignore the other important benefits that
20 school athletics offers young athletes such as teamwork
21 and camaraderie which all advance when all athletes have
22 the opportunity to play the sports they love and reap
23 the benefits of such participation. Do you see that?

24 A. Yes.

1 Q. When you say a myopic focus, you're not
2 excluding an appropriate level of focus on winning.
3 Right?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: That's right.

6 BY ATTORNEY TRYON:

7 Q. Is there a reasonable variance of opinions in
8 the sporting world --- sports world on what exactly the
9 proper focus on winning ought to be versus the other
10 benefits?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: Yes, I think there is an
13 agreement within our field of sport exercise psychology
14 that at the youth sport level the focus should be on
15 giving as many kids as possible a chance to participate
16 in youth support, right. And then as athletes move up
17 the levels, that there is more emphasis and importance
18 placed on winning.

19 BY ATTORNEY TRYON:

20 Q. What do you mean by that, as athletes move up
21 the levels?

22 A. That typically there's a greater focus in high
23 school than middle school, greater focus in middle
24 school than elementary school, not that they have

1 organized sports within their schools, but just compare
2 that to Little League, that as you move up to college,
3 the emphasis on winning may increase and so on.

4 Q. Thank you. Would you agree with me that there
5 is nothing in HB-3293 that says there should be a sole
6 or myopic focus on winning in any of the sports it
7 covers?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: Yes, I would agree.

10 BY ATTORNEY TRYON:

11 Q. And the law doesn't say anything anywhere that
12 there are not other benefits to sports other than
13 winning. Right?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: Right.

16 ATTORNEY VEROFF: I think if we are going
17 to have any questions about what the law says we should
18 put it back up on the screen.

19 ATTORNEY TRYON: I don't have any more
20 questions on that.

21 ATTORNEY VEROFF: Thank you.

22 BY ATTORNEY TRYON:

23 Q. Let's look at paragraph 21 in your report. You
24 say there are many benefits to young people from

1 participating in athletic activities discussed further
2 herein. Do you see that?

3 A. Yes.

4 Q. Is it possible that some young people are
5 actually harmed by participation in athletic activities?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: Yes, I think so.

8 BY ATTORNEY TRYON:

9 Q. What are some of those possible harms?

10 A. Some of those harms might be they have abusive
11 coaches that push them too hard physically, that you
12 know, don't treat them in a developmentally appropriate
13 way, that there --- coaches allow like bullying to go
14 on, that kids are made to feel shame if they don't
15 perform well. Those kind of things.

16 Q. Outside the coaching, you mentioned bullying.
17 So in sports that happens, right, some athletes bully
18 other athletes, right?

19 A. It happens sometimes.

20 Q. And that can have long-term lasting negative
21 impacts, right?

22 A. Yes.

23 Q. Are you aware that sometimes those who are
24 athletes also belittle those who are not?

1 A. Yes, I'm aware of that.

2 Q. Let's move onto paragraph number 23. In
3 paragraph 23 you talked about achievement goal
4 perspective theory, right?

5 A. Yes.

6 Q. Does this theory apply to outside sports, say
7 for example, to academics?

8 A. Yes, John Nicholls actually started there in
9 classroom research.

10 Q. So goal perspective theory is about goals,
11 right?

12 A. Yes.

13 Q. And how to set goals and how to reach goals?

14 A. Not exactly. I would use sort of another area
15 of goal setting, but goal perspective theory is more
16 about what is our --- how do we define success and how
17 are we kind of valuing what is important in life. Some
18 people think of goal perspective is how we set goals,
19 right, that they need to be specific measurable. That
20 is sort of another part of the literature. And instead,
21 Nicholls is just thinking how to understand people's
22 perspective on what they are trying to get out of
23 things, right. And if you have this task goal
24 perspectives that you are moving through life thinking

1 how can I just give it my best and be the best that I
2 can be. And if you are moving through life with an ego
3 perspective, you are thinking, hey, how can I
4 demonstrate my competent --- my competence and show
5 other people I'm better.

6 Q. And that happens in all aspects of life, right,
7 not just in academics?

8 A. Yes, it's a pretty relevant theory.

9 Q. You probably see it in faculty lounges and
10 college boards and you will certainly see it lots of
11 places in academia, right?

12 A. Right, academia from I'm guessing law firms and
13 probably everywhere we go in the world.

14 Q. You bet. Absolutely you see it in law firms and
15 pretty much every place, I agree with you.

16 Let me look at paragraph 24 with you. You say
17 first is the developmental component of achievement goal
18 perspective theory. Young children are incapable of
19 accurately comparing their ability to others,
20 overestimate their ability and are naturally focused on
21 their effort as a marker of success. So I'm not saying
22 that's wrong, but I don't see a source for that. Do you
23 have a source for that statement?

24 A. I do. Nicholls 1989 and my dissertation. I

1 apologize for missing that.

2 Q. Your dissertation?

3 A. Yes, I did a --- this was my line of work.
4 Early in my career I did a series of three studies kind
5 of tapping into those, how children gain an
6 understanding of the concepts of effort, luck and
7 ability.

8 Q. They gain an understanding of concepts of
9 effort, of luck and ability. Is that what you said?

10 A. Yes.

11 Q. What does that mean, luck and ability?

12 A. So when kids are really little those --- they
13 don't clearly distinguish these. So they just think,
14 hey, whoever tries hardest, they are going to do the
15 best, right, and they don't recognize ability in the
16 same way that we do as we mature over time and that we
17 understand, hey, gosh, you could run circles around me
18 today, you were a much better, faster or stronger runner
19 than I am, for example, right. And that doesn't mean
20 that I can't try harder to improve but our ability
21 levels are really different today.

22 So in these studies we set up scenarios and we
23 show kids, and so there's kind of a contrast. Somebody
24 didn't try hard at all actually outperformed somebody

1 who seems to be focused and concentrating, and we say,
2 you know, what do we think is happening here. And so
3 these concepts are just really blurred and kids are
4 saying yeah, you know, this person is definitely trying
5 harder. I don't know why they didn't perform very well.
6 This person looks like they are not trying hard. But if
7 they both do it again and they try hard then I think
8 they will get the same score. So just this wide variety
9 of scenarios. Kids don't distinguish like luck and
10 ability. So you know, if you're around little kids, you
11 know, they like games like Chutes and Ladders or
12 Candyland. Those are a hundred percent luck games,
13 right. There's no ---.

14 Q. Now I understand. I thought you said lock,
15 L-O-C-K. You are saying luck, L-U-C-K?

16 A. Right, right.

17 Q. Thank you. I didn't mean to have you go on with
18 that long explanation when I just misunderstood your one
19 word. But thank you for that explanation. That helps
20 me understand what you're saying here.

21 So my --- then I'm just interested in what is it
22 that at some point little kids somehow realize that they
23 have overestimated their ability, is that something that
24 just naturally happens or is it something that other

1 people have to point out for them for them to realize
2 it, whether it be teachers or coaches or just the kids
3 around them?

4 A. Okay.

5 So just a quick example. Nicholls would put a
6 list of faces, you know, like generic smiley faces 1 to
7 30 and you go in with a class of five-year-olds and you
8 interview them one at a time. And you say, okay, this
9 is everybody in your class and they are listed by how
10 good a reader they are, right. And so this person is
11 the very best in your class, right, this person is just
12 the worst reader, this person is the middle. Which one
13 is you? And the mean for kids in kindergarten is like
14 three, which tells us they're all saying well, that's me
15 up there, high, right, I'm the best reader in the class.
16 But as you move through those elementary school years,
17 the mean shifts to like 15 by the time they're say in
18 sixth grade, because when you ask six graders, all
19 right, here's everybody in your class, where do you fit
20 in, they are much more accurate. And when they ask the
21 teachers, there's no correlation, right, with younger
22 kids, because they are all over the place. But by the
23 time you get to the upper elementary grades it
24 correlates highly with what the teachers are saying in

1 terms of the kids' reading ability. And Nicholls said
2 this is so key because it makes Middle School a very key
3 developmental period as kids are gaining this
4 understanding all of a sudden now there is a reason to
5 try your hardest or withdraw effort because you don't
6 want to look silly. You know that other people might be
7 more skilled than you. And that's why he was so
8 passionate about this theory. Even though we are
9 capable of looking at the world that way, we all can
10 choose to just stay focused on our effort and ability
11 and being the best that we can be.

12 Q. So there are people that --- sorry.

13 A. That is the other piece of the climate, how do
14 we train teachers and coaches to create that
15 environment. That tells people keep that task
16 involvement going.

17 Q. And there are people that continue to
18 overestimate their abilities throughout life, right?

19 A. Yes.

20 Q. And that is exacerbated if those people are
21 never corrected to let them know in some way that their
22 abilities are not what they think they are, right?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Yeah, I'd say our bigger

1 issue within education is not that kids are
2 overestimating but they're --- you know, don't have as
3 high self-esteem or confidence and those type of things.
4 But are there people out there that could be
5 overestimating? Absolutely.

6 BY ATTORNEY TRYON:

7 Q. So Nicholls did the study of academic. Did he
8 do any study athletically?

9 A. That's where I picked it up and looked in the
10 physical domain and made scenario specific to physical
11 activity and conducted these three studies that looked
12 at effort and luck and ability with kids aged 5 to 12
13 and sort of replicated his work, and we found that kids
14 move through these same levels of understanding in the
15 physical domain where things are a little bit more
16 obvious for us to see, right. If we're sitting here
17 working on math problems we not be able --- it might not
18 be as evident that, hey, somebody is moving through
19 these and they are stronger, right. But in the physical
20 domain, when we see each other and move and we can see
21 each other's skill levels, in some of these things move
22 a tiny bit faster but it was the same sort of stages of
23 development, if you will.

24 Q. Is your dissertation cited in your bibliography?

1 A. No, it is not.

2 Q. Is it in your list of publications?

3 A. It's in my Vitae.

4 Q. You have a lot of publications. Can you direct
5 me to it?

6 A. You're going to go back a ways. Okay. So the
7 dissertation study is on 1997, it's on page six. Fry
8 and Duda.

9 Q. I see Fry and Duda, 1997.

10 A. Yes, those are my dissertation studies. And I
11 followed it up with two studies at the top of that page,
12 Fry 2000. There are two different studies.

13 Q. Okay.

14 Let me move on to paragraph 25 of your report.
15 I just goofed on my --- there we go. I lost all the
16 pictures, so I couldn't see you anymore. Just one of
17 the hazards of technology. Okay. So I'm looking at
18 paragraph 25 and you talk about task. Here you talk
19 about goal --- primary goal orientations are task and
20 ego orientation, right?

21 A. Yes.

22 Q. So you're not saying --- I think you've said
23 this before, but I just want to make sure I understand.
24 You're not saying that ego orientation is bad from an

1 individual basis, are you? It just kind of sounds like
2 it's a pejorative. You don't mean it that way, do you?

3 A. I think it depends on what your aim is and if
4 you have --- if you want athletes to have fun and try
5 hard and have good relationships and, you know, feel
6 good about themselves, have confidence, have empathy for
7 others, things like that, then it's not something we
8 would want to promote is the orientation because across
9 a wide body of literature those just don't lead to what
10 we call adaptive outcomes, right.

11 On the other hand, many elite athletes are high
12 in task and ego orientation, right. And the big deal
13 here is that people really need that high task
14 orientation to sustain motivation over time with the ups
15 and downs and overcoming injuries, with all of that, but
16 ego orientation isn't necessarily a bad thing in this
17 case. But it probably isn't great if you don't have
18 that high task orientation to go with it.

19 Q. So let's move on to paragraph 26. Okay. So in
20 the last sentence, I think it is the next to last
21 sentence. Okay. The sentence that starts when the
22 environment created by coaches and others is a caring
23 environment, do you see that part?

24 A. Yes.

1 Q. It continues, athletes are more likely to
2 perceive the overall climate as task-involving. A
3 caring environment is one where athletes feel safe,
4 welcome, comfortable and valued and are treated with
5 kindness and respect by all in the sports setting. You
6 wrote that, right?

7 A. Yes.

8 Q. And that means a caring environment for all
9 athletes, right?

10 A. Yes.

11 Q. And a caring environment also requires rules?

12 A. Yes.

13 Q. A caring environment still includes the coach
14 --- let me rephrase that. A caring environment still
15 includes the coach and officials and requires them to
16 make calls that make --- that some athletes don't like
17 and may even get upset, right?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: Right.

20 BY ATTORNEY TRYON:

21 Q. So how do you square that with a caring
22 environment when the rules are going to make some
23 athletes unhappy?

24 A. So this is about coaches kind of saying, yes, I

1 want to be intentional and I want to do everything I can
2 to create this environment that is going to help bring
3 out the best in my athletes, right, and I don't have
4 total control over what my athletes perceive. I'm just
5 going to do what I can to promote these features that
6 are in the last sentence. I'm also going to get
7 athletes, trying to get them to buy in so that they see
8 how valuable this is if we create this caring
9 task-involving climate. It doesn't in any way mean, you
10 know, we're not going to get a bad call or things aren't
11 going to happen, things don't go our way, somebody
12 starts before I do. Right. All kinds of things. Those
13 are just part of sports, right, but this refers to the
14 coaches buying into this truckload of research that we
15 have that shows how we can help all athletes have a good
16 experience.

17 Q. You're not advocating for laws requiring a task
18 oriented environment, are you?

19 A. No. That would be tempting. No. We're just
20 saying if our goal is to help athletes reach their
21 potential, then we have a lot of scholarship to guide
22 --- to guide what we do. We know a lot about how to
23 make that happen.

24 Q. Do you think coaches are unfair if they don't

1 adopt a task oriented approach?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: I think they do a lot of
4 harm, right, and they set athletes up to experience all
5 these negative aspects, right, and they don't have fun
6 and they don't try as hard. They don't have as good a
7 relationship, they experience shame. And all of that
8 stuff just means that a lot of kids aren't going to
9 stick with it and we are going to lose a lot. And that
10 just has long-term implications for people living
11 physically active lives, right. When you have bad
12 experiences, you know, a lot of people are running back
13 out there to keep participating.

14 BY ATTORNEY TRYON:

15 Q. Well, officials make calls all the time that
16 upset athletes. Athletes think they're unfair or
17 they're wrong. You're a tennis player. You remember
18 John McEnroe?

19 A. I do.

20 Q. He yelled all the time. All the time is an
21 exaggeration. He frequently claimed the calls the
22 officials made were unfair, right?

23 A. Yes.

24 Q. Do you think that the umpires should have

1 changed their calls to satisfy him in order to provide a
2 more caring environment for him?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: I think they should have
5 taken him out of a few tournaments and I feel like that
6 would have nipped it in the bud. But with respect to a
7 caring and task-involving climate, what you're trying to
8 say is we are trying to treat everyone with kindness and
9 respect and we're going to understand that officials are
10 out there trying to do the best they can, and they're
11 going to make mistakes just like all of us make
12 mistakes. And so the goal would be for us to be
13 respectful. And if we feel like bad calls are made we
14 would deal with it in a respectful way, right, but we
15 don't deal with it like Will Smith did, right, like when
16 he --- we're trying to learn to control our emotions,
17 right, and wow, it just makes sport a powerful arena
18 when athletes can learn those terms.

19 BY ATTORNEY TRYON:

20 Q. Right. I understand that. And I'm just asking,
21 so you got rules, you got calls by higher powers and you
22 got to live by those rules. And if you think they're
23 unfair then you should ask them to have them changed,
24 right?

1 A. Yes.

2 Q. But it is still a caring environment and just
3 because you think it is unfair to you in particular
4 doesn't make it uncaring.

5 Is that a fair statement?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: You know, the way research
8 is done is you're asking every athlete on the team to
9 fill out a survey, right. So it doesn't mean that there
10 is a 100 percent agreement, right. I may feel like the
11 coach isn't fair, hasn't given me a fair shot, right,
12 and somebody else may not feel that way. But in
13 general, there's sort of a consensus on most teams, you
14 know, that people are seeing it more similarly.

15 BY ATTORNEY TRYON:

16 Q. Yes, I guess I'm just asking specifically about
17 rules. Rules by their very nature, they are not caring,
18 they don't care about individuals. They are just set
19 there and you need to follow them, right?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: Yeah. Hopefully they have
22 been established in a caring way, thinking about what is
23 best for athletes, but there is just so many things
24 across sports that are not necessarily fair, right, and

1 so we just kind of have to keep the focus on the rules.
2 I had an athlete tell me that his teammate has been
3 diagnosed with MS and that doesn't seem very fair,
4 right, that a young person has to go through that, but
5 I'm glad that they are part of a caring and
6 task-involving team where they want this athlete to
7 continue to be part of the team, right. And in more of
8 an ego involving team, we might just say, hey, sorry,
9 you are really going to impair our ability to win.
10 That's our focus, that's why we are here, so you know,
11 have a good life, right. And I mean, what's happening
12 is they are just working with this athlete to still be a
13 vital part of the team.

14 BY ATTORNEY TRYON:

15 Q. Do you think you need to be an athlete to have a
16 fulfilling life?

17 A. No.

18 Q. I'm glad to hear you say that because I'm not
19 much of an athlete.

20 ATTORNEY TRYON: Well, if people want to
21 break for lunch now, I'm okay with that. I can take a
22 break now or we can keep on going. Whatever Dr. Fry ---
23 Professor Fry, whatever your preference is and other
24 counsel?

1 BY ATTORNEY TRYON:

2 Q. Okay.

3 Let's go back to paragraph 30 of your report.
4 It says athletes high in task orientation also report
5 greater confidence and perceived ability and task
6 orientation has been correlated with both self and team
7 efficacy and greater perceived confidence ---
8 competence, excuse me. You are saying greater
9 confidence and perceived ability. Perceived ability is
10 different than reality, isn't it?

11 A. Yes.

12 Q. Are you saying that is a good thing?

13 A. In the psychology world it is pretty well
14 accepted that perceptions are very important. So yeah,
15 you are right in identifying that this is athletes'
16 perceptions of their ability. And so athletes who have
17 a high task orientation in turn, you know, seem to have
18 more confidence and believe that they have higher
19 ability.

20 Q. And then in paragraph 31 you say, by contrast,
21 ego orientation, i.e. the non-pejorative descriptive
22 term for defining success based on ability and
23 performance outcomes is not correlated with perceived
24 ability in general confidence of athletes high in ego

1 orientation was more of based on their perception of
2 ability and having a strong physical presence. But in
3 that first sentence it indicates --- it suggests that
4 ego orientation is based on actual reality --- excuse,
5 actual ability rather than perceived ability. Do I
6 understand that indication correctly?

7 A. Where do you see that it is on actual ability?

8 Q. Okay.

9 Let me start that over. So in the sentence it
10 says, by contrast, ego orientation i.e. the
11 non-pejorative descriptive term for defining success
12 based on ability and performance outcomes is not
13 correlated with perceived ability in general. Does that
14 mean it's correlated with actual ability rather than
15 perceived ability?

16 A. Okay. I understand. No. No, what it means is
17 that if you're --- if you're somebody who's high in task
18 orientation, then you're feeling successful when you
19 give your best effort, when you see improvement, right.
20 Those are things we have more control over. And so when
21 you're focused that way you tend to have higher
22 perceptions of ability, right, because that is your
23 focus. If you are high in ego orientation, right, and
24 so I'm feeling successful if I out perform others, if I

1 win, if I demonstrate competence, right, to a greater
2 degree than other people, right, so if that doesn't
3 happen but that is how I judge success, then chances are
4 my perceptions of ability are going to be lower.

5 If I'm the star on the team and I judge success
6 based on how I compare to others, then I probably get a
7 lot of kudos and get reenforced for that. So that's why
8 we will guess there is no correlation there in the way
9 there is task, right. And that is why Nicholls was most
10 concerned about people high in ego orientation who had
11 lower perceptions of ability, because it makes us
12 vulnerable. That's why I'm so focused and care about
13 I'm not --- you know I'm not as good. Does that make
14 sense?

15 Q. I'm processing it. I still want to understand
16 it a little better. In paragraph 30, athletes high in
17 task orientation also report greater confidence in
18 perceived ability. Am I right that perceived ability is
19 not actual ability?

20 A. Right, it's not. Items would just tap into I
21 would be responding to a question like I'm really good
22 at basketball or something, I'm very skilled in
23 basketball or I'm not very skilled and I would be
24 answering it on a quantitative scale, so it would be my

1 perception of it.

2 Q. Isn't it important that athletes understand
3 their actual ability rather than just their perceived
4 ability?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: I think it's important for
7 coaches to share with athletes where they are and what
8 they can do to keep improving. I'm not sure it's super
9 beneficial that we need to go around and tell athletes,
10 hey, you're not very good, this person is better than
11 you, right, those are just kind of distractions, but
12 helping people see where they are and what they can do
13 to improve, yeah, would seem valuable.

14 BY ATTORNEY TRYON:

15 Q. In order for an athlete to improve doesn't the
16 athlete need to understand where he or she is rather
17 than just where he or she perceives him or herself to
18 be?

19 A. Yes, we get into kind of --- are we talking like
20 morbid ability, right, or --- and so in that sense do I
21 need to tell --- I've got five athletes here. Do I need
22 to make sure they all know where they rank between one
23 and five, right, in my mine who's the best? Or do I
24 just need to take each athlete aside, right, and make

1 sure that they understand here's some areas you could
2 really improve on, and I care less about even having a
3 conversation about who's the best right now, right, that
4 this person is better than this person, right, it's
5 moot. And that's where Nicholls was coming from. What
6 if we as coaches did more just to focus people on,
7 right, on what they could do to keep improving?

8 Q. And athletics it is certainly obvious, though,
9 what your athletic ability is at least as far things
10 involving racing times, for example, you get your times
11 so you know what your ability is as compared to yourself
12 or as compared to other people, right?

13 A. Right. I think there is just a lot in sport
14 that's giving us feedback of how we compare to others.
15 And also when we see these times it's --- that's
16 information that we can track how we're improving,
17 right, and how we are doing.

18 Q. So why do we share with people --- well, strike
19 that. I will move on.

20 Okay. Paragraph 32, please. Let me know when
21 you see that.

22 A. I see it. Thanks.

23 Q. Athletes high in ego orientation report lower
24 companionship and greater conflict with teammates. For

1 that phrase --- you can go ahead and read the whole
2 sentence if you want, but I want to ask you a question
3 about that phrase or that clause.

4 A. Okay.

5 Q. So for that clause you cite Balaguer in that
6 study, right?

7 A. Yes, Balaguer (corrects pronunciation).

8 Q. Thank you for helping me pronounce that,
9 Balaguer. And is there anything else on which you base
10 that first clause?

11 A. Yes, there are other references. This paragraph
12 in general is just referring to we have better
13 relationships, right, when people are high in task
14 orientation. They're really valuing that aspect of
15 helping each other improve. And in an ego orientation,
16 when, I'm just kind of zoned in on me and me wanting to
17 show that I'm better than my teammates, right, it just
18 sets things up to not having as good a relationship.
19 This doesn't mean that every athlete out there that is
20 high in orientation, it just means there's a tendency
21 that this correlates --- that you're much more likely to
22 see this when people have a high ego orientation.

23 Q. So I'm just --- my question is a little more
24 precise. Thank you for that explanation. But the first

1 clause there you cite only to Balaguer. I'm asking if
2 there are other sources for that contention that
3 athletes high in ego orientation report lower
4 companionship and greater conflict with teammates. And
5 if there are other things, what are those other studies?

6 A. Like Smith and Small found that in youth sport
7 athletes, you know, didn't like their coach as much,
8 didn't think their coach knew as much about the sport,
9 didn't like their teammates as much when they had like
10 high ego orientation.

11 Q. Is there a reason why you didn't cite Smith and
12 Small for that proposition?

13 A. Yes. Yeah, I think it crosses documents. We
14 could have added another, you know, 150 references
15 probably. Tried to keep it more manageable, which it's
16 just consistent, that if that is something that you care
17 about, the quality of relationships, then it doesn't
18 come out often as --- you know, it comes out with the
19 task orientation, not an ego.

20 Q. Well, the reason I'm asking this is I read that
21 Balaguer report, and I did not see anything in there
22 that supported this proposition of this first clause of
23 this sentence. Are you confident that it's in there?

24 A. It would be good for me to review.

1 Q. If I showed you the article would you be able to
2 locate it without too much difficulty?

3 A. I'm not sure. I'd probably just have to review
4 it. But having ---.

5 ATTORNEY TRYON: Well, let's bring it up,
6 and maybe I've just missed it. And so that would be ---
7 the name of it is Motivational Climate and Goal
8 Orientations as Predictors of Perceptions of Improvement
9 Satisfaction in Coach Ratings Among Tennis Players.
10 Educators. So Jake, if you could find that and pull
11 that up.

12 VIDEOGRAPHER: Do you want it marked?

13 ATTORNEY TRYON: Yes. I think we are on
14 8 now, right?

15 VIDEOGRAPHER: I think it's 7, unless I
16 missed something.

17 ATTORNEY TRYON: Well, I will take your
18 word for that.

19 ---

20 (Whereupon, Exhibit 7, Article, was
21 marked for identification.)

22 ---

23 ATTORNEY TRYON: You know what, I should
24 ask you, Jake, go ahead and put that in the chat room so

1 that Professor Fry can download it and look at it real
2 quick.

3 VIDEOGRAPHER: Already did.

4 ATTORNEY TRYON: Great.

5 BY ATTORNEY TRYON:

6 Q. So Professor Fry, you can either look at this
7 with me or it might be best if you just double check in
8 the chat room and then it should download it and you
9 should be able to bring it up and look through there at
10 your --- I don't want to say leisure but how you would
11 prefer to do it.

12 A. Okay. I may have to get help here because it's
13 not appearing on my end.

14 Q. Do you see it in the chat room?

15 A. Yeah, I can click on it, but then it takes me to
16 some case view net thing and it says I need a code and
17 password. I'm using their system, so I'm guessing it's
18 related to that.

19 VIDEOGRAPHER: Not the link. There
20 should be a PDF document you can just click open.

21 THE WITNESS: Okay.

22 VIDEOGRAPHER: I don't know how it is on
23 an iPad, so I will admit I'm at a loss.

24 THE WITNESS: Okay.

1 BY ATTORNEY TRYON:

2 Q. Are you able to look at it now?

3 VIDEOGRAPHER: The document called 007 at
4 the beginning?

5 THE WITNESS: When I click on the chat
6 I'm just seeing one link listed.

7 BY ATTORNEY TRYON:

8 Q. Underneath the link there should be a PDF.

9 A. Okay. It's not showing up for me.

10 Q. Okay.

11 VIDEOGRAPHER: Alternatively, Counsel, I
12 can give remote control of the document to her so that
13 she can scroll on it herself.

14 ATTORNEY TRYON: Let's do that.

15 VIDEOGRAPHER: Okay.

16 THE WITNESS: Thank you.

17 VIDEOGRAPHER: You should have control if
18 you just try to click on the screen and you just scroll
19 it and move it. Perfect.

20 THE WITNESS: Okay.

21 So how do I move the document?

22 VIDEOGRAPHER: So if you would move the
23 cursor like over here and drag it.

24 THE WITNESS: Sorry. Can you say that

1 again?

2 VIDEOGRAPHER: You can control the mouse
3 cursor right now, so you would have to move it over here
4 and just drag it down or click on this down arrow down
5 here?

6 THE WITNESS: So I don't really have a
7 mouse, right, with this. It's just using my finger on
8 the screen.

9 VIDEOGRAPHER: Right. If it works like
10 normal iPad things, then you would --- to click
11 something you would double tap it and then hold, which
12 sounds convoluted.

13 ATTORNEY TRYON: Well, if you have any
14 difficulties with it, why don't we let Jake take control
15 and scroll down with it?

16 THE WITNESS: Okay.

17 I think Dana is outside, if you want me
18 to get her to help real quick to save time.

19 ATTORNEY TRYON: I'll tell you what,
20 let's do this. This is not a critical point for me. I
21 just wanted to try and understand this. So let's come
22 back to this later. All right?

23 THE WITNESS: Okay.

24 ATTORNEY TRYON: We have time.

1 BY ATTORNEY TRYON:

2 Q. In paragraph 32, you talked several times about
3 the climate, right?

4 A. Yes.

5 Q. And in the sentence it says despite the ego
6 involving climates emphasis on the performance outcomes
7 results across studies suggest the benefits of task
8 involving climate may have a direct impact on athletic
9 performance and ultimately improve performance outcomes.
10 So that sentence is talking about the climate, not the
11 individual's orientation, right?

12 A. That's correct.

13 Q. And you say it may have a direct impact. So by
14 may that is not suggesting that it's probable, it is
15 just saying that it might. Is that a fair statement?

16 A. Yes.

17 Q. Then let me move down to paragraph 33.

18 A. Can I just say on that point ---?

19 Q. Yes.

20 A. I think this is an area within our body of
21 research that there is less support for, but the studies
22 that are in place would suggest that perceptions of a
23 task involving climate would lead to greater
24 performance. So there is some evidence for that, but I

1 would agree it's not strong and that is why the wording
2 is softer there, right, but there is no evidence
3 suggesting that perceptions in an ego involving climate
4 would lead to better performance. And so on the one
5 hand people just might be thinking, wow, that's a
6 no-brainer, right, if all you care about performance go
7 with that ego involving climate, but for all these other
8 reasons we would argue it makes sense, right. If people
9 are having more fun and having better relationships and
10 trying hard and so on, that it might lead to better
11 performance.

12 Q. In paragraph 33 you talk about young athletes
13 with a high ego orientation participating in a variety
14 of sports have reported higher traits and state
15 cognitive and somatic anxiety as well as greater
16 concentration dysfunction, maladaptive perfectionism and
17 concern over making mistakes. Now, my question is,
18 isn't that true for basically any endeavor, that there's
19 going to be --- you're going to have anxiety in trying
20 to succeed?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: You know, definitely anxiety
23 and stress is part of sport. With these climates though
24 what we're seeing consistently is that athletes report

1 that when they perform their best they were less
2 bothered by stress and anxiety. In fact, the kind of
3 epitome of being --- what we call being in flow, right,
4 you just --- you feel high confidence, you're
5 concentrating well, you're not worried about
6 distractions, you're not stressed, right. And so
7 consistently people would report a higher ego
8 orientation, they just --- no matter how it's measured
9 all this kind of bad stuff that we'd rather take out,
10 right, and not have people worried about, young athletes
11 worried about, they just experience it more. So the
12 cognitive anxiety is what's going on up here, right,
13 worry and doubt, and the somatic anxiety is I can't get
14 a grip on my heart rate, my muscles feel tense, I have
15 butterflies and those kinds of things. So we see that
16 more with athletes high in ego orientation.

17 Q. Well, when you were going through college and
18 getting your Ph.D., you were striving to do your very
19 best and you were striving to succeed and get As to get
20 your Ph.D. All of those things are something that
21 requires you to succeed and to convince other people how
22 good you are, right?

23 A. To succeed and make the world better.

24 Q. Right, but to get a Ph.D. that's a tough --- is

1 that an easy thing to do?

2 A. No, it is not.

3 Q. And it is based on what other people think of
4 you and your work, right?

5 A. Yeah. I mean, there's requirements to complete
6 a Ph.D. for sure that involve other people.

7 Q. And they're judging your work, right?

8 A. Right.

9 Q. And that creates, I presume, for most people it
10 creates a lot of anxiety. Did it for you?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: You know, at times it was
13 stressful, but I enjoyed every minute of it. And so
14 some of this comes back to anxiety is pretty typical and
15 we're going to experience that, but what I'm feeling
16 about it is helping people develop strong coping skills
17 so that they can deal with that stress and anxiety. And
18 that is, you know, another study that we recently
19 published that people who perceived a caring task
20 involving climate reported greater coping skills, right.

21 BY ATTORNEY TRYON:

22 Q. And to develop those coping skills you need to
23 sometimes follow the rules of others like those on the
24 Ph.D. committee, if that's the right terminology, rather

1 than saying, hey, committee you're wrong, I'm right, you
2 have to do what I say, right?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: I'm not sure that's related
5 to coping skills, but what you said is true, it does
6 take place when you're working on a Ph.D.

7 BY ATTORNEY TRYON:

8 Q. And pretty much every part of life you can't
9 just say I don't like your rules, do it my way and get
10 your way, you have to cope with the world as it is, not
11 as you want it to be all the time, right?

12 A. Right.

13 ATTORNEY VEROFF: Objection.

14 BY ATTORNEY TRYON:

15 Q. And that's a hard thing, right?

16 A. It is.

17 Q. But it builds character, doesn't it?

18 A. It sure can.

19 Q. So let me move on then. I think I understand
20 what you're saying in this paragraph. Looking at
21 paragraph 35, okay, let me see if we addressed some of
22 these things. Have you studied depression and mental
23 health with athletes?

24 A. No, it's not my area. Yes, I've read some, but

1 no, it's not an area that I studied in depth.

2 Q. So you haven't written on it?

3 A. We might have a study where we include some
4 parameters of psychological well-being, like studies
5 with kids, looking at how the climate relates to a
6 caring climate relating to reporting greater hope and
7 happiness and less depression and sadness, but studying
8 like depression is not a primary area for me.

9 Q. Have you looked at the issue for athletes
10 between injuries and mental health or depression?

11 A. No, no.

12 Q. Are you aware that there are studies and papers
13 on that issue?

14 A. Yes.

15 Q. Okay.

16 Let me ask you to take a look at --- well,
17 before we go, have you heard of the American College of
18 Sports Medicine?

19 A. I have.

20 Q. And are they well regarded?

21 A. Yes.

22 Q. Have you heard of Andrew Wolanin?

23 A. I have not.

24 ATTORNEY TRYON: Okay.

1 Well, let's bring up this exhibit, which
2 will be then Exhibit --- I think this will be --- well,
3 I will just ask, Jake, help me out with numbers. The
4 title is Depression and Athletes, Prevalence and Risk
5 Factors.

6 VIDEOGRAPHER: I believe we're on Number
7 8 now.

8 ATTORNEY TRYON: Okay. Perfect.

9 VIDEOGRAPHER: Just give me one moment.
10 ---
11 (Whereupon, Exhibit 8, Article, was
12 marked for identification.)

13 ---

14 BY ATTORNEY TRYON:

15 Q. Have you seen this document that I now marked as
16 Exhibit-8 before?

17 A. No, I haven't. Jake, can you show the top again
18 please?

19 VIDEOGRAPHER: That is as far up as it
20 goes.

21 THE WITNESS: Okay.

22 BY ATTORNEY TRYON:

23 Q. Are you familiar with any of the three authors?

24 A. No.

1 Q. So I am going to ask you about several parts in
2 here, so it might be helpful to have --- try one more
3 time to see if you can --- give you access to it, to
4 give you control over the screen so you can scroll down.
5 And you should be able to treat it just like anything
6 else on your iPad, with your fingers or however you do
7 it.

8 A. So when I click on control it has like a
9 keyboard and then it has a question mark.

10 ATTORNEY TRYON: Jake, any input?

11 VIDEOGRAPHER: It sounds like it's just
12 bringing up the iPad keyboard and there should be
13 something that looks like a keyboard and that minimizes
14 the keyboard itself so you can just get back to the
15 screen.

16 ATTORNEY VEROFF: I'm sorry, Dr. Fry.

17 THE WITNESS: No, go ahead.

18 ATTORNEY VEROFF: I was just going to
19 ask, Dave, is there any way to get in touch with Dana.
20 Maybe we could send her the PDF and have her print them
21 so that the witness could have hard copies. That might
22 make this all work a little bit easier for any --- for
23 this or any other studies that you would want her to
24 look at.

1 VIDEOGRAPHER: Okay.

2 ATTORNEY TRYON: Okay, right there is
3 great.

4 BY ATTORNEY TRYON:

5 Q. Okay.

6 Do you see that, Doctor Fry?

7 A. Yes.

8 Q. So the title you have here is Excluding Groups
9 from Participating in High school Athletics would
10 Deprive Them and Their Teammates of a Wide Range of
11 Educational Benefits. Did you write that?

12 A. Yes.

13 Q. Okay.

14 Then I would like to compare that to the title
15 that you have in your latest report, if you could bring
16 that up, and that is on page ten. So here you change
17 groups from to excluding transgender students. Why did
18 you make that change?

19 A. I think just because it's specific to this case.

20 Q. Well, the specifics of this case were the same
21 before as they are now, so do you have any better
22 explanation?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: You know, I edit everything

1 I write, and so if I see something that may clarify more
2 or change a word, you know, that makes it better, then I
3 would do that. I think that's what happened here.

4 BY ATTORNEY TRYON:

5 Q. Are you aware of any groups being excluded from
6 participating in youth or adult athletics?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: You know, I think a lot of
9 times kids with disabilities are kept out. I think kids
10 who have limited financial resources sometimes are
11 limited. I think groups are --- so it may not be a rule
12 that you cannot play, but you know, there are other
13 groups who miss out on the opportunities to play.

14 BY ATTORNEY TRYON:

15 Q. Other than that, can you think of any groups
16 that are excluded by any rule or requirements from any
17 athletic activities?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: Not that's coming to mind
20 that are, you know, like obvious or stated in the rules,
21 but I think there's personal different ethnic, minority
22 groups, for example, that might have less exposure to
23 sport, things like that.

24 BY ATTORNEY TRYON:

1 Q. Let me ask you about Special Olympics. Is the
2 entrance into Special Olympics --- do you know anything
3 about --- let me back up. You're aware of what Special
4 Olympics is, right?

5 A. Yes, I'm aware of it.

6 Q. And do you know if there are specific
7 requirements in order to be able to participate in
8 Special Olympics?

9 A. I know there are. I couldn't tell you what they
10 are across the different categories and all.

11 Q. Can able bodied athletes and able minded
12 athletes participate in Special Olympics?

13 A. Special Olympics was created to give athletes
14 --- okay. Dana said she hadn't received those. Just to
15 double check, that it is Dana@midwestreporters.net.
16 It's not .com.

17 VIDEOGRAPHER: I will double check it.

18 THE WITNESS: Thank you.

19 ATTORNEY TRYON: Sorry to interrupt your
20 flow.

21 BY ATTORNEY TRYON:

22 Q. So my question was can able-bodied athletes and
23 able-minded athletes participate in Special Olympics,
24 and you started to say Special Olympics was created.

1 A. Right. The answer is no, they can't
2 participate.

3 Q. So that is an exclusion, right?

4 A. Yes.

5 Q. And it's a categorical exclusion, right?

6 A. Yes.

7 Q. Do you think it's a fair exclusion?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: Sorry. Yes, in this case.

10 BY ATTORNEY TRYON:

11 Q. And why?

12 A. Because those able-bodied athletes have another
13 area where they can compete.

14 Q. And so Special Olympics is especially designated
15 for certain athletes who are not able to compete against
16 able-bodied and able-minded athletes, right?

17 A. Uh-huh (yes), yes.

18 Q. So it's essentially a protected category, right?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: Yes. I don't know if it is
21 protection so much, as just provide an opportunity.

22 BY ATTORNEY TRYON:

23 Q. And that exclusion is of --- with respect to
24 Special Olympics, you wouldn't call that arbitrary,

1 would you?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: No.

4 BY ATTORNEY TRYON:

5 Q. Now, if we go down in paragraph 37, the second
6 sentence says, if transgender students are arbitrarily
7 excluded from youth sports they are, in turn, deprived
8 of those positive experiences and outcomes and their
9 teammates are deprived of a genuinely optimal sports
10 experience.

11 Do you see that?

12 A. I do.

13 Q. If that exclusion is based on safety concerns or
14 performance concerns then it would not be arbitrary.

15 Correct?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: If there were strong
18 evidence for those.

19 BY ATTORNEY TRYON:

20 Q. And just --- I think we covered this, but I just
21 want to make sure I'm correct, you are not an expert on
22 safety issues, right?

23 A. That's right.

24 Q. And you are also not an expert on performance

1 issues, right?

2 A. That's right.

3 Q. What would you call strong evidence?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: I call it data that the
6 experts come to agree that --- you know, how they can
7 guide the rules for sport, right, and balance inclusion
8 and fairness.

9 BY ATTORNEY TRYON:

10 Q. Would you agree with me that not all experts
11 agree on everything, even with their own field, right?

12 A. That's right.

13 Q. Is there a minimum number of experts that would
14 have to agree before it's strong evidence or is that
15 sort of a --- I don't know how to say it. What do you
16 think?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: I think with respect to
19 this case, that organizations can, you know, weigh in on
20 the evidence there to see --- I mean, there is just a
21 lot of injury within sport that happens, right, it's
22 just part of sport. So I think they would have to
23 really consider the evidence to see if there are safety
24 concerns for having transathletes participate.

1 BY ATTORNEY TRYON:

2 Q. Do you think in high school that every sport
3 should have a different rule of when transgender girls
4 can participate in those specific girls sports?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: You know, I just come back
7 to my expertise and why I've been asked to be on this
8 case is just to address the benefits that athletes
9 receive from participating in sport. So I wouldn't
10 perceive that they are at the high school level. There
11 is different rules for every sport, but I don't know
12 where we will be down the road, right, as we just figure
13 all this out and strive to include all athletes.

14 BY ATTORNEY TRYON:

15 Q. So you don't know what the rules should be?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Right, I'm not the best
18 person to make those decisions. I think we need people
19 who are studying these issues, and that is beyond my
20 expertise.

21 BY ATTORNEY TRYON:

22 Q. Fair enough. I don't want you to go beyond your
23 expertise. Well, let me ask you just some related
24 questions. And you may say the same thing on this, but

1 I'm going to ask you and we will see if you have any
2 thoughts. You may have already answered this, but let
3 me ask you these. On what teams should student athletes
4 participate on if they are transgender? If they are a
5 transgender girl, should they participate on boys or
6 girls teams?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: I think it depends what the
9 rules are, but, you know, over the last decade across
10 organizations, organizations have found a way to allow
11 transgender females to participate.

12 BY ATTORNEY TRYON:

13 Q. And those rules have changed over time, right?

14 A. They do.

15 Q. NCAA just changed its rules, right?

16 ATTORNEY VEROFF: Objection.

17 BY ATTORNEY TRYON:

18 Q. Did you answer?

19 A. You know, I'm not sure of the latest. I thought
20 they were going to leave --- yeah, they're going to be
21 looking at other options and getting feedback from the
22 governing bodies is my understanding.

23 Q. Are you aware of what the Rugby Association
24 says?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: No.

3 BY ATTORNEY TRYON:

4 Q. Are you aware of USA Swimming, what their rules
5 are?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: I couldn't tell you all the
8 details, but I know USA Swimming really is trying to
9 find a way to be inclusive, and so I know at the youth
10 levels that transgender youth are able to participate,
11 right, and that they have allowed some rule changes for
12 what swimsuit kids wear and things like that.

13 BY ATTORNEY TRYON:

14 Q. But those transgender girls have to --- or
15 transgender women have to meet certain requirements
16 before they can participate on a female team.

17 Right?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: Yes.

20 BY ATTORNEY TRYON:

21 Q. Are you aware of the specifics?

22 A. No. I've read some of this, but I'm not sure
23 I've retained it and it's not something that I spent a
24 long time on across sports.

1 Q. Okay.

2 Let me ask you then if you have ever heard of
3 the term nonbinary?

4 A. I have heard of that term.

5 Q. Is this a fair definition, that it is people who
6 do not describe themselves or their genders as fitting
7 in the category of man or woman? Does that sound like a
8 fair definition?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Yes.

11 BY ATTORNEY TRYON:

12 Q. Should a biological male who identifies as
13 nonbinary who is an athlete participate in high school
14 on the boys or girls team?

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: I think it depends on what
17 the rules are. And I think the goal of the sport
18 organizations seems to be how can we look at these
19 issues and just still try to be as inclusive as
20 possible.

21 BY ATTORNEY TRYON:

22 Q. What are the rules on that in high school?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Right, it seems to vary

1 across states.

2 BY ATTORNEY TRYON:

3 Q. Do you know of any rule --- do you know of any
4 rule that specifically addresses nonbinary athletes?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: No.

7 BY ATTORNEY TRYON:

8 Q. Have you heard the term bigender?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Yes.

11 BY ATTORNEY TRYON:

12 Q. The definition that I have read is a person who
13 identifies as bigender has two genders. Is that your
14 understanding as well?

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: Yes.

17 BY ATTORNEY TRYON:

18 Q. And in high school the biological male
19 identifies as bigender and wants to participate on a
20 girls sports team, should that be allowed?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: I think greater context is
23 needed. There's a --- you know, understand what's going
24 on with that particular athlete. And again, I just want

1 to --- this is a little bit beyond my expertise and I'm
2 here to just reenforce that there is a lot of benefits
3 for all athletes to be able to participate.

4 BY ATTORNEY TRYON:

5 Q. What if a biological male wants to be on a girls
6 team, even though he does not identify as a girl, should
7 he be allowed to do so?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: No.

10 BY ATTORNEY TRYON:

11 Q. And why not?

12 A. Because he's wanting to play on a --- on a
13 female team and he doesn't --- hasn't transitioned and
14 isn't identifying as a female.

15 Q. If a biological male wants to participate on a
16 girls team and identifies as a female but has not
17 transitioned in any way, should he be allowed to
18 participate on the girls team?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: In --- in general I would
21 say no, but we're missing the context. What if this was
22 --- yeah, I think we want that person to transition.

23 BY ATTORNEY TRYON:

24 Q. Okay.

1 What transitioning would be necessary?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: I think that's out for
4 debate, discussion, and to figure out at these different
5 levels of sports what that criteria is going to be.

6 BY ATTORNEY TRYON:

7 Q. So in high school is it simply changing your
8 name to a female name, would that --- for a male to
9 change to a female name, would that be adequate to then
10 be allowed to play on the girls team?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: No, I'd say in general that
13 wouldn't be the case.

14 BY ATTORNEY TRYON:

15 Q. Okay.

16 If that person, in addition to changing his
17 name to a female name and says I want to be addressed
18 using female pronouns, is that adequate?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: I think that we've got this
21 kind of continuum it sounds like, right, to what degree
22 people are transitioning to know transitioning. And to
23 just have a blanket statement that no one --- that no
24 transathlete can ever participate in sport ever across

1 the universe is harmful for many athletes, right. And
2 so these specifics of where we are going to go with what
3 the criteria is for athletes, right, I think there's a
4 lot of people studying these issues and weighing in and
5 I'm not one of those individuals who's really studying
6 this stuff in detail at that level, but I do know ---.

7 BY ATTORNEY TRYON:

8 Q. Sorry. Go ahead.

9 A. I do know that inclusion in sport has many
10 benefits and that it would be a shame to not hold a
11 category of athletes out to participate.

12 Q. So there would be nothing to stop a male
13 athlete, a biological male athlete identifying as a
14 female from participating on a boys team, right?

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: Right. I did not state
17 that. I'm not sure what that criteria should be, but it
18 helps us balance, being inclusive and also being fair.

19 BY ATTORNEY TRYON:

20 Q. So it's not excluding that person from
21 participating in sports, it's just excluding that person
22 from participating on the team that person wants to
23 participate on, right?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: If we understand that
2 transathletes are identifying with a particular gender,
3 so in this case transfemales, then no, that wouldn't be
4 an option to go participate on a male team.

5 BY ATTORNEY TRYON:

6 Q. Well, why is that not an option?

7 A. Right, well, I just point to PBJ, right, who has
8 identified as a girl for a long time and looks very much
9 like a girl and is the --- I believe the principal said,
10 you know, we're just creating problems. This little
11 girl can be with her friends, can run cross-country, can
12 reap all these benefits, right, and it's not an option
13 to send her over to the boys team because she is a girl.

14 Q. Do you need to look like a girl to be on the
15 girls team?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: No, I'm not sure what that
18 means.

19 BY ATTORNEY TRYON:

20 Q. Well, there are girls that look masculine that
21 are girls and they, of course, want to be on the girls
22 team. I would presume you would agree they should be on
23 the girls team, right?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: Right, there are --- you
2 know, we may get into a debate about what is masculine
3 or feminine if we're saying that --- you're describing
4 somebody as more --- a female that's more masculine, but
5 maybe other people see it that there's a feminine
6 quality to whatever, being strong, yeah, having a solid
7 build, those things.

8 BY ATTORNEY TRYON:

9 Q. Well, you're the one that pointed out that BPJ
10 looks like a little girl and suggesting that that was
11 one of the reasons that BPJ should be on the girls team.
12 Did I understand that incorrectly?

13 A. What, I meant to emphasize is that she sees
14 herself as a girl, and so we put her in a really
15 uncomfortable spot to say you can't be with the girls
16 and you have to go be with the boys even though in your
17 heart of hearts you know you're a girl.

18 Q. Can that be uncomfortable for the biological
19 girls on the girls team if biological boys who identify
20 themselves as internally as being girls are allowed to
21 participate on the girls team?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: Could --- you know, could
24 the fact that a transgender girl is participating in a

1 sport, on a team, could that make someone feel
2 uncomfortable? Definitely it's possible.

3 BY ATTORNEY TRYON:

4 Q. Not only is it possible, but it happens, right?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: Yes, I think it probably
7 happens. It probably happens both ways, that there are
8 also teammates that are very supportive.

9 BY ATTORNEY TRYON:

10 Q. But the feelings of the biological girls who are
11 uncomfortable with a biological male identifying as a
12 female or a transgender girl, as you have said, their
13 feelings are important too, right?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: You know, pulling from my
16 expertise, if we're trying to create this caring task
17 involving climate, then yes, it would be very important
18 for a coach to sit down with those athletes and talk and
19 encourage them. If the transfemale athlete is playing
20 by the rules and has done everything that has been asked
21 and they are part of a team, then coaches should really
22 talk with the athletes than help them understand, help
23 them not let this be a distraction, help them embrace
24 all their teammates, right. There is so much in the

1 sport that any of us on a team might like to change,
2 right, or wish our teammates did other things, right,
3 wish they worked harder or wish they used less
4 recreational drugs or anything, right, but we are a team
5 and we come together and we just support each other and
6 we keep the focus on being the best we can be every day.

7 BY ATTORNEY TRYON:

8 Q. So biological girls just need to knuckle under
9 and accept things the way that you want them to be. Is
10 that what you are saying?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I'm saying being part of a
13 team is challenging, and for some people having a
14 teammate that is transgender may be one of those
15 challenges they have to deal with. But everyone is
16 dealing with challenges with the teams, right. And if
17 that transgender athlete is there playing by the rules,
18 right, and is allowed to be there, then yeah, I guess
19 the others have to deal with it.

20 BY ATTORNEY TRYON:

21 Q. So on the other hand, you can tell that
22 transgender female to participate on the boys team and
23 the coach on the boys team would sit down with the boys
24 and say you will not make fun of this child, you accept

1 this child as one of our own even though this child is a
2 transgender female, this transgender female will be on
3 the boys team and you will treat this transgender female
4 with respect and be a full part of the team, right, that
5 coach could do that?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: Yes, the problem is that the
8 transgender athlete is a female, right, and has the
9 right to participate with the female team.

10 BY ATTORNEY TRYON:

11 Q. Where is that right found? You just said she
12 has that right. Where is that right?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: I mean as it comes within
15 the rules, right. I'm sorry, Julie. I mean, as it
16 falls within the rules, right.

17 BY ATTORNEY TRYON:

18 Q. Well, right now the rule is HB-3293, which says
19 that that transgender girl must participate on the boys
20 team. And since that is the rule, following your ---
21 your logic, you go to the boys team and the boys coach
22 and you say this child is going to be participating in
23 this team, you will welcome her with open arms onto our
24 team just as we do on football, we open with --- welcome

1 with open arms girls who are playing on a boys football
2 team, right?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: My understanding in this
5 case is that the judge is --- has kind of looked at the
6 evidence and said right now I think there is potential
7 discrimination and so we're going to let BPJ continue to
8 compete and all through this so ---.

9 BY ATTORNEY TRYON:

10 Q. That's right, the Judge did say that for now,
11 but he did not say that for everything. But I'm asking
12 for a more general rule. Putting aside BPJ, as a
13 general rule, why would you say coach of the boys team,
14 you will allow these transgender girls to come and play
15 on your team and you will welcome them with open arms
16 just as we do with our football teams that allow girls
17 to play on them?

18 ATTORNEY VEROFF: Objection.

19 BY ATTORNEY TRYON:

20 Q. Because after all, as you said, the transgender
21 girl is a girl and so should be allowed to play on the
22 boys team if she chooses?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: I think football is a great

1 sport, and I wish they had male and female teams.
2 Typically, it's just a male team, so a female who wants
3 to play football doesn't have another option. But in
4 this case BPJ and others who identify as a female and
5 should be able to compete with other females, their
6 friend group and --- so I see that as an indifference.

7 BY ATTORNEY TRYON:

8 Q. Their friend group? So girls can't have boy
9 friends?

10 A. No. I meant it --- sorry, I meant in this case
11 BPJ is saying her closest friends are on the girls team.
12 She is a girl and she --- and so it would be harmful,
13 not fair to not let her compete with that team.

14 Q. How do you define fair? You told me before you
15 are not an expert on fairness. Are you now saying that
16 you do know what is fair?

17 ATTORNEY VEROFF: Objection.

18 THE WITNESS: I'm just keeping focused on
19 what the rules are and the Judge has ruled right now
20 that BPJ should be able to compete with the girls
21 because she is a girl, and so from my perspective,
22 that's where it stands right now.

23 BY ATTORNEY TRYON:

24 Q. Okay.

1 That's just because that's what the Judge said
2 then, right?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: No. I think the core issue
5 is BPJ identifies as a girl, has lived the majority of
6 her life as a girl and wants to be able to participate
7 in her school activities as a girl, including
8 cross-country.

9 BY ATTORNEY TRYON:

10 Q. So how long do you think a transgender girl has
11 to live as a girl before participating on the girls
12 team?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: Again, I think I'm not the
15 best person for that line of inquiry. I'm not sure, but
16 I know others are studying that, those kind of issues,
17 and can add greater insight to it.

18 BY ATTORNEY TRYON:

19 Q. Okay.

20 A. I'm just someone who would hate to see BPJ not
21 be allowed to participate in her school activities, just
22 to be told no, I'm sorry.

23 Q. On the girls team?

24 A. Right.

1 Q. And of course, not all athletes compete on
2 teams. Sometimes if they just love to run, if that is
3 the key, they just love to run, they don't have to be on
4 a team to run, right?

5 A. Right.

6 ATTORNEY TRYON: So we have gone for an
7 hour. And I would like to get some documents printed
8 since we're not able to easily look at them on your
9 iPad. So why don't we go off the record to see if we
10 can get that taken care of. Is that okay with you,
11 Julie?

12 ATTORNEY VEROFF: That is great. Thank
13 you.

14 VIDEOGRAPHER: Going off the record. The
15 current time reads 3:15 p.m. Eastern Standard Time.

16 OFF VIDEOTAPE

17 ---

18 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

19 ---

20 ON VIDEOTAPE

21 VIDEOGRAPHER: We are back on the record.
22 The current time reads 3:37 p.m. Eastern Standard Time.

23 BY ATTORNEY TRYON:

24 Q. Professor Fry, thank you for helping us with

1 that technical issue.

2 A. No problem.

3 Q. I would like you to find the exhibit that says
4 Depression in Athletes. It should be Exhibit-8, I
5 believe.

6 A. I've got it.

7 Q. Okay.

8 I've lost you. There you are. Okay. Let me
9 find the right page I'm outlining to. Okay. So Exhibit
10 8 is Depression in Athletes: Prevalence and Risk
11 Factors by Andrew Wolanin and other authors, right?

12 A. Yes.

13 Q. So I wanted to ask you about a passage on the
14 second page of this, which is page 57, under the title
15 Sports Injuries and Depression at the bottom of the
16 first column. So I will just read the passage that I
17 have a question about and if you choose to read it, too,
18 if you want to read it more --- in fact, did you already
19 read the abstract on this earlier?

20 A. I just did.

21 Q. Okay.

22 So you've read the abstract. My question is
23 on, as I said, under Sports Injuries and Depression.
24 And I will just read into the record, Bruer and Petrie,

1 seven in parentheses, were among the first researchers
2 to compare depression symptoms between athletes who had
3 and had not experienced injuries. In this retrospective
4 study it was found that athletes who experienced an
5 injury during the previous year reported significantly
6 higher depression symptom scores than those reported by
7 non-injured athletes, as measured by the Validated
8 Center for Epidemiological Studies Depression,
9 parentheses, CES-D scale. Do you see that?

10 A. I do.

11 Q. And my question is do you have any reason to
12 dispute this or contest this finding in this statement?

13 A. No.

14 Q. Would it be fair to say that you agree with it?

15 A. You know, it's retrospective, so they're going
16 back in time and asking, hey, when you were injured what
17 was going on, but no, I would accept this is --- could
18 be a legitimate finding.

19 Q. Okay.

20 Then in the next column, first full paragraph,
21 there has been a recent surge of evidence suggesting
22 that sports concussions can lead to changes in emotional
23 state, parentheses, 14, closed paren, period.

24 Furthermore, there is recent evidence to suggest that

1 sports concussions can have long-lasting emotional
2 impact. And my question is, do you have any reason to
3 contest this statement? And feel free to look at it and
4 make sure I'm not reading it out of context.

5 A. No, I don't contest this.

6 Q. Then in the beginning of the last full paragraph
7 on the page it says, while the relationship between
8 concussion and depression may be significant there is
9 also evidence to suggest that a concussion may have the
10 same effect as other injuries on mental health. For
11 example, Main Wearing, et al., 18 in parentheses,
12 conducted a study to examine the differences between
13 emotional responses in athletes who had a concussion
14 compared with anterior cruciate ligament, ACL, injury.
15 They found that athletes with ACL injuries had more
16 severe levels of depression and longer duration of
17 depression compared to those athletes with concussion.
18 Do you see that?

19 A. I do.

20 Q. And do you have any reason to contest that
21 statement?

22 ATTORNEY VEROFF: I'll just object to the
23 extent this statement relies on a study that is actually
24 not before the witness.

1 BY ATTORNEY TRYON:

2 Q. Go ahead, you may answer.

3 A. Okay.

4 You know, there is probably just a lot of
5 background to this, so I agree. I haven't read this one
6 but I would jus say ACL injuries can be extensive and
7 last over months, right, and take an athlete out of
8 sports for months. Whereas a concussion, you know, it
9 varies in severity and somebody might be back relatively
10 quickly in comparison. But, you know, both of --- both
11 of these injuries are not fun for athletes to deal with
12 and, yeah, can cause stress and depression.

13 Q. Okay.

14 So I think you would agree that it's important
15 for athletes to avoid injuries where possible, right?

16 A. Right, right, and --- yeah.

17 Q. And would you agree that it is important to have
18 rules in place to avoid injuries where possible?

19 A. Yes, I would agree.

20 Q. And would you agree that we don't need to wait
21 for actual harm before putting rules in place to prevent
22 harm if it's reasonably foreseeable?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Yeah, the keyword is

1 reasonably.

2 BY ATTORNEY TRYON:

3 Q. Right. So you agree with that but focusing on
4 the word reasonably, right?

5 ATTORNEY VEROFF: Objection.

6 THE WITNESS: Right.

7 BY ATTORNEY TRYON:

8 Q. Would you agree that segregation of male and
9 female sports is at least in part to protect girls from
10 injury, at least for some sports?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: Possibly. I would just
13 note that there is tremendous variability within each
14 gender and if that were totally what was driving this
15 then we really would be concerned about some, for
16 example, not as strong males competing against bigger,
17 stronger males and same with females. So the issue just
18 transcend gender, you know, it's an issue within each
19 gender.

20 BY ATTORNEY TRYON:

21 Q. Well, you said you had some familiarity with
22 Title 9, right?

23 A. Yes.

24 Q. And Title 9 divides sports into boys --- male

1 and female sports in some instances, right?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: Yes.

4 BY ATTORNEY TRYON:

5 Q. And in particular, with respect to contact
6 sports, right?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: Yes.

9 BY ATTORNEY TRYON:

10 Q. And would it be fair to say that those contact
11 sports Title 9 does that specifically to --- for safety
12 purposes?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: I think it's fair to say
15 that that is a --- is a concern, yeah.

16 BY ATTORNEY TRYON:

17 Q. You wouldn't say that Title 9, the regulations
18 for Title 9 that regulate that, do you think those are
19 unfair or should be determined to be illegal?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: Right, no.

22 BY ATTORNEY TRYON:

23 Q. So let's go back to the study by --- I will say
24 it wrong, in Balaguer?

1 A. Yes, Balaguer.

2 Q. Balaguer, thank you. Do you speak French?

3 A. No, but she is one of my favorite people in the
4 world.

5 Q. Oh, okay.

6 VIDEOGRAPHER: Counsel help me out here,
7 which exhibit number is that?

8 THE WITNESS: Maybe 2.

9 ATTORNEY TRYON: No, the Balaguer.

10 VIDEOGRAPHER: If you can tell me the
11 title I can tell you the number.

12 ATTORNEY TRYON: I'm sorry.

13 VIDEOGRAPHER: I said if you can tell me
14 the title I can tell you the number.

15 ATTORNEY TRYON: Here it is. I think it
16 is number 7, Motivational Climate and Goal Orientation
17 as predictors of Perceptions.

18 VIDEOGRAPHER: Correct, that would be
19 Number 7.

20 BY ATTORNEY TRYON:

21 Q. And is that printed out for you, Professor Fry?

22 A. Yes.

23 Q. And going back in the report --- let me see if I
24 can find the right paragraph. Here we go, paragraph 32

1 of your most recent report. Okay. So the first clause
2 of that first sentence says athletes high in ego
3 orientation report lower companionship and greater
4 conflicts with teammates and you cite Balaguer for that
5 proposition. I simply was not able to find that
6 proposition in the Balaguer report. By the way, the
7 University of Valencia, where is that? Is that in
8 Spain?

9 A. It is.

10 Q. Then why does Elizabeth have a French name? I'm
11 sorry. If you could just look through and tell me if
12 you can see the language that supports your language in
13 paragraph 32.

14 A. Yeah, yeah, just one more second. Yeah, okay.
15 They give you this. I think this wasn't the best
16 article. It was referring to the coach instead of the
17 teammates with this one. But if you would look on ---
18 or maybe --- 383, that paragraph in the middle of the
19 first column. Yeah, just a little bit lower. But the
20 wording in this paragraph on the left, yeah, if you can
21 fit the whole thing in again. Right. So partway down
22 it's just asking about --- to write your current coach
23 or somebody that --- so one would be just doesn't
24 coincide at all with the coach I would like to have

1 versus my ideal coach. So the lower rating on the coach
2 is just --- that is not a good thing when you're going
3 this is not the coach that I want, right, or all the way
4 up to this is my ideal coach. So it supports the
5 findings that relationships aren't that strong, but it
6 is not the best study --- or you know, it shouldn't have
7 been slotted there because it's just referring to the
8 coach instead of the athletes. If you look at that
9 table underneath where we're looking now, Table 2.

10 BY ATTORNEY TRYON:

11 Q. I'm looking at it.

12 A. Whoops, is that it. Under satisfaction and so
13 the middle part on the left and the bottom one,
14 satisfaction with the coach, you can just see that the
15 more you perceive a task climate, the more you are
16 thinking this is the ideal coach, I'd like to have, the
17 more respect I have for the coach, or however you want
18 to put that in your words and the more you perceive an
19 ego climate the less and the more on the task
20 orientation, you are more likely to just say this is a
21 coach I'm glad I have. And with the ego orientation,
22 it's just not significant --- so anyway, it supports
23 the results for saying overall, but that was not the
24 best reference there. It shouldn't have been used right

1 there.

2 Q. So just to make sure I understand then, the
3 Balaguer report does not actually support the idea that
4 athletes high in ego orientation report lower
5 companionship and greater conflict with teammates,
6 right?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: Right.

9 BY ATTORNEY TRYON:

10 Q. Do you believe Smith and Small does?

11 A. Yeah. You know, a little while ago when we were
12 looking at that passage, it just included like ten
13 variables that were cognitive anxiety and worry and
14 concentration disruption and I don't know, five other
15 things, a lot of ways to measure stress. And so across
16 these studies a lot of ways that these relationships
17 with coaches and athletes, but it's not like everyone is
18 using one uniform measure. Yeah, so there's probably
19 more studies showing that you have better relationships
20 when people perceive a task involving climate or have a
21 task orientation and then it's kind of a mix on the ego
22 side. So sometimes that comes out and sometimes it
23 doesn't.

24 Q. Don't studies show that the best mix is a high

1 ego orientation and a high task orientation?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: No, I wouldn't agree with
4 that, that mixes --- it's not necessarily that that is
5 harmful, right, having a high task and high ego. But to
6 say it is the best, no, I wouldn't say that.

7 BY ATTORNEY TRYON:

8 Q. Is Smith and Small cited in the bibliography?

9 A. One of their articles by Grossbar is, but that
10 is looking more at the orientations in climate. That
11 one, I lost that page. I was just trying to see if
12 there was another one. There is one by Cummings, 2007,
13 Is Winning Everything, the Contributions of Climate
14 and ---.

15 Q. And that is going to tell me that --- is going
16 to support the statement that ego orientation creates
17 more conflict?

18 A. No, no. I'm not sure. I think I'd have to step
19 back and review to tell you for sure what those are, but
20 I can certainly do that.

21 Q. All right.

22 Well, let's move on. I don't want to keep you
23 here any longer than we need to be here.

24 A. Thank you. I appreciate that.

1 Q. You bet. So let me redirect your attention to
2 paragraph 39. So in the last --- let's see, the
3 sentence that says because these positive benefits are
4 fostered in task involving environment, arbitrary
5 exclusions can cause harm not only to the athletes who
6 are excluded but also to the other athletes on the team.
7 Can you tell me what harms it causes to other athletes
8 on the team?

9 A. It could cause harm to athletes who aren't
10 allowed to have their --- their friends participate,
11 their friends who should be on the team, right, if ---
12 BPJ was not allowed to participate and her friends
13 really were looking forward to that being a part of the
14 sport, right. The sport experience is to share that
15 together. That could be harmful. It is also just, you
16 know, it could be a missed opportunity to --- for kids
17 to learn and to grow and to become more familiar and to
18 become more accepting, right.

19 Q. So if that's the case, couldn't the coach just
20 say to them I know you would like to have your friend on
21 the team, but that's not the way it works and help them
22 work through that, just as you told me the coach can
23 counsel kids who disagree with the decisions --- some
24 other decisions?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: Okay.

3 Definitely a coach could do that, but
4 that doesn't change the fact that --- that it could be
5 harmful in the sense that knowing that other people you
6 care about and evaluate are being excluded in an unfair
7 way.

8 BY ATTORNEY TRYON:

9 Q. And that term, the unfair way, is something that
10 you said that you are not an expert on what's fair and
11 what's unfair, right?

12 A. Right. I said it's not a primary area of study,
13 right.

14 Q. Yeah. Well, I want to ask you a question. I
15 think you're referring to the Plaintiff as PBJ, with
16 first letter being P.

17 Am I hearing you right?

18 A. I didn't think so. But it does --- but BPJ.
19 Sorry.

20 Q. All right. I want to make sure we're all saying
21 the correct initials.

22 VIDEOGRAPHER: Excuse me, Counsel. If I
23 could interrupt for a second. If I could just ask the
24 witness to kind of sit up. You're starting to slouch

1 down and your head is getting cut off in the video.

2 Thank you.

3 THE WITNESS: All right. Sorry about
4 that.

5 BY ATTORNEY TRYON:

6 Q. You're not saying that any West Virginia sports
7 organization or educational education has adopted an
8 ego-promoting philosophy, are you?

9 A. I'm not.

10 Q. And you don't know of any coaches in West
11 Virginia that have either, right?

12 ATTORNEY VEROFF: Objection.

13 THE WITNESS: No.

14 BY ATTORNEY TRYON:

15 Q. And a team can build a task oriented climate
16 with sports separated by sex, right?

17 A. That's right.

18 Q. Do you know if female teams are better at
19 building task oriented climates than boys teams or vice
20 versa?

21 A. Yeah. It's possible to build a strong task
22 involving caring climate in both teams with males and
23 females. There may be a slight tendency across some
24 studies where those scores come out a little bit higher

1 for females than males, but it's not consistent, right,
2 but females sometimes really value that --- those social
3 aspects of the sport. Not that males don't, but maybe a
4 slightly higher --- if we're looking at those bell
5 curves again, they would be really close, but it's
6 possible that for --- if we are looking at guys they
7 might come out a little bit higher on the ego aspects of
8 the climate and females the task.

9 BY ATTORNEY TRYON:

10 Q. Can we look at paragraph 41 of your report,
11 please?

12 A. Yes.

13 Q. So you say the climate of youth sports must be
14 geared to include all participants, so that teams are
15 more likely to help every athlete maximize their
16 potential. Now, the word must is a mandatory word,
17 right?

18 A. Yeah. I think it means must in the sense that
19 that's our aim, to maximize the potential of every
20 athlete. If that's our aim, then it is pretty key to
21 creating that climate.

22 Q. So who would be the --- what entity would be the
23 one to enforce that?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: Right, I think it comes
2 down to a matter of administrators in sport leagues and
3 having a desire to provide coaching education, try to
4 help coaches understand this research and to help foster
5 caring and task involving climate.

6 BY ATTORNEY TRYON:

7 Q. Are you suggesting there should be a statewide
8 or nation-wide rule on this?

9 A. No.

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: No, I'm not suggesting.
12 I'm sorry, Julie.

13 ATTORNEY VEROFF: That is quite okay. Go
14 ahead.

15 THE WITNESS: No, I'm not suggesting
16 that, although I would just note that Canada has a basic
17 coaching education for anyone who is going to work with
18 even very young athletes, right, and then they have
19 these different levels that people need to go through
20 this coaching education because they really value trying
21 to help create inclusive environments that help kids
22 focus on their effort and improvement and can be set up
23 in a way to bring out the best in any child.

24 BY ATTORNEY TRYON:

1 Q. So what you said in Canada, they have this, who
2 has this?

3 A. I believe it kind of trickled down from the
4 government, that they just said --- you know, in the
5 States, in the U.S., our model is if you have a
6 heartbeat, right, and you're willing, let's put you with
7 a team because we just want --- want to have as many
8 teams and neighborhoods where kids can participate. But
9 in Canada they just set the bar higher and they said if
10 you're going to work with kids, we want you to have some
11 basic coaching education. And so it's just a rule
12 across their sort of sporting government.

13 BY ATTORNEY TRYON:

14 Q. You say sporting government. Are you saying the
15 national government is doing this or some sporting
16 organization? I don't know much --- anything about
17 Canada as far as that is concerned.

18 A. Yeah. You know, I would have to look at that
19 more closely. Definitely their sporting organizations,
20 but I'm not sure that doesn't trickle down from some of
21 their government rules, but I won't say that for the
22 record. For the record, I'll just say that they do
23 require any use for a coach to have a basic introduction
24 to coaching education, which would include some of these

1 concepts.

2 Q. But you're not advocating that for the United
3 States, are you?

4 A. No.

5 Q. Okay.

6 Let's see, so my next question is you say so
7 that teams are more likely to help every athlete ---
8 I'm sorry, strike that.

9 Still that first clause. The climate of youth
10 sport must be geared to include all participants. So
11 who gets to participate? When you say all participants
12 what do you mean by that?

13 A. Hopefully, we have an avenue for all young
14 people to gain some exposure to youth sport, so all
15 athletes who want to.

16 Q. Okay.

17 So in some sports and high school athletes and
18 in college you have tryouts. And if you don't make the
19 tryouts, you don't make the team.

20 Right?

21 A. That's right.

22 Q. And do you think that's okay or do you think
23 that we should do away with tryouts and everybody should
24 be on the team if they want to be on the team?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: I think there is a lot of
3 benefits to looking at high school sports and including
4 as many athletes as we can. But no, I wouldn't say that
5 I'm against all --- everywhere we should have a no cut
6 policy. But I think it's valuable to look and say, hey,
7 are we including as many kids as we can. Because the
8 evidence supports that kids feel more connected at
9 school, you know, their attendance is better. There's a
10 lot pluses when kids get that opportunity to
11 participate.

12 BY ATTORNEY TRYON:

13 Q. Don't sports sometimes take kids away from their
14 academics?

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: They sometimes do for some
17 kids.

18 BY ATTORNEY TRYON:

19 Q. For a lot of kids, isn't it?

20 A. I'm not sure what the percentages are, but yeah,
21 some kids may be less focused on academics.

22 Q. And that is why a lot of schools actually have
23 rules on minimum academic scores that you are getting in
24 order to be on a team, right?

1 A. Probably so, yes.

2 Q. So going back to cutting kids off teams, that's
3 a thing where kids, if they don't perform at a certain
4 level, they're cut from the team or never allowed onto
5 the team, right?

6 A. Right.

7 Q. And so if somebody does better than you on that
8 team, then you are at a disadvantage, right?

9 ATTORNEY VEROFF: Objection.

10 BY ATTORNEY TRYON:

11 Q. If you are cut from the team?

12 A. Yes.

13 Q. Now, you say from an educational standpoint it
14 is optimal to encourage all athletes to do the best they
15 can and to help all athletes enjoy the sport they love,
16 right?

17 A. Uh-huh (yes). Yes.

18 Q. So when you say from an educational perspective
19 let me just ask you --- do you feel like you are an
20 expert on education or teaching methodology?

21 A. It depends. When I say an educational
22 perspective I mean from the sports psychology
23 literature. And you know, it's not what I study in ---
24 sorry, I'm just going to think for a second.

1 Q. Take your time. I want to get an accurate
2 answer from you. I'm not trying to fool you or
3 anything.

4 A. Thank you. Yeah, I think this is building on
5 achievement goal perspective theory that just as we
6 should be helping all kids be the best that they can be,
7 right, and if we're not doing that, then we're more
8 likely setting it up to just focus on those kids who we
9 think are going to be the best and the highest
10 achievers, but to keep the focus on helping every
11 athlete, every student, be the best that they can be I
12 think is really a valuable aim.

13 Q. Do you know how many schools in West Virginia
14 have sports programs?

15 A. I do not.

16 Q. Do you have any idea of what percentage of kids
17 are in athletic programs in West Virginia schools?

18 A. I don't.

19 Q. Do you know about in any of the universities in
20 West Virginia?

21 A. No, I don't know.

22 Q. Take a look at paragraph 42. Read that. I'm
23 not going to read it all out loud, but I do have some
24 questions for you about paragraph 42.

1 A. Okay. Okay.

2 Q. As far as I can tell, this paragraph has nothing
3 to do with House Bill 3293, does it?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: I think it takes a bigger
6 picture perspective of just the youth sport world, and
7 so what's true for parents, for this parent, Jim
8 Thompson, who had a child who experienced so much
9 negative, you know, interactions when he first signed up
10 for sport, that Jim Thompson was like, wow, this is
11 crazy, and he went on to start this organization to
12 provide coaching education for --- you know, for
13 coaches. He has materials for parents, for officials,
14 but you know, reading it, it makes me think it would be
15 healthy for all of us to step back and just say, hey,
16 let's not get too, too over crazy about this, right.
17 And in the case of BPJ, right, how cool if we can let
18 her have the experience of running cross-country school
19 and wouldn't it be a shame if we just had a blanket
20 exclusion of kids based on their gender identity.

21 BY ATTORNEY TRYON:

22 Q. Okay.

23 But what does that have to do with HB-3293?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: You know, it's probably
2 just a matter of how we interpret this, but if we --- if
3 we have legislators just making a blanket decision that
4 across our state no child in secondary education, no
5 athletes in universities who are transathletes can
6 participate, it feels like we are really doing a
7 disadvantage to those athletes and not allowing them to
8 participate and reap the benefits. And I think Jim
9 Thompson here is just saying there is just so many
10 benefits and what if we were all united and saying how
11 can we come in and just make sport be all it can be.
12 Parents play a big role in that, but they're definitely
13 not the only party that does.

14 BY ATTORNEY TRYON:

15 Q. Is it your position then that a child or youth,
16 a young adult should be allowed to participate on
17 whatever team that child identifies as being a gender
18 associated with that team? That wasn't very artfully
19 said, so let me try again. Is it your position that any
20 child that identifies as a girl should be allowed to
21 participate on a girls team or women's team as the case
22 may be?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: It's my position that when

1 I look at the sport organizations across this country
2 and internationally that sport leaders are recognizing
3 that we want to balance fairness with inclusion and that
4 there has been success in that already and that that is
5 something that we can do and that we don't have to just
6 exclude all trans athletes from participating in sport.

7 BY ATTORNEY TRYON:

8 Q. So you have not answered my question directly.
9 Is that because you don't want to or because you don't
10 feel like you can?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I feel like it's more
13 complex than what you're mapping it out. When we talk
14 about transathletes and their gender identity and
15 whether they may be transitioning and all these other
16 factors, it's just a bigger picture than saying any male
17 should be able to decide at any moment I want to compete
18 as a female. No, we have to have guidelines in place
19 that are fair and inclusive.

20 BY ATTORNEY TRYON:

21 Q. So if we just narrowed down the statute somewhat
22 to imply with your views on that, then you think it
23 would be okay to exclude some transgenders ---
24 transgender girls from competing on girls teams but not

1 all?

2 ATTORNEY VEROFF: Objection.

3 BY ATTORNEY TRYON:

4 Q. Is that right?

5 A. Right. I think that's what's happening right
6 now, right, there are like criteria within the NCAA, for
7 example, and athletes have meet that criteria to
8 participate as a transgender female.

9 Q. And so a statute that did that you would find
10 okay?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I believe sport
13 organizations and leaders are going to be able to find a
14 way to balance inclusion and fairness, and what that may
15 look like across sports or different levels, yeah, I'm
16 not an expert on that and couldn't outline all that for
17 you right now. I could just say it makes me sad when
18 athletes are excluded and not given a chance to reap all
19 these amazing benefits from being a part of sport.

20 BY ATTORNEY TRYON:

21 Q. I hear you, but I still want to know if you
22 believe that there's a place for the State to pass laws
23 to regulate that?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: Yeah, I don't think the
2 State legislators in my view are the best position. I
3 feel like the sport organizations and sport leaders and
4 people really invested and knowledgeable and involved in
5 the sports at different levels should be making these
6 calls.

7 BY ATTORNEY TRYON:

8 Q. So you don't believe that the State should pass
9 any law whatsoever regulating participation of
10 transgender girls in girls sports?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: Yeah, I'm not speaking to
13 every possible law that could ever be invented, but with
14 regard to this House Bill, right, I think it's
15 unfortunate to have just a blanket exclusion for
16 transathletes, for transfemales.

17 BY ATTORNEY TRYON:

18 Q. Fair enough. What about maybe a --- well, let
19 me just ask this question. When kids are competing, is
20 it their identity that's competing or is it their body
21 that's competing?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: I'm sorry. I wouldn't even
24 know where to begin to address that question or what

1 even ---.

2 BY ATTORNEY TRYON:

3 Q. Let me see, you're not an expert on puberty
4 blockers therapy for boys or young men who want to be on
5 the girls teams, right?

6 A. I am not.

7 Q. And you're not an expert on testosterone
8 suppression for boys or young men who wanted to be on a
9 girls team, right?

10 A. That is correct.

11 Q. And you are not an expert on hormone therapy for
12 boys or young men who want to compete on girls teams,
13 right?

14 A. That's correct.

15 Q. Let's take a look at Exhibit-11.

16 ATTORNEY TRYON: Jake, if you could bring
17 that up. Excuse me, Exhibit-9. I beg your pardon. I
18 have to relabel some of these.

19 ---

20 (Whereupon, Exhibit 9, Article on Lia
21 Thomas, was marked for identification.)

22 ---

23 BY ATTORNEY TRYON:

24 Q. So I'm sure you expected that I was going to ask

1 you some questions about Lia Thomas, didn't you?

2 A. I didn't know what to expect, honestly.

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: I didn't know what to
5 expect.

6 BY ATTORNEY TRYON:

7 Q. Of course, the whole issue with Lia Thomas has
8 been in the news a lot, and so I want to ask you about
9 --- this is an article in Fox News. It says Penn
10 Swimmer Slams School's Handling of Lia Thomas Saga.
11 They Don't Actually Care about Women at All. So have
12 you seen this article?

13 A. No.

14 Q. But you are aware of the Lia Thomas what I will
15 call controversy, right?

16 A. Yes.

17 Q. So the first paragraph says a swimmer on
18 University of Pennsylvania Women's team says she feels
19 the school's decision to allow transgender swimmer Lia
20 Thomas to compete has created an unfair balance within a
21 sport that prioritizes Thomas's rights over that of
22 biological female student athletes. A student who spoke
23 to Fox New Digital on the condition of anonymity out of
24 fear of retribution said she was hopeful after learning

1 the NCAA's decision last week to update its policies of
2 allowing transgender girls to compete based on hormone
3 levels. And then skipping down it says stuff like that,
4 it's not just the difference between two girls and how
5 one may have slightly larger lungs that gives them a
6 slight advantage. These are monumental advantages that
7 biological males just develop through puberty and it's
8 not something that a year of hormone treatments, in
9 brackets, can suppress because they still have all the
10 muscle mass that they had for the last 20 years, closed
11 quote. Do you believe that this swimmer is justified in
12 her feelings about this being unfair?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: I believe this swimmer has
15 the right to her opinion, for sure.

16 BY ATTORNEY TRYON:

17 Q. Do you agree that it was unfair for Lia Thomas
18 to compete with the girls on the team?

19 ATTORNEY VEROFF: Objection.

20 THE WITNESS: The NCAA has set these
21 standards in place and Lia Thomas followed everything,
22 she has followed the rules and so it's really
23 unfortunate to see how much hate and lack of respect and
24 lack of kindness has been thrown her way. It's just

1 really hard stuff. I understand that athletes --- this
2 is new and I think each sport will be just looking at
3 the criteria they use and so, you know, they may tweak
4 some things along the way. But I don't think we can
5 take it out on Lia Thomas who has done everything that
6 has been asked of her.

7 BY ATTORNEY TRYON:

8 Q. Is there anything that you are aware of --- this
9 swimmer doesn't say I hate Lia Thomas. You just started
10 out talking about hate. Where do you get that from?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: From everything coming from
13 social media. And so she fears retribution and wants to
14 stay anonymous. Lia Thomas I feel has a lot of courage
15 to put herself out there knowing that there is going to
16 be a lot of people unhappy and a lot of pushback and,
17 you know, kind of couple of things that she says is just
18 referring to be who she is, ready to compete. And so
19 I'm acknowledging this is a really difficult situation,
20 right, for swimmers, for her teammates, but I think in
21 this case we have to wait to see what the NCAA and what
22 the USA Swim group decides to do and what they decide is
23 fair. And they have ongoing studies about how to be
24 inclusive and yet fair, and I'm confident that we can

1 keep pursuing that and there may be a learning curve for
2 us, right, or it may be that this is determined with
3 data over time that this is exactly what the criteria
4 needs to be.

5 BY ATTORNEY TRYON:

6 Q. So let's turn to the third page underneath that
7 picture, it says --- keep going down. I'm sorry. More
8 please, below the next picture. There we go. And right
9 --- so the paragraph, it says they are just proving,
10 once again, that they don't actually care about women
11 athletes, the swimmer said of the University of
12 Pennsylvania. They said they care and that they're here
13 for our emotions, but why do we have to be gracious
14 losers? Who are you you to tell me that I shouldn't
15 want to win because I do want to win. I'm swimming.
16 I'm dedicating more than 20 hours a week to the sport.
17 And obviously I want to win. You can't just tell me
18 that I should be happy with second place. I'm not. And
19 these people in Penn's administrative department who
20 just think that women should just roll over, it's
21 disturbing and it's reminiscent of the 1970s when the
22 are fighting for Title 9 and stuff like that. They
23 don't actually care about women at all. What would you
24 say to this swimmer?

1 ATTORNEY VEROFF: Objection.

2 THE WITNESS: I'd say I just recognize
3 that you're really frustrated with this and you don't
4 agree with it and that we --- well, I think, you know
5 when stuff is new and we don't have a lot of experience
6 or exposure to it, you know, that is really hard. I
7 just reflect back to my first semester at college and I
8 was just having lunch at a long table with lots of
9 women, and my roommate told me afterwards that every
10 person that we had lunch with, which was a lot, that
11 they were all gay. And I had no idea, never --- I grew
12 up in Texas, never talked to anybody, never knew anybody
13 that I knew was gay, was probably just naive.

14 And so down the road now, some people
15 that I'm closest to and love in the world are gay and it
16 is not anything that I give any thought to. It's like,
17 you know, crazy that is what happens over time. And I
18 see the same thing happening with transgender athletes.
19 We're just going to --- who would want to have the
20 courage to come out and just put your lives out there
21 and your family and do everything that they have to do,
22 too, and so I think we'll all just grow and we'll learn
23 more about what this experience is and we'll be able to
24 see, right, that here is just another athlete like me.

1 We have more in common than we don't. And I think over
2 time a lot of views will change and we'll just keep
3 working on trying to be as fair as we can on what the
4 criteria should be. But with this athlete I would say
5 nothing changes for you. What you are trying to do is
6 be the absolute very best that you can be, right, and so
7 let's keep working hard, let's keep seeing what you can
8 do. In swimming, that's a nice sport to just be able to
9 stay focused on your time and your performance and
10 proving your technique.

11 BY ATTORNEY TRYON:

12 Q. And so you are saying that this girl should be a
13 gracious loser, period, right?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: No. I'm saying if that
16 suggests that every transgender female that ever
17 competes in sports is going to be every female, right,
18 and that's just crazy, so --- and you know, I'm not
19 following it that closely, but Lia Thomas has lost races
20 as well. So just to say that she is here.

21 BY ATTORNEY TRYON:

22 Q. Right.

23 A. And I'm just a big loser for now because I can
24 never, you know, beat her, no, you just go out there and

1 compete because that's what sports is about.

2 Q. And that --- sorry, go ahead. I thought you
3 were finished.

4 A. Sorry. It's just out of, you know, some of
5 these rules are things that are just out of her control
6 so she needs to stay focused on what she can focus on.

7 Q. Is it your view that these girls that are
8 objecting to Lia Thomas being on the team are doing it
9 because they hate Lia Thomas?

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: No, no, I don't know any of
12 these athletes.

13 BY ATTORNEY TRYON:

14 Q. Let me ask you to take a look at Exhibit-11.
15 Let me know when you have it.

16 A. Okay, I have it.

17 Q. This is the opening paragraph and this says
18 Virginia Tech, fifth year Reka Gyorgy has released a
19 letter to NCAA addressing her opinion on the
20 organization's controversial transgender policy which
21 allowed Penn fifth year Lia Thomas to compete at the
22 NCAA championships last week. And if we can turn to the
23 page we can see the actual letter written by this
24 swimmer. It is in italics. And let me start with the

1 second paragraph. My name is Reka Gyorgy of Hungary. I
2 am a 2016 Rio Olympian, represented Virginia Tech for
3 the past five years, a two-time ACC champion, two time
4 all-American and three-time honorable mention
5 all-American. And then skipping down one paragraph she
6 says, Micka, if I'm saying her name right, says I'm
7 writing this letter right now in hopes that the NCAA
8 will open their eyes and change these rules in the
9 future. It doesn't promote our sport in a good way and
10 I think it's disrespectful against the biologically
11 female swimmers who are competing in the NCAA.

12 And then I want to skip down --- well, let's
13 just continue on the next paragraph. I don't want to
14 skip too much. I swam the 500 free at NCAA on
15 March 17th, 2022, where I got 17th which means I didn't
16 make it back to the finals and first alternate. I am a
17 fifth-year senior. I have been top 16 and top 8 and I
18 know how much a privilege it is to make finals at a big
19 --- at a meet this big. This is my last college meet
20 ever and I feel frustrated. It feels like that final
21 spot was taken away from me because of the NCAA's
22 decision to let someone who is not a biological female
23 compete. I know you can say I had the opportunity to
24 swim faster, make the top 16, but this situation makes

1 it a bit different and I can't help but be angry or sad.
2 It hurts me, my team and other women in the pool. One
3 spot was taken away from a girl that got 9th in the 500
4 free and didn't make it back to the A final, preventing
5 her from being an all-American. Every event that
6 transgender athletes competed in was one spot taken away
7 from biological females throughout the meet. Do you
8 disagree with Reka Gyorgy?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: I recognize that she is
11 very frustrated and feels that this decision wasn't
12 fair. You know, if we're looking at a bigger picture I
13 think sport organizations at the Olympic level,
14 international level, national level, are all invested in
15 keeping this value of inclusion, right, and trying to
16 balance that with fairness, and so I think it's
17 something these organizations are really going to keep
18 working on and that ---.

19 BY ATTORNEY TRYON:

20 Q. Sorry. Go ahead.

21 A. And that they are going to be able to find a
22 good spot that is somewhere --- somewhere in a place
23 that can be respectful, be it transfemale athletes and
24 also the female athletes on these teams.

1 Q. So you talk about a good spot. You don't know
2 what that good spot is.

3 Is that right?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: No, I don't --- sorry,
6 Julie, but I'm confident that there are many people
7 looking --- spending a lot of time and trying to figure
8 out how to answer some of these questions. In response
9 to this athlete, she's probably knocked out a lot of
10 other female athletes because maybe she had more
11 advantages along the way, right. Maybe her parents were
12 able to put her in good programs or good coaching and
13 things like that. So you know, it's just never like a
14 --- we like to just think what a sweet, perfect world it
15 is where everyone has the same opportunities and, you
16 know, there's just a lot that's not fair out there,
17 right, across for athletes, but I think we do the best
18 we can, which is what the NCAA has tried to do at this
19 point. And like I said, things may be changing, yeah,
20 but then --- but just to go back to the other side, for
21 the answer to be a blanket exclusion of all transgender
22 athletes at every level is not helping us move forward.

23 BY ATTORNEY TRYON:

24 Q. But you think even Lia Thomas should have been

1 allowed to participate in this swim meet, right?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: Yeah, I don't think it
4 matters what I think because I'm just not that emersed
5 in the sport to know everything. So whether it's ten
6 whatever it is nanomols per liter or whether, you know,
7 that's going to change, I don't know, but I think she
8 --- I respect her, she did everything the sport has
9 asked her to do. And she says she gets in the pool
10 every day and gives it her best effort. And those are
11 the kind of teammates I like to have, right, that are
12 that way. So I think everybody can --- her teammates
13 can look at this as maybe they can make each other
14 better and grow as human beings and make the world
15 better.

16 BY ATTORNEY TRYON:

17 Q. So again you think Lia Thomas's teammates should
18 just knuckle under and be happy about it and be
19 complete, is that right?

20 ATTORNEY VEROFF: Objection.

21 THE WITNESS: I feel sympathy and empathy
22 for so many athletes that are dealing with difficult
23 challenges, right, including these athletes, right, and
24 I just acknowledge, yeah, it must be tough, right,

1 you've just been doing your thing in your sport for a
2 long time and then you happen to be at the center stage
3 of some of this taking place, but, you know, it's just a
4 lot of challenges that athletes are dealing with on many
5 levels and so I don't think they are unique in, you
6 know, it's not like they are the only athletes that have
7 challenges to deal with.

8 BY ATTORNEY TRYON:

9 Q. Do you think that --- are you equating the fact
10 that this swimmer might have had some advantages in her
11 life to the fact that Lia Thomas had been --- had gone
12 through puberty and was maybe as much as a foot taller
13 than the other swimmers, those are just the same thing?

14 A. No.

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: I'm sorry. I'm not
17 equating those. I'm just simply saying what I feel as
18 the truth, that not everybody out there has all the same
19 opportunities, right, and access and great coaching and
20 facilities and everything else. So I think the NCAA is
21 trying to do the best that they can and everybody is
22 learning, right, so ---.

23 BY ATTORNEY TRYON:

24 Q. One of the things that we are learning that

1 these other girls, biological girls, are feeling very
2 marginalized. Does that count for anything?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: I think there is a lot that
5 our field of sports psychology can offer here in terms
6 of helping people work through these things. But I
7 would just go back to if we think the answer is to
8 exclude all transgender female athletes from competing,
9 then that's not right, and so we're going to have to
10 maneuver this, we are all going to have to be involved
11 in helping figure out how to move forward.

12 BY ATTORNEY TRYON:

13 Q. Let me just be clear, HB-3293 does not exclude
14 any athletes from competing in sports, does it?

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: Okay.

17 From my perception it does because BPJ is
18 a female and wants to compete with her female peers.

19 BY ATTORNEY TRYON:

20 Q. Okay.

21 A. So I don't see that as a good option for her to
22 compete with the males.

23 Q. What about Lia Thomas? I mean, Lia Thomas looks
24 like a male?

1 ATTORNEY VEROFF: Objection.

2 BY ATTORNEY TRYON:

3 Q. And couldn't he compete on the male team as he
4 had been for years and then the coach on that team
5 simply say, yeah, Lia Thomas now goes by she, but Lia
6 Thomas is going to compete on the boys teams and you
7 guys just need to respect that?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: As a cisgender female it's
10 hard to fathom that you wake up and you just feel like
11 you are in the wrong body, right. And the more I've
12 read over the years and the more I've heard people share
13 their stories, it must just be excruciatingly painful to
14 go through life and feel like that's your situation, and
15 so ---.

16 BY ATTORNEY TRYON:

17 Q. Right. And nobody is disagreeing with that,
18 nobody is contesting that, just the question --- the
19 right question is what's fair to everyone, not just to
20 the transgender person, but also to the biological
21 girls.

22 Isn't that the question?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Right. I think the

1 question is how do we balance that inclusion and
2 fairness.

3 BY ATTORNEY TRYON:

4 Q. I'm almost finished. I'm going to read you a
5 series of statements and please tell me if you agree or
6 disagree. Either one is fine. I just want to
7 understand your position. Or you may say I don't know.
8 That's fine too. The first statement, there are
9 physiological differences between natal males and natal
10 females.

11 ATTORNEY VEROFF: Objection. Apologies,
12 objection.

13 THE WITNESS: True.

14 ATTORNEY VEROFF: Sorry to --- Mr. Tryon,
15 are these your documents or are these statements coming
16 from a document somewhere.

17 ATTORNEY TRYON: No, these are my
18 statements.

19 ATTORNEY VEROFF: Thank you for the
20 clarification.

21 BY ATTORNEY TRYON:

22 Q. Second, there are physiological difference in
23 natal males and natal females that result in males
24 having a significant performance advantage over

1 similarly gifted age and trained females in nearly all
2 athletic events after puberty?

3 ATTORNEY VEROFF: Objection.

4 BY ATTORNEY TRYON:

5 Q. Agree or disagree?

6 ATTORNEY VEROFF: Objection.

7 THE WITNESS: I think there is exceptions
8 to this, but as a general rule that is true.

9 BY ATTORNEY TRYON:

10 Q. Number three, there are physiological
11 differences between males and females that result in
12 males having a significant performance advantage over
13 similarly gifted aged and trained females in nearly all
14 athletic events during puberty as opposed to after
15 puberty. Do you agree or disagree?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Yeah, I think it --- I
18 think that statement somewhat depends on what we define
19 as significant.

20 BY ATTORNEY TRYON:

21 Q. Fair enough. Four, there are physiological
22 differences between males and females that result in
23 males having a significant performance advantage over
24 similarly gifted aged and trained females in all

1 athletic events before puberty?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: Disagree.

4 BY ATTORNEY TRYON:

5 Q. Okay.

6 Number five, there is not scientific evidence
7 that any amount or duration of cross sex hormone
8 therapy, puberty blockers, androgen inhibitors or cross
9 sex hormones, eliminates all physiological advantages
10 that result in males performing better than females in
11 nearly all athletic events?

12 ATTORNEY VEROFF: Objection.

13 THE WITNESS: Okay.

14 And I'm just going to say that is beyond
15 my expertise and knowledge of that literature.

16 BY ATTORNEY TRYON:

17 Q. Males who have recently --- excuse me, males who
18 have received such therapy retain sufficient male
19 physiological traits that enhance athletic performance
20 vis-à-vis similarly aged females from a physiological
21 perspective more accurately characterized as male ---
22 agree or disagree?

23 COURT REPORTER: I'm sorry, Counsel. Can
24 you restate that question? I missed it.

1 ATTORNEY TRYON: Sure.

2 BY ATTORNEY TRYON:

3 Q. Males who have received such therapy that I
4 mentioned in question number five retain sufficient male
5 physiological traits that enhance athletic performance
6 vis-a-vis similarly aged females and are thus from a
7 physiological perspective more accurately characterized
8 as male and not female?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Again, I would say that
11 exceeds my expertise.

12 ATTORNEY TRYON: Fair enough. Let me go
13 off the record for just a few minutes. I think I've
14 covered everything, but I just want to make sure, and
15 then I will turn the time over to my co-Defendants if
16 they have any questions. So just give me five minutes
17 to go off the record. Is that all right with everyone?

18 ATTORNEY VEROFF: Thank you.

19 THE WITNESS: Yes.

20 VIDEOGRAPHER: Going off the record. The
21 time reads 4:45 p.m. Eastern Standard Time.

22 OFF VIDEOTAPE

23 ---

24 (WHEREUPON, A SHORT BREAK WAS TAKEN.)

1

2 ON VIDEOTAPE

3

VIDEOGRAPHER: We are back on the record.

4

The current time is 4:53 p.m. Eastern Standard Time.

5

ATTORNEY VEROFF: Excellent. Thank you.

6

Mr. Tryon, in our last exchange with Professor Fry you

7

read a series of statements and I asked you if these

8

statements were coming from any documents. You said,

9

no, these are my statements. And I just want to put on

10

the record that it appears that in some of those

11

statements you were reading from portions of the report

12

of Doctor Brown, one of Defendant's expert witnesses.

13

ATTORNEY TRYON: Well, in response, they

14

were generated from that, but they are not his

15

statements precisely, so --- and I think that I

16

represented that correctly if you are suggesting that I

17

misrepresented it.

18

ATTORNEY VEROFF: Thank you.

19

ATTORNEY TRYON: More over I don't think

20

I need to reference the source of my questions, but I

21

appreciate your statement.

22

ATTORNEY VEROFF: Thank you. I was just

23

clarifying, I thought that the answer that you gave

24

earlier was your statements and was inaccurate, and so I

1 just wanted to clarify that for the record.

2 ATTORNEY TRYON: Well, I believe it to be
3 accurate, but we'll agree to disagree perhaps.

4 BY ATTORNEY TRYON:

5 Q. So back to my questions, Professor Fry, it seems
6 that you have a specific view about transgender girls or
7 women participating on girls or women's teams.

8 Is that a fair statement?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Can you be more specific?

11 BY ATTORNEY TRYON:

12 Q. So you indicated numerous times of your belief,
13 generally, that trans --- that males who identify as
14 females should be allowed to participate on girls teams.

15 Right?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Again, I've stated that I'm
18 opposed to having a blanket exclusion policy for all
19 transfemale athletes.

20 BY ATTORNEY TRYON:

21 Q. When did you arrive at that position?

22 A. I'm not sure.

23 Q. Was it sometime in the past two years or
24 somewhere before then?

1 A. I'd say before then, but I'm not sure.

2 Q. Okay.

3 Do you have any idea at all what timeframe?

4 ATTORNEY VEROFF: Objection. Asked and
5 answered.

6 THE WITNESS: I'm really not sure. You
7 know, things just kind of blur over time.

8 BY ATTORNEY TRYON:

9 Q. Sure.

10 A. But I'm a fan of trying to let athletes
11 participate. So I'm not sure. I definitely learned
12 more over the last few years and may come from a more
13 knowledgeable position but I think it's one I felt for
14 sometime.

15 Q. For more than ten years?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: You know, it's just hard to
18 say. I don't remember this being part of the
19 conversation so much ten years ago, so if someone had
20 asked, yeah, I'm really not sure how to put a timeframe
21 on it.

22 BY ATTORNEY TRYON:

23 Q. Do you know when the first time is you heard of
24 the idea of transgender women participating or

1 transgender females participating on girls sports?

2 A. Again, I don't know. You know, I've been
3 attending sports psychology conferences for the last
4 30 years, and I don't remember the first time I sat in
5 on a session, or you know, began to learn more.

6 Q. Okay.

7 A. I really don't.

8 Q. Very good. What's the total compensation that
9 you received or that you've charged for in this case so
10 far?

11 A. In this case?

12 Q. Yes, in this case.

13 A. Yeah, I haven't turned in a bill, so I haven't
14 received anything.

15 Q. So how much have you incurred so far as fees in
16 this case?

17 A. Yeah, I've --- I think it's in the ballpark of
18 eight to ten hours probably prior to today.

19 Q. And what is your hourly rate?

20 A. \$250.

21 Q. And how about in the other three cases combined,
22 how much have you --- how many hours have you expended?

23 A. Probably eight to ten hours for the Connecticut
24 and Idaho cases together.

1 Q. And Florida?

2 A. In Florida, four.

3 Q. So when you first ---?

4 A. Sorry.

5 Q. Sorry, go ahead.

6 A. Four to six, and I billed for four, though, so I
7 received a thousand for Florida --- in the Florida case.

8 Q. Do I understand correctly then that the first
9 report that you did was for Connecticut?

10 A. We started that one and then there was ---
11 that's when COVID hit and the season was on hold. I
12 would have to go back and look. But I think the first
13 one that was filed ended up being Idaho even though we
14 started on Connecticut --- or I was part of the
15 Connecticut one.

16 Q. And you believe you are able to put this whole
17 report together in eight to ten hours for Connecticut?

18 ATTORNEY VEROFF: Objection.

19 THE WITNESS: Yes.

20 BY ATTORNEY TRYON:

21 Q. And your billing rate is the same for all of
22 them?

23 A. That's correct.

24 ATTORNEY TRYON: I don't have any further

1 questions. And so thank you for your time. It is
2 always stressful and so I appreciate it. I recognize
3 that it was stressful and that I do appreciate your
4 patience and your time. Thanks?

5 THE WITNESS: Thank you. Thanks very
6 much.

7 ATTORNEY SCRUGGS: I guess I will jump in
8 since none of the other Defendants want to.

9 ATTORNEY TRYON: Go ahead.

10 ATTORNEY SCRUGGS: Okay.

11 ---

12 EXAMINATION

13 ---

14 BY ATTORNEY SCRUGGS:

15 Q. Hello, Doctor Fry. How are you doing? Can you
16 hear me okay?

17 A. I can. Doing well. Thank you.

18 Q. So my name is Johnathan Scruggs. I'm an
19 attorney for the intervening Defendant, Lainey
20 Armistead, in this case. So I'm just going to ask you a
21 few questions. The good news is I won't ask many
22 questions as the prior testimony, and I can't since we
23 are limited in time. So I will try to go quick. But
24 the most important question actually I have for you is

1 what is your favorite barbecue place in Memphis? That's
2 the real question.

3 A. I guess I'd have to go with the Rendezvous. My
4 husband and I had our first date there. That was kind
5 of special.

6 Q. Well, I'm from there originally, so that's why I
7 asked.

8 A. Where are you from?

9 Q. I'm from Memphis, the Memphis area originally.

10 A. Okay.

11 Q. I'm more partial to central barbecue places, but
12 they're all good. So anyway, I want to turn a little
13 bit to paragraph 38 of your expert report. It is
14 Exhibit 2 there. And I want to turn you more toward the
15 end of that paragraph where it says when athletes are
16 excluded from participating in the sport or in a climate
17 where they do not feel accepted or respected, they do
18 not have the opportunity to reap these benefits. Now,
19 what benefits are you talking about there?

20 A. The benefits of participating in sport and to
21 --- yeah, sorry, let me read this one more time, this
22 paragraph, please.

23 Q. Absolutely.

24 A. Yeah, so I was referring to the benefits

1 highlighted throughout this statement that come from
2 having a chance to participate in a really positive
3 climate. But in this particular paragraph saying that
4 there's some advantages to females who are able to
5 participate, right, and might be more likely to go on to
6 college and those things.

7 Q. Let's just talk generally real quick. Can you
8 outline, kind of, just as general benefit beyond that
9 one specific one you mentioned?

10 ATTORNEY VEROFF: Objection. Asked and
11 answered.

12 BY ATTORNEY SCRUGGS:

13 Q. You can answer the question.

14 A. Okay. Well, throughout the statement these
15 benefits of being able to participate in sport, you
16 know, in a caring climate that, you know, people can
17 have fun, can have good experiences and good
18 relationships with coaches and athletes. They can have
19 --- just reap the physical benefits of being in better
20 health and --- both psychologically and physically.
21 They can express greater empathy for others, and you
22 know, better sportspersonship, right, really evaluate
23 being a respectful competitor and things like that.

24 Q. Now, in your last sentence in paragraph 38, you

1 don't have a timeframe mentioned in terms of when
2 athletes are excluded from participating in sports they
3 don't have the opportunity to reap these benefits. Do
4 you mean when they don't have an opportunity for a
5 substantial period of time or any type of loss of
6 participation for any period of time?

7 A. So when athletes are excluded from sport --- I'm
8 not sure I'm following you, but if they were excluded
9 for a day or two, are you saying would that be a big
10 deal or are they excluded for a whole season or
11 they ---?

12 Q. Sure. Sure. I'm just wondering if you can put
13 that in a timeframe?

14 A. No, but I would grant that if they're excluded
15 for a day or something like that, we wouldn't be here
16 talking about it probably, but yeah, on a bigger scale.

17 Q. But you would agree that if students were
18 excluded from participating in high school sports for
19 four years, they would miss out on the opportunities for
20 participating in youth sports?

21 A. Yes.

22 Q. And I assume the same is for a year.

23 Correct?

24 A. Yes.

1 Q. Let's say there's a policy as far as males with
2 female gender identities to undergo testosterone
3 suppression for a year before they can participate on
4 the girl's team, would that policy force at least some
5 athletes to miss out on some opportunities associated
6 with youth sports?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: It could.

9 BY ATTORNEY SCRUGGS:

10 Q. Well, could you envision where it wouldn't?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: I'm just thinking they
13 might have other options or could play on a co-gender
14 team that's maybe not part of their school, what they
15 really wanted to do was on their school, but there could
16 be another possibility.

17 BY ATTORNEY SCRUGGS:

18 Q. Yeah, so being a situation where they only
19 wanted to be on their school and had to undergo
20 testosterone suppression for a year to do so, they would
21 lose out on those benefits for that year.

22 Correct?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Uh-huh (yes).

1 BY ATTORNEY SCRUGGS:

2 Q. Now, earlier we discussed HB-3293 the law that
3 is at issue in the case. Now, I don't want to retread a
4 lot of old ground, but I just want to put it in your
5 words. So what is the problem, in your opinion, with
6 this law?

7 ATTORNEY VEROFF: Objection as to scope.

8 THE WITNESS: I think it's --- you know,
9 provides a blanket of exclusion of transgender female
10 athletes from participating in the secondary and college
11 level, and that is unfortunate and harmful.

12 BY ATTORNEY SCRUGGS:

13 Q. Ma'am, I'm sorry your answer broke up there. I
14 think my internet connection was a bit faulty. Can I
15 ask the court reporter to read back that answer?

16 ---

17 (WHEREUPON, COURT REPORTER READS BACK PREVIOUS ANSWER)

18 ---

19 BY ATTORNEY SCRUGGS:

20 Q. And how harmful exactly?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: It is harmful, because I
23 think what school districts are trying to do is help
24 every child reach their own potential and bring out

1 their best and but we have these activities available
2 but we are telling a particular group of kids that you
3 can't participate in these activities and these maybe
4 very important to them and be extremely valuable part of
5 their educational experience through the secondary
6 schools.

7 BY ATTORNEY SCRUGGS:

8 Q. Got it. Got it. And now earlier in your
9 testimony you mentioned you didn't think it's a problem
10 if a male --- that would be a male that was excluded
11 from, for example, the women's girl track team.

12 Do you remember that?

13 ATTORNEY VEROFF: Objection.

14 THE WITNESS: I'm sorry, did you say a
15 male who identifies as a male?

16 BY ATTORNEY SCRUGGS:

17 Q. Yes, yes. From the women's sports team?

18 A. Right. The team for the females is for the
19 females, right, so I would agree.

20 Q. So you don't think HB-3293 is not problematic in
21 that situation?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: Right.

24 BY ATTORNEY SCRUGGS:

1 Q. And that's true even if that male loses out on
2 an opportunity from participating on the girl's track
3 team?

4 ATTORNEY VEROFF: Objection.

5 THE WITNESS: Right. Right. But they're
6 identifying as a male and can perform on a --- can
7 participate on the male's team.

8 BY ATTORNEY SCRUGGS:

9 Q. So they can participate on the male's team and
10 that is why they talk about it?

11 ATTORNEY VEROFF: Objection.

12 THE WITNESS: Right.

13 BY ATTORNEY SCRUGGS:

14 Q. What if that male athlete is not fast enough to
15 run on the male team?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: In say cross-country
18 or ---?

19 BY ATTORNEY SCRUGGS:

20 Q. Yes. On cross country is not fast enough for
21 the male team, cannot run on the male team, should that
22 male at least be able to participate on the female track
23 team?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: Right, no, no. No people
2 at tryouts do not make teams. But he is a male,
3 identifying as a male then he should stick with that
4 team.

5 BY ATTORNEY SCRUGGS:

6 Q. So in that situation, it doesn't matter, that
7 male athlete doesn't have another option?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: Right.

10 BY ATTORNEY SCRUGGS:

11 Q. Okay.

12 Wouldn't it be more inclusive to allow the man
13 to participate on the female track team?

14 ATTORNEY VEROFF: Objection.

15 THE WITNESS: I don't see it like that,
16 right. There's a male track team and a male can try out
17 for the that. And the good news is with cross-country
18 they can handle a lot of athletes so often there is not
19 a cut policy in cross-country.

20 BY ATTORNEY SCRUGGS:

21 Q. Well, I think I can easily give a scenario where
22 the male can't make the male track team, but there is an
23 open slot on the female track team, so that males who
24 identify as males, should that person be able to

1 participate on the female track team?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: No. Sorry. No. No, I
4 don't think so.

5 BY ATTORNEY SCRUGGS:

6 Q. Well, why doesn't --- why shouldn't we value
7 their participation on an athletic team?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: I don't think we're saying
10 we wouldn't value that, right. That happens all the
11 time.

12 BY ATTORNEY SCRUGGS:

13 Q. Yeah. I'm saying why don't we value --- why
14 don't we promote their participation in athletics and
15 allow them to participate on the female track team?

16 ATTORNEY VEROFF: Objection. And please
17 let the witness finish her answer.

18 THE WITNESS: I think there's a team for
19 this male athlete to at least try out for and go for and
20 so I don't see the issue that we're not being inclusive
21 and giving this athlete an opportunity to try out for
22 that team. Across teams and across schools, many
23 athletes try out for sports and don't make the team.

24 BY ATTORNEY SCRUGGS:

1 Q. Well, BPJ can try out for the male track team.

2 Correct?

3 ATTORNEY VEROFF: Objection.

4 THE WITNESS: That doesn't seem to be a
5 viable option since BPJ is a female.

6 BY ATTORNEY SCRUGGS:

7 Q. Gotcha. Okay. Let me turn you toward
8 paragraph 37 in your expert report, again I'm going to
9 ask you about the second question --- the second -- or
10 the last sentence, excuse me, there, where it says if
11 transgender students are arbitrarily excluded from these
12 sports they are in turn deprived of this positive
13 experience as an outcome and their teammates are
14 deprived of a generally optimal sport experience. Did I
15 read that correctly?

16 A. Yes, I think so.

17 Q. Now, would you agree that if we just said any
18 student is excluded from youth sports, they are deprived
19 of those positive experiences and outcomes and their
20 teammates are deprived of a generally optimal sports
21 experience?

22 A. Yeah, I'm not thinking of a situation where that
23 is not the case right now.

24 Q. So would you agree that if it said if any

1 student, no matter their gender identity, were
2 arbitrarily excluded from youth sports, they are
3 deprived of those positive experiences and outcomes?

4 A. I would just add that based on their gender
5 identity, right. So you could have a trans female
6 athlete who tries out for a team and doesn't make it,
7 right, we're not including that in the same ballpark
8 here with just having a blanket statement that
9 transfemale athletes may not participate.

10 Q. I guess I'm not really following you. But
11 again, you would agree that if any students are
12 arbitrarily excluded, they reap the benefits from youth
13 sports?

14 ATTORNEY VEROFF: Objection. Asked and
15 answered.

16 THE WITNESS: No, I wouldn't agree with
17 that. I would need the context of that because the
18 example I'm giving is transgender female athlete tries
19 out for a female team and doesn't make it, right, and so
20 would be excluded for that reason, that they're --- this
21 team is limited in how many positions they have and they
22 --- particular, you know, some kids try and don't make
23 the team.

24 BY ATTORNEY SCRUGGS:

1 Q. Let me turn you to your Declaration, your
2 initial expert Declaration, I think it's Exhibit 1, and
3 then let me turn you to paragraph 44 and just read the
4 second sentence, which says, if athletes are arbitrarily
5 excluded from youth sports, they are, in turn, deprived
6 of those positive experiences and outcomes and their
7 teammates are deprived of a generally task involving and
8 caring sports climate. Do you see that?

9 A. I do.

10 Q. And are you referring to all athletes there?

11 A. I think the point is arbitrarily there.

12 Q. Uh-huh (yes).

13 A. Right, then --- so if we're just saying we
14 should have a cut policy because that's not fair, right,
15 that's not what I'm insinuating here, right, just saying
16 but to have this --- make this decision that as a
17 blanket statement that certain group of athletes can't
18 participate, can't try out, can't participate, then,
19 yes, I think the statement is true.

20 Q. Yes, I think we are saying the same thing. Let
21 me ask it another way. Again, focusing on the
22 arbitrarily, if all athletes --- if any athlete is
23 arbitrarily excluded, that creates a problem in your
24 mind?

1 ATTORNEY VEROFF: Objection. Asked and
2 answered.

3 THE WITNESS: Yes, I think it changes the
4 meaning to say if any athletes, any athlete under any
5 circumstances, but I just mean --- athletes here.

6 BY ATTORNEY SCRUGGS:

7 Q. Yeah, I'm not saying under any circumstances. I
8 guess what I'm trying to figure out is what role does an
9 athlete's gender identity play in that sentence. It
10 says if athletes were arbitrarily excluded, so I assume
11 there could be a male athlete who identifies as male.
12 If that athlete is arbitrarily excluded, that creates a
13 problem that you identify in that paragraph?

14 A. I'm not familiar with --- sorry, Julie.

15 ATTORNEY VEROFF: Objection.

16 THE WITNESS: I'm not familiar with that
17 case where the male athlete is arbitrarily prevented
18 from participating. I'm not sure what you're referring
19 to there.

20 BY ATTORNEY SCRUGGS:

21 Q. Well, let's think about a situation on the
22 sports team where a coach cuts an athlete, a female
23 athlete who identifies as female and instead it favors
24 the coach's own daughter, for example. You would

1 consider that an arbitrary exclusion, right?

2 ATTORNEY VEROFF: Objection.

3 THE WITNESS: No. We'd have to know a
4 whole lot more about that situation.

5 BY ATTORNEY SCRUGGS:

6 Q. Okay.

7 A. Maybe the coach's daughter deserves to be on
8 the team and if the team can only handle so many maybe
9 that's how it had to be. But to make the assumption
10 that because it was the coach's daughter that it wasn't
11 a fair process ---.

12 Q. I'm assuming that was the only reason that the
13 athletes have been chosen and someone else is excluded?

14 A. In other words, if a coach just says I don't
15 like you, I don't want you on my team.

16 Q. Exactly.

17 A. It seems like there would be guidelines in place
18 for someone to appeal that to the Athletic Director and
19 so on, and yeah, that doesn't sound like it'd be very
20 fair to not give someone a chance.

21 Q. Exactly. And that kind of principle applies
22 regardless of someone's gender identity?

23 ATTORNEY VEROFF: Objection.

24 THE WITNESS: Okay. Yeah. If I'm

1 following you, yes, I think.

2 BY ATTORNEY SCRUGGS:

3 Q. Yeah. Now, switching gears slightly, you
4 mentioned --- to go back --- let's go back actually to
5 your expert report, paragraph 37. And again, that last
6 sentence that transgender students are arbitrarily
7 excluded, what is the situation when a transgender
8 student is not arbitrarily excluded from youth sports
9 --- or let me strike that. Let me rephrase.

10 What is a situation, to use your term,
11 transgender student doesn't make the sports team and
12 that's not arbitrary? Did you hear that question?

13 A. Sorry, I thought the court reporter was asking
14 for it to be repeated or something.

15 Q. No. I'm sorry.

16 A. No, that's okay. I lost something, okay. So
17 you're saying, for example, a transfemale athlete tries
18 out for a female athletic team and doesn't make it?.

19 Q. I'm asking is that an example of a non-arbitrary
20 exclusion?

21 A. Yes. In general, I would say, yes, without
22 having more details, all right, but it doesn't ---
23 transathletes, right, would just have the right to try
24 out, the right to, you know, potentially participate,

1 but it doesn't mean that everyone would make the team.

2 Q. Got it. So that situation where you have the
3 male athlete who identifies as female, right, and just
4 doesn't make the team, do they lose out on the
5 experiences and opportunities associated with
6 participating in sports?

7 ATTORNEY VEROFF: Objection.

8 THE WITNESS: Yeah, it depends. You
9 know, some might participate in another sport, right, or
10 find another avenue, but the potential is there for
11 that, yeah.

12 BY ATTORNEY SCRUGGS:

13 Q. So in a situation where there is no other
14 opportunity or avenue, but we are saying that athlete
15 just can't make that team because they just don't have
16 that athletic skill, in that situation they would lose
17 out on the opportunity outcomes associated with
18 participating on that team?

19 ATTORNEY VEROFF: Objection.

20 BY ATTORNEY SCRUGGS

21 Q. So the word arbitrary doesn't really determine
22 whether someone benefits from the experience and
23 outcomes of participating in youth sports?

24 ATTORNEY VEROFF: Objection.

1 THE WITNESS: Right. Inherent within
2 sports, unfortunately, particularly at the secondary
3 level, is that not all schools are in a position to let
4 every child participant who wants to, right, and so
5 there is a cut policy. Personally, because of
6 everything I've outlined today, I wish every school
7 district was doing everything possible to include as
8 many kids, as many athletes as they could, right, but
9 that's not the reality. Boys and girls try out for
10 teams and they get --- you know, they don't make it. I
11 just saw this clip this weekend, Billy Mills, Olympic
12 gold medalist, right, he was cut from his track team as
13 a freshman, right. So that happens. And I'm
14 distinguishing that from just arbitrarily saying this
15 whole group of athletes, you don't have the right to
16 even try out for the team.

17 BY ATTORNEY SCRUGGS:

18 Q. But in terms of taking advantage of the benefits
19 associated with sports, it's not so much why someone is
20 excluded but just the fact that they are excluded?

21 ATTORNEY VEROFF: Objection, asked and
22 answered.

23 THE WITNESS: I would say it's important
24 to consider why they are excluded.

1 BY ATTORNEY SCRUGGS:

2 Q. Okay.

3 And why is that important?

4 A. Because I believe it's harmful to just have a
5 blanket exclusion of a group of athletes like
6 transathletes to say you don't have the right to
7 participate in your school activities, to try out,
8 right, and to be part of these teams and activities.

9 Q. Well, I'm asking with respect to your expertise
10 about benefiting from the outcome and advantages of
11 participating in sports. It seems to me that any type
12 of exclusion from sports was by definition maybe cannot
13 take advantage of this opportunity to benefit. Isn't
14 that correct?

15 ATTORNEY VEROFF: Objection. Asked and
16 answered.

17 THE WITNESS: No. I'm speaking
18 specifically about sport because that's what's on the
19 table in this case, but you know, somebody else might
20 really experience a caring task involving climate and
21 have great opportunities in other activities of school
22 that they're passionate about, like school or music,
23 right. But if like BPJ, if her passion is sport,
24 wanting to run track, right, then --- and there's just a

1 blanket statement saying you're not --- you can't, you
2 can't try out for the women's track team, right, then
3 that would prevent her from the potential benefits that
4 she could be reaping, right, and just enhancing her
5 school experience.

6 Q. Got it. Like the male that identifies as male
7 and can't participate on either the males sports team or
8 the female sports team?

9 ATTORNEY VEROFF: Objection.

10 THE WITNESS: Right. The distinction is
11 that he can participate on the male team. He can try
12 out, right, just like the transgender female can try out
13 for the women's team, but there's no guarantee that the
14 athletes make the team.

15 BY ATTORNEY SCRUGGS:

16 Q. Exactly. So I mentioned to you that I represent
17 Lainey Armistead. And I will represent to you that she
18 is a female soccer player on the West Virginia State
19 University soccer team. Now, I think earlier you
20 mentioned that you reviewed some documents in the case.
21 Did you happen to run across any documents mentioning
22 Ms. Armistead?

23 A. Yes, I read her statement. It's been a little
24 bit of time, so I might need to be refreshed on it, but

1 I did take a look at that.

2 Q. Okay.

3 Well, let me go to Exhibit --- paragraph 41 of
4 your expert report.

5 VIDEOGRAPHER: What number did you say,
6 Counsel?

7 ATTORNEY SCRUGGS: Paragraph 41.

8 VIDEOGRAPHER: Thank you.

9 BY ATTORNEY SCRUGGS:

10 Q. And it says the climate of youth sport must be
11 geared to include all participants so the teams are more
12 likely to help every athlete maximize their potential.
13 From an educational perspective it is optimal to
14 encourage all athletes to do the best they can and to
15 help all athletes enjoy the sport that they love.

16 Did I read that correctly?

17 A. Yes.

18 Q. So I assume that would include Ms. Armistead in
19 your opinion.

20 Correct?

21 ATTORNEY VEROFF: Objection.

22 THE WITNESS: I think some of the ideas
23 hold, but you know, we were referring here to the
24 climate of youth sport. Typically in our field we

1 consider youth sport through high school and we would
2 separate that from collegiate sport.

3 BY ATTORNEY SCRUGGS:

4 Q. Do you think it would be wrong to say that we
5 should not --- you know, strike that.

6 Do you think that we shouldn't gear athletic or
7 college sports to include all participants?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: You know, at a place like
10 the University of Kansas where I am, we have different
11 levels and so you have the D-1 sport, right, and then
12 you have club sport where people who don't have the
13 skill level or the experience to play a D-1 sport can
14 try out for the club sport those --- I think there's
15 like 40 teams or maybe more we have, and the skill level
16 among those sport club teams really varies, right. You
17 got some, that are not hit and giggle, you know, just
18 everyone's welcome and they don't have --- you know, a
19 cut policy. Others are pretty competitive and maybe
20 competing at national levels.

21 But you have another level of intermurals
22 that is open to every student on campus can sign up,
23 because they want to play whatever it is basketball or
24 indoor soccer or something. So I think ideally, you

1 know, universities should offer lots of opportunities
2 for people to participate in sport.

3 It is not realistic that every student on
4 campus could participate in you know D-1 sport or
5 whatever the level, you know, a school might have.

6 BY ATTORNEY SCRUGGS:

7 Q. So Doctor, if we had a male that identifies as
8 female, it wouldn't be problematic to exclude that
9 person from the female collegiate track team?

10 ATTORNEY VEROFF: Objection.

11 THE WITNESS: I think it depends on what
12 the rules are in place, but if this transgender female
13 meets the criteria and participates, right, that that is
14 great.

15 BY ATTORNEY SCRUGGS:

16 Q. Well, again, assuming the rules are --- the
17 rules of West Virginia are in place and says we now
18 require all natal males to participate on the male team
19 rather than on the female team, why can't we just tell
20 the male college athletes to identify as females, they
21 can go play on the club sports club team?

22 ATTORNEY VEROFF: Objection.

23 THE WITNESS: I think the transgender
24 female athlete should have the right to participate on

1 whichever of those levels that they want to participate
2 on. Right. The female D-1 team the sports team, the
3 intermural team, they should have the right to try out
4 as long as they meet the criteria that's in place.

5 BY ATTORNEY SCRUGGS:

6 Q. Do you feel that Ms. Armistead should have the
7 right to participate on the female women's soccer team?

8 ATTORNEY VEROFF: Objection.

9 THE WITNESS: Yes.

10 BY ATTORNEY SCRUGGS:

11 Q. Doctor Fry, you would agree that if Ms.
12 Armistead lost her spot on the soccer team to a male
13 soccer play who identifies as female, Ms. Armistead
14 would be deprived of the positive experiences associated
15 with participating on that soccer team?

16 ATTORNEY VEROFF: Objection.

17 THE WITNESS: Right. If the transgender
18 female is meeting the criteria that's in place by the
19 NCAA, right, and then --- and makes the team and someone
20 else doesn't make the team, right, I would say that's
21 --- that's part of sport just like Ms. Armistead, I
22 think, right, if she tried out and she didn't make the
23 team because there's other cisfemale athletes that had a
24 better performance or made the team, but either way she

1 would be missing out on the benefits if she didn't make
2 the team.

3 BY ATTORNEY SCRUGGS:

4 Q. And that's not my point. I understand your
5 argument. I understand that, as a matter of fact, she
6 would lose out on the benefits and opportunities for
7 participating on the sports team.

8 ATTORNEY VEROFF: I'm going to object to
9 Counsel testifying.

10 BY ATTORNEY SCRUGGS:

11 Q. I'm asking if you agree with that?

12 ATTORNEY VEROFF: Objection to the
13 question.

14 THE WITNESS: Yeah, I'm agreeing that
15 athletes try out for teams, and when they don't make it,
16 it's hard for them to reap the benefits of being part of
17 their team if they, you know, don't participate and
18 aren't part of that.

19 ATTORNEY SCRUGGS: I understand. I have
20 no further questions. Thank you, Dr. Fry.

21 ATTORNEY CROPP: This is Jeffrey Cropp,
22 Counsel for Defendant Harrison County Board of
23 Education, and Superintendant Dora Stutler. I have no
24 questions.

1 ATTORNEY GREEN: This is Roberta Green on
2 behalf of West Virginia Secondary School Activities
3 Commission. I have no questions.

4 ATTORNEY MORGAN: This is Kelly Morgan on
5 behalf of the West Virginia Board of Education and
6 Superintendant Burch. I have no questions.

7 ATTORNEY TRYON: And this is Dave Tryon.
8 I have no further questions, unless the Defense Counsel
9 does. Excuse me, Plaintiff's Counsel.

10 ATTORNEY VEROFF: No, we don't have any
11 further questions. The witness will read and sign
12 later.

13 VIDEOGRAPHER: Okay.

14 If there's no further questions that
15 concludes this deposition. The current time reads
16 5:38 p.m. Eastern Standard Time.

17 * * * * *

18 VIDEOTAPED DEPOSITION CONCLUDED AT 5:38 P.M.

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COMMONWEALTH OF PENNSYLVANIA)

COUNTY OF PHILADELPHIA)

CERTIFICATE

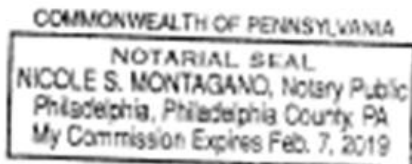
I, Nicole Montagano, a Notary Public in and for the Commonwealth of Pennsylvania, do hereby certify:

That the foregoing proceedings, deposition of Mary D. Fry, Ph.D., was reported by me on March 29, 2022 and that I, Nicole Montagano, read this transcript, and that I attest that this transcript is a true and accurate record of the proceeding.

That the witness was first duly sworn to testify to the truth, the whole truth, and nothing but the truth and that the foregoing deposition was taken at the time and place stated herein.

I further certify that I am not a relative, employee or attorney of any of the parties, nor a relative or employee of counsel, and that I am in no way interested directly or indirectly in this action.

Dated the 4 day of April, 2022



Nicole Montagano
Nicole S. Montagano,
Court Reporter|

Exhibit 29

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

B.P.J., by her next friend and mother,
HEATHER JACKSON,

Plaintiff,

vs.

WEST VIRGINIA STATE BOARD OF
EDUCATION; HARRISON COUNTY BOARD
OF EDUCATION; WEST VIRGINIA
SECONDARY SCHOOLS ACTIVITIES
COMMISSION; W. CLAYTON BURCH, in his
official capacity as State Superintendent, DORA
STUTLER, in her official capacity as the
Harrison County Superintendent, and the
STATE OF WEST VIRGINIA,

Defendants,

and

LAINY ARMISTEAD,

Defendant-Intervenor.

Case No. 2:21-cv-00316

Hon. Joseph R. Goodwin

DECLARATION OF GREGORY A. BROWN, PH.D., FACSM

I, Dr. Gregory A. Brown, pursuant to 28 U.S. Code § 1746, declare under penalty of perjury under the laws of the United States of America that the facts contained in my Expert Declaration of Gregory A. Brown, Ph.D., FACSM in the Case of B.P.J. v. West Virginia State Board of Education, attached hereto, are true and correct to the best of my knowledge and belief, and that the opinions expressed therein represent my own expert opinions.

Executed on February 23, 2022.



Gregory A. Brown

G. Brown

Expert Report, B.P.J. v. WV BOE et al.

G. Brown

Expert Report, B.P.J. v. WV BOE et al.

Expert Report of
Gregory A Brown, Ph.D. FACSM
In the case of B.P.J. vs. West Virginia State Board of Education.

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Personal Qualifications and Disclosure

I serve as Professor of Exercise Science in the Department of Kinesiology and Sport Sciences at the University of Nebraska Kearney, where I teach classes in Exercise Physiology among other topics. I am also the Director of the General Studies program. I have served as a tenured (and nontenured) professor at universities since 2002.

In August 2002, I received a Doctor of Philosophy degree from Iowa State University, where I majored in Health and Human Performance, with an emphasis in the Biological Bases of Physical Activity. In May 1999, I received a Master of Science degree from Iowa State University, where I majored in Exercise and Sport Science, with an emphasis in Exercise Physiology.

I have received many awards over the years, including the Mortar Board Faculty Excellence Honors Award, College of Education Outstanding Scholarship / Research Award, and the College of Education Award for Faculty Mentoring of Undergraduate Student Research. I have authored more than 40 refereed publications and more than 50 refereed presentations in the field of Exercise Science. I have authored chapters for multiple books in the field of Exercise Science. And I have served as a peer reviewer for over 25 professional journals, including *The American Journal of Physiology*, the *International Journal of Exercise Science*, the *Journal of Strength and Conditioning Research*, and *The Journal of Applied Physiology*.

My areas of research have included the endocrine response to testosterone prohormone supplements in men and women, the effects of testosterone prohormone supplements on health and the adaptations to strength training in men, the effects of energy drinks on the physiological response to exercise, and assessment of various athletic training modes in males and females. Articles that I have published that are closely related to topics that I discuss in this white paper include:

- Studies of the effect of ingestion of a testosterone precursor on circulating testosterone levels in young men. Douglas S. King, Rick L. Sharp, Matthew D. Vukovich, Gregory A. Brown, et al., *Effect of Oral Androstenedione on Serum Testosterone and Adaptations to Resistance Training in Young Men: A Randomized Controlled Trial*, JAMA 281: 2020-2028 (1999); G. A. Brown, M. A. Vukovich, et al., *Effects of Anabolic Precursors on Serum Testosterone Concentrations and Adaptations to Resistance Training in Young Men*, INT J SPORT NUTR EXERC METAB 10: 340-359 (2000).
- A study of the effect of ingestion of that same testosterone precursor on circulating testosterone levels in young women. G. A. Brown, J. C. Dewey, et

al., *Changes in Serum Testosterone and Estradiol Concentrations Following Acute Androstenedione Ingestion in Young Women*, HORM METAB RES 36: 62-66 (2004.)

- A study finding (among other things) that body height, body mass, vertical jump height, maximal oxygen consumption, and leg press maximal strength were higher in a group of physically active men than comparably active women, while the women had higher percent body fat. G. A. Brown, Michael W. Ray, et al., *Oxygen Consumption, Heart Rate, and Blood Lactate Responses to an Acute Bout of Plyometric Depth Jumps in College-Aged Men And Women*, J. STRENGTH COND RES 24: 2475-2482 (2010).
- A study finding (among other things) that height, body mass, and maximal oxygen consumption were higher in a group of male NCAA Division 2 distance runners, while women NCAA Division 2 distance runners had higher percent body fat. Furthermore, these male athletes had a faster mean competitive running speed (~3.44 min/km) than women (~3.88 min/km), even though the men ran 10 km while the women ran 6 km. Katherine Semin, Alvah C. Stahlnecker, Kate A. Heelan, G. A. Brown, et al, *Discrepancy Between Training, Competition and Laboratory Measures of Maximum Heart Rate in NCAA Division 2 Distance Runners*, JOURNAL OF SPORTS SCIENCE AND MEDICINE 7: 455-460 (2008).
- A presentation at the 2021 American Physiological Society New Trends in Sex and Gender Medicine Conference entitled “Transwomen Competing in Women’s Sports: What We Know and What We Don’t”. I have also authored an August 2021 entry for the American Physiological Society Physiology Educators Community of Practice Blog (PECOP Blog) titled “The Olympics, Sex, and Gender in the Physiology Classroom.”

A list of my published scholarly work for the past 10 years appears as an Appendix.

Purpose of this Declaration

I have been asked by counsel for Defendant State of West Virginia and Intervenor Defendant Lainey Armistead in the matter of *B.P.J. by her next friend and mother Heather Jackson, v. State of West Virginia State Board of Education, et al.* to offer my opinions about the following: (a) whether males have inherent advantages in athletic performance over females, and if so the scale and physiological basis of those advantages, to the extent currently understood by science and (b) whether the sex-based performance advantage enjoyed by males is eliminated if feminizing hormones are administered to male athletes who identify as transgender (and in the case of prepubertal children, whether puberty blockers eliminate the advantage). In this declaration, when I use the terms “boy” or “male,” I am referring to biological males based on the individual’s reproductive biology and genetics as determined at birth. Similarly, when I use the terms “girl” or “female,” I am referring to biological females based on the individual’s reproductive biology and genetics as determined at birth. When I use the term transgender, I am referring to persons who are males or females, but who identify as a member of the opposite sex.

I have previously provided expert information in cases similar to this one in the form of a written declaration and a deposition in the case of *Soule vs. CIAC* in the state of Connecticut, and in the form of a written declaration in the case of *Hecox vs. Little* in the state of Idaho. I have not previously testified as an expert in any trials.

The opinions I express in this declaration are my own, and do not necessarily reflect the opinions of my employer, the University of Nebraska.

I have been compensated for my time serving as an expert in this case at the rate of \$150 per hour. My compensation does not depend on the outcome in the case.

Overview

In this declaration, I explore three important questions relevant to current discussions and policy decisions concerning inclusion of transgender individuals in women's athletic competitions. Based on my professional familiarity with exercise physiology and my review of the currently available science, including that contained in the many academic sources I cite in this report, I set out and explain three basic conclusions:

- At the level of (a) elite, (b) collegiate, (c) scholastic, and (d) recreational competition, men, adolescent boys, or male children, have an advantage over equally aged, gifted, and trained women, adolescent girls, or female children in almost all athletic events;
- Biological male physiology is the basis for the performance advantage that men, adolescent boys, or male children have over women, adolescent girls, or female children in almost all athletic events; and
- The administration of androgen inhibitors and cross-sex hormones to men or adolescent boys after the onset of male puberty does not eliminate the performance advantage that men and adolescent boys have over women and adolescent girls in almost all athletic events. Likewise, there is no published scientific evidence that the administration of puberty blockers to males before puberty eliminates the pre-existing athletic advantage that prepubertal males have over prepubertal females in almost all athletic events.

In short summary, men, adolescent boys, and prepubertal male children perform better in almost all sports than women, adolescent girls, and prepubertal female children because of their inherent physiological advantages. In general, men, adolescent boys, and prepubertal male children, can run faster, output more muscular power, jump higher, and possess greater muscular endurance than women, adolescent girls, and prepubertal female children. These advantages become greater during and after male puberty, but they exist before puberty.

Further, while after the onset of puberty males are on average taller and heavier than females, a male performance advantage over females has been measured in weightlifting competitions even between males and females matched for body mass.

Male advantages in measurements of body composition, tests of physical fitness, and athletic performance have also been shown in children before puberty. These advantages are magnified during puberty, triggered in large part by the higher testosterone concentrations in men, and adolescent boys, after the onset of

male puberty. Under the influence of these higher testosterone levels, adolescent boys and young men develop even more muscle mass, greater muscle strength, less body fat, higher bone mineral density, greater bone strength, higher hemoglobin concentrations, larger hearts and larger coronary blood vessels, and larger overall statures than women. In addition, maximal oxygen consumption ($VO_2\text{max}$), which correlates to ~30-40% of success in endurance sports, is higher in both elite and average men and boys than in comparable women and girls when measured in regard to absolute volume of oxygen consumed and when measured relative to body mass.

Although androgen deprivation (that is, testosterone suppression) may modestly decrease some physiological advantages that men and adolescent boys have over women and adolescent girls, it cannot fully or even largely eliminate those physiological advantages once an individual has passed through male puberty.

Evidence and Conclusions

I. The scientific reality of biological sex

1. The scientific starting point for the issues addressed in this report is the biological fact of dimorphic sex in the human species. It is now well recognized that dimorphic sex is so fundamental to human development that, as stated in a recent position paper issued by the Endocrine Society, it “must be considered in the design and analysis of human and animal research. . . . Sex is dichotomous, with sex determination in the fertilized zygote stemming from unequal expression of sex chromosomal genes.” (Bhargava et al. 2021 at 220). As stated by Sax (2002 at 177), “More than 99.98% of humans are either male or female.” All humans who do not suffer from some genetic or developmental disorder are unambiguously male or female.

2. Although sex and gender are used interchangeably in common conversation, government documents, and in the scientific literature, the American Psychological Association defines sex as “physical and biological traits” that “distinguish between males and females” whereas gender “implies the psychological, behavioral, social, and cultural aspects of being male or female (i.e., masculinity or femininity)” (<https://dictionary.apa.org>, accessed January 14, 2022). The concept that sex is an important biological factor determined at conception is a well-established scientific fact that is supported by statements from a number of respected organizations including, but not limited to, the Endocrine Society (Bhargava et al. 2021 at 220), the American Physiological Society (Shah 2014), the Institute of Medicine, and the National Institutes of Health (Miller 2014 at H781-82). Collectively, these and other organizations have stated that every cell has a sex

and every system in the body is influenced by sex. Indeed, “sex often influences gender, but gender cannot influence sex.” (Bhargava 2021 at 228.)

3. To further explain: “The classical biological definition of the **2 sexes** is that females have ovaries and make larger female gametes (eggs), whereas males have testes and make smaller male gametes (sperm) ... the definition can be extended to the ovaries and testes, and in this way the categories—female and male—can be applied also to individuals who have gonads but do not make gametes ... sex is dichotomous because of the different roles of each sex in reproduction.” (Bhargava 2021 at 221.) Furthermore, “sex determination begins with the inheritance of XX or XY chromosomes” (Bhargava 2021 at 221.) And, “Phenotypic sex differences develop in XX and XY embryos as soon as transcription begins. The categories of X and Y genes that are unequally represented or expressed in male and female mammalian zygotes ... cause phenotypic sex differences” (Bhargava 2021 at 222.)

4. Although disorders of sexual development (DSDs) are sometimes confused with discussions of transgender individuals, the two are different phenomena. DSDs are disorders of physical development. Many DSDs are “associated with genetic mutations that are now well known to endocrinologists and geneticists.” (Bhargava 2021 at 225) By contrast, a sense of transgender identity is usually not associated with any physical disorder, and “a clear biological causative underpinning of gender identity remains to be demonstrated.” (Bhargava 2021 at 226.)

5. Further demonstrating the biological importance of sex, Gershoni and Pietrokovski (2017) detail the results of an evaluation of “18,670 out of 19,644 informative protein-coding genes in men versus women” and reported that “there are over 6500 protein-coding genes with significant S[ex]D[ifferential] E[xpression] in at least one tissue. Most of these genes have SDE in just one tissue, but about 650 have SDE in two or more tissues, 31 have SDE in more than five tissues, and 22 have SDE in nine or more tissues” (Gershoni 2017 at 2-3.) Some examples of tissues identified by these authors that have SDE genes include breast mammary tissue, skeletal muscle, skin, thyroid gland, pituitary gland, subcutaneous adipose, lung, and heart left ventricle. Based on these observations the authors state “As expected, Y-linked genes that are normally carried only by men show SDE in many tissues” (Gershoni 2017 at 3.) As stated by Heydari et al. (2022, at 1), “Y chromosome harbors male-specific genes, which either solely or in cooperation with their X-counterpart, and independent or in conjunction with sex hormones have a considerable impact on basic physiology and disease mechanisms in most or all tissues development.”

6. In a review of 56 articles on the topic of sex-based differences in skeletal muscle, Haizlip et al., (2015) state that “More than 3,000 genes have been

identified as being differentially expressed between male and female skeletal muscle.” (Haizlip 2015 at 30.) Furthermore, the authors state that “Overall, evidence to date suggests that skeletal muscle fiber-type composition is dependent on species, anatomical location/function, and sex” (Haizlip 2015 at 30.) The differences in genetic expression between males and females influence the skeletal muscle fiber composition (i.e. fast twitch and fast twitch sub-type and slow twitch), the skeletal muscle fiber size, the muscle contractile rate, and other aspects of muscle function that influence athletic performance. As the authors review the differences in skeletal muscle between males and females they conclude, “Additionally, all of the fibers measured in men have significantly larger cross-sectional areas (CSA) compared with women.” (Haizlip 2015 at 31.) The authors also explore the effects of thyroid hormone, estrogen, and testosterone on gene expression and skeletal muscle function in males and females. One major conclusion by the authors is that “The complexity of skeletal muscle and the role of sex adding to that complexity cannot be overlooked.” (Haizlip 2015 at 37.) The evaluation of SDE in protein coding genes helps illustrate that the differences between men and women are intrinsically part of the chromosomal and genetic makeup of humans which can influence many tissues that are inherent to the athletic competitive advantages of men compared to women.

II. Biological men, or adolescent boys, have large, well-documented performance advantages over women and adolescent girls in almost all athletic contests.

7. It should scarcely be necessary to invoke scientific experts to “prove” that men are on average larger, stronger, and faster than women. All of us, along with our siblings and our peers and perhaps our children, have passed through puberty, and we have watched that differentiation between the sexes occur. This is common human experience and knowledge.

8. Nevertheless, these differences have been extensively studied and measured. I cited many of these studies in the first paper on this topic that I prepared, which was submitted in litigation in January 2020. Since then, in light of current controversies, several authors have compiled valuable collections or reviews of data extensively documenting this objective fact about the human species, as manifest in almost all sports, each of which I have reviewed and found informative. These include Coleman (2020), Hilton & Lundberg (2021), World Rugby (2020), Harper (2021), Hamilton (2021), and a “Briefing Book” prepared by the Women’s Sports Policy Working Group (2021). The important paper by Handelsman et al. (2018) also gathers scientific evidence of the systematic and large male athletic advantage.

9. These papers and many others document that men, adolescent boys, and prepubertal male children, substantially outperform comparably aged women,

adolescent girls and prepubertal female children, in competitions involving running speed, swimming speed, cycling speed, jumping height, jumping distance, and strength (to name a few, but not all, of the performance differences). As I discuss later, it is now clear that these performance advantages for men, adolescent boys, and prepubertal male children, are inherent to the biological differences between the sexes.

10. In fact, I am not aware of any scientific evidence today that disproves that after puberty men possess large advantages in athletic performance over women—so large that they are generally insurmountable for comparably gifted and trained athletes at every level (i.e. (a) elite, (b) collegiate, (c) scholastic, and (d) recreational competition). And I am not aware of any scientific evidence today that disproves that these measured performance advantages are at least largely the result of physiological differences between men and women which have been measured and are reasonably well understood.

11. My use of the term “advantage” in this paper must not be read to imply any normative judgment. The adult female physique is simply different from the adult male physique. Obviously, it is optimized in important respects for the difficult task of childbearing. On average, women require far fewer calories for healthy survival. Evolutionary biologists can and do theorize about the survival value or “advantages” provided by these and other distinctive characteristics of the female physique, but I will leave that to the evolutionary biologists. I use “advantage” to refer merely to performance advantages in athletic competitions.

12. I find in the literature a widespread consensus that the large performance and physiological advantages possessed by males—rather than social considerations or considerations of identity—are precisely the *reason* that most athletic competitions are separated by sex, with women treated as a “protected class.” To cite only a few statements accepting this as the justification:

- Handelsman et al. (2018) wrote, “Virtually all elite sports are segregated into male and female competitions. The main justification is to allow women a chance to win, as women have major disadvantages against men who are, on average, taller, stronger, and faster and have greater endurance due to their larger, stronger, muscles and bones as well as a higher circulating hemoglobin level.” (803)
- Millard-Stafford et al. (2018) wrote “Current evidence suggests that women will not swim or run as fast as men in Olympic events, which speaks against eliminating sex segregation in these individual sports” (530) “Given the historical context (2% narrowing in swimming over 44 y), a reasonable assumption might be that no more than 2% of the

current performance gap could still potentially be attributed to sociocultural influences.”, (533) and “Performance gaps between US men and women stabilized within less than a decade after federal legislation provided equal opportunities for female participation, but only modestly closed the overall gap in Olympic swimming by 2% (5% in running).” (533) Dr. Millard-Stafford, a full professor at Georgia Tech, holds a Ph.D. in Exercise Physiology and is a past President of the American College of Sports Medicine.

- In 2021, Hilton et al. wrote, “most sports have a female category the purpose of which is the protection of both fairness and, in some sports, safety/welfare of athletes who do not benefit from the physiological changes induced by male levels of testosterone from puberty onwards.” (204)
- In 2020 the Swiss High Court (“Tribunal Fédéral”) observed that “in most sports . . . women and men compete in two separate categories, because the latter possess natural advantages in terms of physiology.”¹
- The members of the Women’s Sports Policy Working Group wrote that “If sports were not sex-segregated, female athletes would rarely be seen in finals or on victory podiums,” and that “We have separate sex sport and eligibility criteria based on biological sex because this is the only way we can assure that female athletes have the same opportunities as male athletes not only to participate but to win in competitive sport. . . . If we did not separate athletes on the basis of biological sex—if we used any other physical criteria—we would never see females in finals or on podiums.” (WSPWG Briefing Book 2021 at 5, 20.)
- In 2020, the World Rugby organization stated that “the women's category exists to ensure protection, safety and equality for those who do not benefit from the biological advantage created by these biological performance attributes.” (World Rugby Transgender Women Guidelines 2020.)
- In 2021 Harper et al. stated “...the small decrease in strength in transwomen after 12–36 months of GAHT [Gender Affirming Hormone Therapy] suggests that transwomen likely retain a strength advantage

¹ “dans la plupart des sports . . . les femmes et les hommes concourent dans deux catégories séparées, ces derniers étant naturellement avantagés du point de vue physique.” Tribunal Fédéral decision of August 25, 2020, Case 4A_248/2019, 4A_398/2019, at §9.8.3.3.

over cisgender women.” (7) and “...observations in trained transgender individuals are consistent with the findings of the current review in untrained transgender individuals, whereby 30 months of GAHT may be sufficient to attenuate some, but not all, influencing factors associated with muscular endurance and performance.” (8)

- Hamilton et al. (2021), in a consensus statement for the International Federation of Sports Medicine (FIMS) concluded that “Transwomen have the right to compete in sports. However, cisgender women have the right to compete in a protected category.” (1409)

13. While the sources I mention above gather more extensive scientific evidence of this uncontroversial truth, I provide here a brief summary of representative facts concerning the male advantage in athletic performance.

A. Men are stronger.

14. Males exhibit greater strength throughout the body. Both Handelsman et al. (2018) and Hilton & Lundberg (2021) have gathered multiple literature references that document this fact in various muscle groups.

15. Men have in the neighborhood of 60%-100% greater **arm strength** than women. (Handelsman 2018 at 812.)² One study of elbow flexion strength (basically, bringing the fist up towards the shoulder) in a large sample of men and women found that men exhibited 109% greater isometric strength, and 89% higher strength in a single repetition. (Hilton 2021 at 204, summarizing Hubal (2005) at Table 2.)

16. **Grip strength** is often used as a useful proxy for strength more generally. In one study, men showed on average 57% greater grip strength than women. (Bohannon 2019.) A wider meta-analysis of multiple grip-strength studies not limited to athletic populations found that 18- and 19-year-old males exhibited in

² Handelsman expresses this as women having 50% to 60% of the “upper limb” strength of men. Handelsman cites Sale, *Neuromuscular function*, for this figure and the “lower limb” strength figure. Knox et al., *Transwomen in elite sport* (2018) are probably confusing the correct way to state percentages when they state that “differences lead to decreased trunk and lower body strength by 64% and 72% respectively, in women” (397): interpreted literally, this would imply that men have **almost 4x as much** lower body strength as do women.

the neighborhood of 2/3 greater grip strength than females. (Handelsman 2017 Figure 3, summarizing Silverman 2011 Table 1.)³

17. In an evaluation of maximal isometric handgrip strength in 1,654 healthy men, 533 healthy women aged 20-25 years and 60 “highly trained elite female athletes from sports known to require high hand-grip forces (judo, handball),” Leyk et al. (2007) observed that, “The results of female national elite athletes even indicate that the strength level attainable by extremely high training will rarely surpass the 50th percentile of untrained or not specifically trained men.” (Leyk 2007 at 415.)

18. Men have in the neighborhood of 25%-60% greater **leg strength** than women. (Handelsman 2018 at 812.) In another measure, men exhibit 54% greater knee extension torque and this male leg strength advantage is consistent across the lifespan. (Neder 1999 at 120-121.)

19. When male and female Olympic weightlifters of the same body weight are compared, the top males lift weights between 30% and 40% greater than the females of the same body weight. But when top male and female performances are compared in powerlifting, without imposing any artificial limitations on bodyweight, the male record is 65% higher than the female record. (Hilton 2021 at 203.)

20. In another measure that combines many muscle groups as well as weight and speed, moderately trained males generated 162% greater punching power than females even though men do not possess this large an advantage in any single bio-mechanical variable. (Morris 2020.) This objective reality was subjectively summed up by women’s mixed-martial arts fighter Tamikka Brents, who suffered significant facial injuries when she fought against a biological male who identified as female and fought under the name of Fallon Fox. Describing the experience, Brents said:

“I’ve fought a lot of women and have never felt the strength that I felt in a fight as I did that night. I can’t answer whether it’s because she was born a man or not because I’m not a doctor. I can only say, I’ve never felt so overpowered ever in my life, and I am an abnormally strong female in my own right.”⁴

³ Citing Silverman, *The secular trend for grip strength in Canada and the United States*, J. Ports Sci. 29:599-606 (2011).

⁴ <http://whoatv.com/exclusive-fallon-foxs-latest-opponent-opens-up-to-whoatv/> (last accessed October 5, 2021).

B. Men run faster.

21. Many scholars have detailed the wide performance advantages enjoyed by men in running speed. One can come at this reality from a variety of angles.

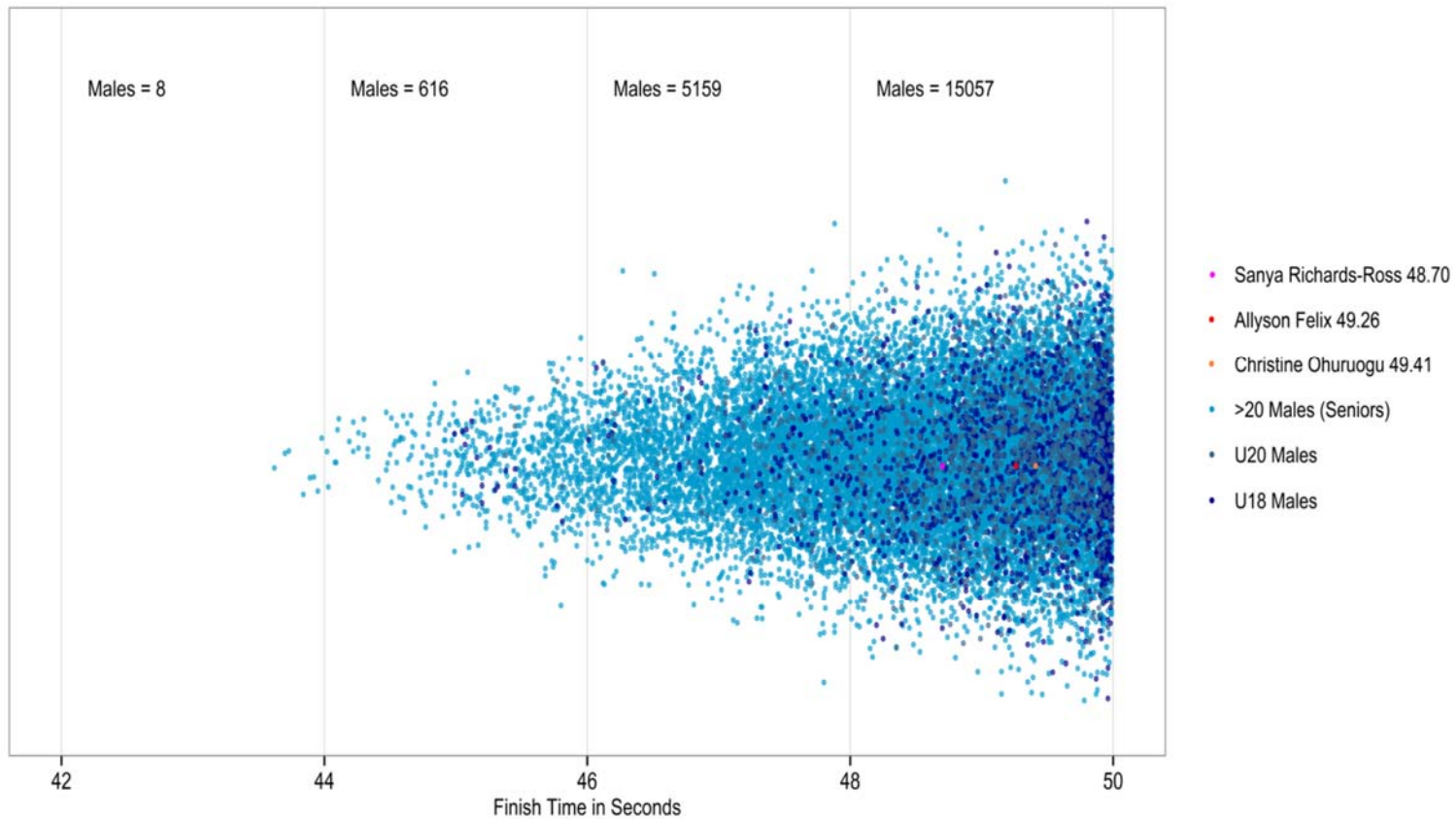
22. Multiple authors report a male speed advantage in the neighborhood of 10%-13% in a variety of events, with a variety of study populations. Handelsman et al. 2018 at 813 and Handelsman 2017 at 70 both report a male advantage of about 10% by age 17. Thibault et al. 2010 at 217 similarly reported a stable 10% performance advantage across multiple events at the Olympic level. Tønnessen et al. (2015 at 1-2) surveyed the data and found a consistent male advantage of 10%-12% in running events after the completion of puberty. They document this for both short sprints and longer distances. One group of authors found that the male advantage increased dramatically in ultra-long-distance competition (Lepers & Knechtle 2013.)

23. A great deal of current interest has been focused on track events. It is worth noting that a recent analysis of publicly available sports federation and tournament records found that men enjoy the *least* advantage in running events, as compared to a range of other events and metrics, including jumping, pole vaulting, tennis serve speed, golf drives, baseball pitching speed, and weightlifting. (Hilton 2021 at 201-202.) Nevertheless, as any serious runner will recognize, the approximately 10% male advantage in running is an overwhelming difference. Dr. Hilton calculates that “approximately 10,000 males have personal best times that are faster than the current Olympic 100m female champion.” (Hilton 2021 at 204.) Professors Doriane Coleman, Jeff Wald, Wickliffe Shreve, and Richard Clark dramatically illustrated this by compiling the data and creating the figure below (last accessed on February 10, 2022, at <https://bit.ly/35yOyS4>), which shows that the *lifetime best performances* of three female Olympic champions in the 400m event—including Team USA’s Sanya Richards-Ross and Allyson Felix—would not match the performances of “literally thousands of boys and men, including thousands who would be considered second tier in the men’s category” *just in 2017 alone*: (data were drawn from the International Association of Athletics Federations (IAAF) website which provides complete, worldwide results for individuals and events, including on an annual and an all-time basis).

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24. Professor Coleman and her colleague Wicklyffe Shreve also created the table below (last accessed on February 10, 2022, at <https://bit.ly/37E1s2X>), which “compares the number of men—males over 18—competing in events reported to the International Association of Athletics Federation whose results in each event in 2017 would have ranked them above the very best elite woman that year.”

Event	Best Women’s Result	Best Men’s Result	# of Men Outperforming
100 Meters	10.71	9.69	2,474
200 Meters	21.77	19.77	2,920
400 Meters	49.46	43.62	4,341
800 Meters	1:55.16*	1:43.10	3,992+
1500 Meters	3:56.14	3:28.80	3,216+
3000 Meters	8:23.14	7:28.73	1307+
5000 Meters	14:18.37	12:55.23	1,243
High Jump	2.06 meters	2.40 meters	777
Pole Vault	4.91 meters	6.00 meters	684
Long Jump	7.13 meters	8.65 meters	1,652
Triple Jump	14.96 meters	18.11 meters	969

25. The male advantage becomes insuperable well before the developmental changes of puberty are complete. Dr. Hilton documents that even “schoolboys”—defined as age 15 and under—have beaten the female world records in running, jumping, and throwing events. (Hilton 2021 at 204.)

26. Similarly, Coleman and Shreve created the table below (last accessed on February 10, 2022, at <https://bit.ly/37E1s2X>), which “compares the number of boys—males under the age of 18—whose results in each event in 2017 would rank them above the single very best elite [adult] woman that year:” data were drawn from the International Association of Athletics Federations (IAAF) website

Event	Best Women’s Result	Best Boys’ Result	# of Boys Outperforming
100 Meters	10.71	10.15	124 ⁺
200 Meters	21.77	20.51	182
400 Meters	49.46	45.38	285
800 Meters	1:55.16*	1:46.3	201+
1500 Meters	3:56.14	3:37.43	101+
3000 Meters	8:23.14	7:38.90	30
5000 Meters	14:18.37	12:55.58	15
High Jump	2.06 meters	2.25 meters	28
Pole Vault	4.91 meters	5.31 meters	10
Long Jump	7.13 meters	7.88 meters	74
Triple Jump	14.96 meters	17.30 meters	47

27. In an analysis I have performed of running events (consisting of the 100 m, 200 m, 400 m, 800 m, 1500 m, 5000 m, and 10000 m) in the Division 1, Division 2, and Division 3 NCAA Outdoor track championships for the years of 2010-2019, the average performance across all events of the 1st place man was 14.1% faster than the 1st place woman, with the smallest difference being a 10.2% advantage for men in the Division 1 100 m race. The average 8th place man across all events (the last place to earn the title of All American) was 11.2% faster than 1st place woman, with the smallest difference being a 6.5% advantage for men in the Division 1 100 m race. (Brown et al. Unpublished observations, to be presented at the 2022 Annual Meeting of the American College of Sports Medicine.)

28. Athletic.net® is an internet-based resource providing “results, team, and event management tools to help coaches and athletes thrive.” Among the resources available on Athletic.net are event records that can be searched by nationally or by state age group, school grade, and state. Higerd (2021) in an evaluation of high school track running performance records from five states (CA, FL, MN, NY, WA), over three years (2017 – 2019) observed that males were 14.38% faster than females in the 100M (at 99), 16.17% faster in the 200M (at 100), 17.62% faster in the 400M (at 102), 17.96% faster in the 800M (at 103), 17.81% faster in the 1600M (at 105), and 16.83% faster in the 3200M (at 106).

C. Men jump higher and farther.

29. Jumping involves both leg strength and speed as positive factors, with body weight of course a factor working against jump height. Despite their substantially greater body weight, males enjoy an even greater advantage in jumping than in running. Handelsman 2018 at 813, looking at youth and young adults, and Thibault 2010 at 217, looking at Olympic performances, both found male advantages in the range of 15%-20%. See also Tønnessen 2015 (approximately 19%); Handelsman 2017 (19%); Hilton 2021 at 201 (18%). Looking at the vertical jump called for in volleyball, research on elite volleyball players found that males jumped on average 50% higher during an “attack” at the net than did females. (Sattler 2015; see also Hilton 2021 at 203 (33% higher vertical jump).)

30. Higerd (2021) in an evaluation of high school high jump performance available through the track and field database athletic.net®, which included five states (CA, FL, MN, NY, WA), over three years (2017 – 2019) (at 82) observed that in 23,390 females and 26,843 males, females jumped an average of 1.35 m and males jumped an average of 1.62 m, for an 18.18% performance advantage for males (at 96). In an evaluation of long jump performance in 45,705 high school females and 54,506 high school males the females jumped an average of 4.08 m and males jumped an average of 5.20 m, for a 24.14% performance advantage for males (at 97).

31. The combined male advantage of body height and jump height means, for example, that a total of seven women in the WNBA have ever dunked a basketball in the regulation 10 foot hoop,⁵ while the ability to dunk appears to be almost universal among NBA players: “Since the 1996–97 season (the earliest data is available from Basketball-Reference.com), 1,801 different [NBA] players have combined for 210,842 regular-season dunks, and 1,259 out of 1,367 players (or 92%) who have played at least 1,000 minutes have dunked at least once.”⁶

D. Men throw, hit, and kick faster and farther.

32. Strength, arm-length, and speed combine to give men a large advantage over women in throwing. This has been measured in a number of studies.

33. One study of elite male and female baseball pitchers showed that men throw baseballs 35% faster than women—81 miles/hour for men vs. 60 miles/hour for women. (Chu 2009.) By age 12, “boys’ throwing velocity is already between 3.5 and 4 standard deviation units higher than the girls’.” (Thomas 1985 at 276.) By age seventeen, the *average* male can throw a ball farther than 99% of seventeen-year-old females. (Lombardo 2018; Chu 2009; Thomas 1985 at 268.) Looking at publicly available data, Hilton & Lundberg found that in both baseball pitching and the field hockey “drag flick,” the *record* ball speeds achieved by males are more than 50% higher than those achieved by females. (Hilton 2021 at 202-203.)

34. Men achieve serve speeds in tennis more that 15% faster than women; and likewise in golf achieve ball speeds off the tee more than 15% faster than women. (Hilton 2021 at 202.)

35. Males are able to throw a javelin more than 30% farther than females. (Lombardo 2018 Table 2; Hilton 2021 at 203.)

36. Men serve and spike volleyballs with higher velocity than women, with a performance advantage in the range of 29-34%. (Hilton 2021 at 204 Fig. 1.)

37. Men are also able to kick balls harder and faster. A study comparing collegiate soccer players found that males kick the ball with an average 20% greater velocity than females. (Sakamoto 2014.)

⁵ https://www.espn.com/wnba/story/_/id/32258450/2021-wnba-playoffs-brittney-griner-owns-wnba-dunking-record-coming-more.

⁶ <https://www.si.com/nba/2021/02/22/nba-non-dunkers-patty-mills-tj-mccconnell-steve-novak-daily-cover>

E. Males exhibit faster reaction times.

38. Interestingly, men enjoy an additional advantage over women in reaction time—an attribute not obviously related to strength or metabolism (e.g. VO_2max). “Reaction time in sports is crucial in both simple situations such as the gun shot in sprinting and complex situations when a choice is required. In many team sports this is the foundation for tactical advantages which may eventually determine the outcome of a game.” (Dogan 2009 at 92.) “Reaction times can be an important determinant of success in the 100m sprint, where medals are often decided by hundredths or even thousandths of a second.” (Tønnessen 2013 at 885.)

39. The existence of a sex-linked difference in reaction times is consistent over a wide range of ages and athletic abilities. (Dykiert 2012.) Even by the age of 4 or 5, in a ruler-drop test, males have been shown to exhibit 4% to 6% faster reaction times than females. (Latorre-Roman 2018.) In high school athletes taking a common baseline “ImPACT” test, males showed 3% faster reaction times than females. (Mormile 2018.) Researchers have found a 6% male advantage in reaction times of both first-year medical students (Jain 2015) and world-class sprinters (Tønnessen 2013).

40. Most studies of reaction times use computerized tests which ask participants to hit a button on a keyboard or to say something in response to a stimulus. One study on NCAA athletes measured “reaction time” by a criterion perhaps more closely related to athletic performance—that is, how fast athletes covered 3.3 meters after a starting signal. Males covered the 3.3 meters 10% faster than females in response to a visual stimulus, and 16% faster than females in response to an auditory stimulus. (Spierer 2010.)

41. Researchers have speculated that sex-linked differences in brain structure, as well as estrogen receptors in the brain, may be the source of the observed male advantage in reaction times, but at present this remains a matter of speculation and hypothesis. (Mormile at 19; Spierer at 962.)

III. Men have large measured physiological differences compared to women which demonstrably or likely explain their performance advantages.

42. No single physiological characteristic alone accounts for all or any one of the measured advantages that men enjoy in athletic performance. However, scientists have identified and measured a number of physiological factors that contribute to superior male performance.

A. Men are taller and heavier than women

43. In some sports, such as basketball and volleyball, height itself provides competitive advantage. While some women are taller than some men, based on data from 20 countries in North America, Europe, East Asia, and Australia, the 50th percentile for body height for women is 164.7 cm (5 ft 5 inches) and the 50th percentile for body height for men is 178.4 cm (5 ft 10 inches). Helping to illustrate the inherent height difference between men and women, from the same data analysis, the 95th percentile for body height for women is 178.9 cm (5 feet 10.43 inches), which is only 0.5 cm taller than the 50th percentile for men (178.4 cm; 5 feet 10.24 inches), while the 95th percentile for body height for men is 193.6 cm (6 feet 4.22 inches). (Roser 2013.)

44. To look at a specific athletic population, an evaluation of NCAA Division 1 basketball players compared 68 male guards and 59 male forwards to 105 female guards and 91 female forwards, and found that on average the male guards were 187.4 ± 7.0 cm tall and weighed 85.2 ± 7.4 kg while the female guards were 171.6 ± 5.0 cm tall and weighed 68.0 ± 7.4 kg. The male forwards were 201.7 ± 4.0 cm tall and weighed 105.3 ± 5.9 kg while the female forwards were 183.5 ± 4.4 cm tall and weighed 82.2 ± 12.5 kg. (Fields 2018 at 3.)

B. Males have larger and longer bones, stronger bones, and different bone configuration.

45. Obviously, males on average have longer bones. “Sex differences in height have been the most thoroughly investigated measure of bone size, as adult height is a stable, easily quantified measure in large population samples. Extensive twin studies show that adult height is highly heritable with predominantly additive genetic effects that diverge in a sex-specific manner from the age of puberty onwards.” (Handelsman 2018 at 818.) “Pubertal testosterone exposure leads to an ultimate average greater height in men of 12–15 centimeters, larger bones, greater muscle mass, increased strength and higher hemoglobin levels.” (Gooren 2011 at 653.)

46. “Men have distinctively greater bone size, strength, and density than do women of the same age. As with muscle, sex differences in bone are absent prior to puberty but then accrue progressively from the onset of male puberty due to the sex difference in exposure to adult male circulating testosterone concentrations.” (Handelsman 2018 at 818.)

47. “[O]n average men are 7% to 8% taller with longer, denser, and stronger bones, whereas women have shorter humerus and femur cross-sectional

areas being 65% to 75% and 85%, respectively, those of men.” (Handelsman 2018 at 818.)

48. Greater height, leg, and arm length themselves provide obvious advantages in several sports. But male bone geometry also provides less obvious advantages. “The major effects of men’s larger and stronger bones would be manifest via their taller stature as well as the larger fulcrum with greater leverage for muscular limb power exerted in jumping, throwing, or other explosive power activities.” (Handelsman 2018 at 818.)

49. Male advantage in bone size is not limited to length, as larger bones provide the mechanical framework for larger muscle mass. “From puberty onwards, men have, on average, 10% more bone providing more surface area. The larger surface area of bone accommodates more skeletal muscle so, for example, men have broader shoulders allowing more muscle to build. This translates into 44% less upper body strength for women, providing men an advantage for sports like boxing, weightlifting and skiing. In similar fashion, muscle mass differences lead to decreased trunk and lower body strength by 64% and 72%, respectively in women. These differences in body strength can have a significant impact on athletic performance, and largely underwrite the significant differences in world record times and distances set by men and women.” (Knox 2019 at 397.)

50. Meanwhile, distinctive aspects of the female pelvis geometry cut against athletic performance. “[T]he widening of the female pelvis during puberty, balancing the evolutionary demands of obstetrics and locomotion, retards the improvement in female physical performance.” (Handelsman 2018 at 818.) “[T]he major female hormones, oestrogens, can have effects that disadvantage female athletic performance. For example, women have a wider pelvis changing the hip structure significantly between the sexes. Pelvis shape is established during puberty and is driven by oestrogen. The different angles resulting from the female pelvis leads to decreased joint rotation and muscle recruitment ultimately making them slower.” (Knox 2019 at 397.)

51. There are even sex-based differences in foot size and shape. Wunderlich & Cavanaugh (2001) observed that a “foot length of 257 mm represents a value that is ... approximately the 20th percentile men’s foot lengths and the 80th percentile women’s foot lengths.” (607) and “For a man and a woman, both with statures of 170 cm (5 feet 7 inches), the man would have a foot that was approximately 5 mm longer and 2 mm wider than the woman.” (608). Based on these, and other analyses, they conclude that “female feet and legs are not simply scaled-down versions of male feet but rather differ in a number of shape characteristics, particularly at the arch, the lateral side of the foot, the first toe, and the ball of the foot.” (605) Further, Fessler et al. (2005) observed that “female foot length is consistently smaller than male foot length” (44) and concludes that

“proportionate foot length is smaller in women” (51) with an overall conclusion that “Our analyses of genetically disparate populations reveal a clear pattern of sexual dimorphism, with women consistently having smaller feet proportionate to stature than men.” (53)

52. Beyond simple performance, the greater density and strength of male bones provide higher protection against stresses associated with extreme physical effort: “[S]tress fractures in athletes, mostly involving the legs, are more frequent in females, with the male protection attributable to their larger and thicker bones.” (Handelsman 2018 at 818.)

C. Males have much larger muscle mass.

53. The fact that, on average, men have substantially larger muscles than women is as well known to common observation as men’s greater height. But the male advantage in muscle size has also been extensively measured. The differential is large.

54. “On average, women have 50% to 60% of men’s upper arm muscle cross-sectional area and 65% to 70% of men’s thigh muscle cross-sectional area, and women have 50% to 60% of men’s upper limb strength and 60% to 80% of men’s leg strength. Young men have on average a skeletal muscle mass of >12 kg greater than age-matched women at any given body weight.” (Handelsman 2018 at 812. See also Gooren 2011 at 653, Thibault 2010 at 214.)

55. “There is convincing evidence that the sex differences in muscle mass and strength are sufficient to account for the increased strength and aerobic performance of men compared with women and is in keeping with the differences in world records between the sexes.” (Handelsman 2018 at 816.)

56. Once again, looking at specific and comparable populations of athletes, an evaluation of NCAA Division 1 basketball players consisting of 68 male guards and 59 male forwards, compared to 105 female guards and 91 female forwards, reported that on average the male guards had 77.7 ± 6.4 kg of fat free mass and 7.4 ± 3.1 kg fat mass while the female guards had 54.6 ± 4.4 kg fat free mass and 13.4 ± 5.4 kg fat mass. The male forwards had 89.5 ± 5.9 kg fat free mass and 15.9 ± 5.6 kg fat mass while the female forwards had 61.8 ± 5.9 kg fat free mass and 20.5 ± 7.7 kg fat mass. (Fields 2018 at 3.)

D. Females have a larger proportion of body fat.

57. While women have smaller muscles, they have proportionately more body fat, in general a negative for athletic performance. “Oestrogens also affect body

composition by influencing fat deposition. Women, on average, have higher percentage body fat, and this holds true even for highly trained healthy athletes (men 5%–10%, women 8%–15%). Fat is needed in women for normal reproduction and fertility, but it is not performance-enhancing. This means men with higher muscle mass and less body fat will normally be stronger kilogram for kilogram than women.” (Knox 2019 at 397.)

58. “[E]lite females have more (<13 vs. <5 %) body fat than males. Indeed, much of the difference in [maximal oxygen uptake] between males and females disappears when it is expressed relative to lean body mass. . . . Males possess on average 7–9 % less percent body fat than females.” (Lepers 2013 at 853.)

59. Knox et al. observe that both female pelvis shape and female body fat levels “disadvantage female athletes in sports in which speed, strength and recovery are important,” (Knox 2019 at 397), while Tønnessen et al. describe the “ratio between muscular power and total body mass” as “critical” for athletic performance. (Tønnessen 2015 at 7.)

E. Males are able to metabolize and release energy to muscles at a higher rate due to larger heart and lung size, and higher hemoglobin concentrations.

60. While advantages in bone size, muscle size, and body fat are easily perceived and understood by laymen, scientists also measure and explain the male athletic advantage at a more abstract level through measurements of metabolism, or the ability to deliver energy to muscles throughout the body.

61. Energy release at the muscles depends centrally on the body’s ability to deliver oxygen to the muscles, where it is essential to the complex chain of biochemical reactions that make energy available to power muscle fibers. Men have multiple distinctive physiological attributes that together give them a large advantage in oxygen delivery.

62. Oxygen is taken into the blood in the lungs. Men have greater capability to take in oxygen for multiple reasons. “[L]ung capacity [is] larger in men because of a lower diaphragm placement due to Y-chromosome genetic determinants.” (Knox 2019 at 397.) Supporting larger lung capacity, men have “greater cross-sectional area of the trachea”; that is, they can simply move more air in and out of their lungs in a given time. (Hilton 2021 at 201.)

63. More, male lungs provide superior oxygen exchange even for a given volume: “The greater lung volume is complemented by testosterone-driven **enhanced alveolar multiplication** rate during the early years of life. Oxygen exchange takes place between the air we breathe and the bloodstream at the alveoli,

so more alveoli allows more oxygen to pass into the bloodstream. Therefore, the greater lung capacity allows more air to be inhaled with each breath. This is coupled with an improved uptake system allowing men to absorb more oxygen.” (Knox 2019 at 397.)

64. “Once in the blood, oxygen is carried by haemoglobin. **Haemoglobin concentrations** are directly modulated by testosterone so men have higher levels and can carry more oxygen than women.” (Knox 2019 at 397.) “It is well known that levels of circulating hemoglobin are androgen-dependent and consequently higher in men than in women by 12% on average.... Increasing the amount of hemoglobin in the blood has the biological effect of increasing oxygen transport from lungs to tissues, where the increased availability of oxygen enhances aerobic energy expenditure.” (Handelsman 2018 at 816.) (See also Lepers 2013 at 853; Handelsman 2017 at 71.) “It may be estimated that as a result the average maximal oxygen transfer will be ~10% greater in men than in women, which has a direct impact on their respective athletic capacities.” (Handelsman 2018 at 816.)

65. But the male metabolic advantage is further multiplied by the fact that men are also able to **circulate more blood per second** than are women. “Oxygenated blood is pumped to the active skeletal muscle by the heart. The left ventricle chamber of the heart is the reservoir from which blood is pumped to the body. The larger the left ventricle, the more blood it can hold, and therefore, the more blood can be pumped to the body with each heartbeat, a physiological parameter called ‘stroke volume’. The female heart size is, on average, 85% that of a male resulting in the stroke volume of women being around 33% less.” (Knox 2018 at 397.) Hilton cites different studies that make the same finding, reporting that men on average can pump 30% more blood through their circulatory system per minute (“cardiac output”) than can women. (Hilton 2021 at 202.)

66. Finally, at the cell where the energy release is needed, men appear to have yet another advantage. “Additionally, there is experimental evidence that testosterone increases . . . **mitochondrial biogenesis**, myoglobin expression, and IGF-1 content, which may augment energetic and power generation of skeletal muscular activity.” (Handelsman 2018 at 811.)

67. “Putting all of this together, men have a much more efficient cardiovascular and respiratory system.” (Knox 2019 at 397.) A widely accepted measurement that reflects the combined effects of all these respiratory, cardiovascular, and metabolic advantages is referred to as “ $\dot{V}O_2\text{max}$,” which refers to the maximum rate at which an individual can consume oxygen during aerobic

exercise.⁷ Looking at 11 separate studies, including both trained and untrained individuals, Pate et al. concluded that men have a 50% higher VO_2max than women on average, and a 25% higher VO_2max in relation to body weight. (Pate 1984 at 92. See also Hilton 2021 at 202.)

IV. The role of testosterone in the development of male advantages in athletic performance.

68. The following tables of reference ranges for circulating testosterone in males and females are presented to help provide context for some of the subsequent information regarding athletic performance and physical fitness in children, youth, and adults, and regarding testosterone suppression in transwomen and athletic regulations. These data were obtained from the Mayo Clinic Laboratories (available at <https://www.mayocliniclabs.com/test-catalog/overview/83686#Clinical-and-Interpretive>, accessed January 14, 2022).

Reference ranges for serum testosterone concentrations in males and females.

Age	Males	Females
0 – 5 months	2.6 – 13.9 nmol/l	0.7 – 2.8 nmol/l
6 months – 9 years	0.2 – 0.7 nmol/l	0.2 – 0.7 nmol/l
10 – 11 years	0.2 – 4.5 nmol/l	0.2 – 1.5 nmol/l
12 -13 years	0.2 – 27.7 nmol/l	0.2 – 2.6 nmol/l
14 years	0.2 – 41.6 nmol/l	0.2 – 2.6 nmol/l
15 – 16 years	3.5 – 41.6 nmol/l	0.2 – 2.6 nmol/l
17 – 18 years	10.4 – 41.6 nmol/l	0.7 – 2.6 nmol/l
19 years and older	8.3 – 32.9 nmol/l	0.3 – 2.1 nmol/l

Please note that testosterone concentrations are sometimes expressed in units of ng/dl, and 1 nmol/l = 28.85 ng/dl.

69. Tanner Stages can be used to help evaluate the onset and progression of puberty and may be more helpful in evaluating normal testosterone concentrations than age in adolescents. “Puberty onset (transition from Tanner stage I to Tanner stage II) occurs for boys at a median age of 11.5 years and for girls

⁷ VO_2max is “based on hemoglobin concentration, total blood volume, maximal stroke volume, cardiac size/mass/compliance, skeletal muscle blood flow, capillary density, and mitochondrial content.” International Statement, *The Role of Testosterone in Athletic Performance* (January 2019), available at https://law.duke.edu/sites/default/files/centers/sportslaw/Experts_T_Statement_2019.pdf.

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at a median age of 10.5 years. . . . Progression through Tanner stages is variable. Tanner stage V (young adult) should be reached by age 18.”

(<https://www.mayocliniclabs.com/test-catalog/overview/83686#Clinical-and-Interpretive>, accessed January 14, 2022).

Reference Ranges for serum testosterone concentrations by Tanner stage

Tanner Stage	Males	Females
I (prepubertal)	0.2 – 0.7 nmol/l	0.7 – 0.7 nmol/l
II	0.3 – 2.3 nmol/l	0.2 – 1.6 nmol/l
III	0.9 – 27.7 nmol/l	0.6 – 2.6 nmol/l
IV	2.9 – 41.6 nmol/l	0.7 – 2.6 nmol/l
V (young adult)	10.4 – 32.9 nmol/l	0.4 – 2.1 nmol/l

70. Senefeld et al. (2020 at 99) state that “Data on testosterone levels in children and adolescents segregated by sex are scarce and based on convenience samples or assays with limited sensitivity and accuracy.” They therefore “analyzed the timing of the onset and magnitude of the divergence in testosterone in youths aged 6 to 20 years by sex using a highly accurate assay” (isotope dilution liquid chromatography tandem mass spectrometry). Senefeld observed a significant difference beginning at age 11, which is to say about fifth grade.

Serum testosterone concentrations (nmol/L) in youths aged 6 to 20 years measured using isotope dilution liquid chromatography tandem mass spectrometry (Senefeld et al. ,2020, at 99)

Age (y)	Boys			Girls		
	5th	50th	95th	5th	50th	95th
6	0.0	0.1	0.2	0.0	0.1	0.2
7	0.0	0.1	0.2	0.0	0.1	0.3
8	0.0	0.1	0.3	0.0	0.1	0.3
9	0.0	0.1	0.3	0.1	0.2	0.6
10	0.1	0.2	2.6	0.1	0.3	0.9
11	0.1	0.5	11.3	0.2	0.5	1.3
12	0.3	3.6	17.2	0.2	0.7	1.4
13	0.6	9.2	21.5	0.3	0.8	1.5
14	2.2	11.9	24.2	0.3	0.8	1.6
15	4.9	13.2	25.8	0.4	0.8	1.8
16	5.2	14.9	24.1	0.4	0.9	2.0
17	7.6	15.4	27.0	0.5	1.0	2.0
18	9.2	16.3	25.5	0.4	0.9	2.1
19	8.1	17.2	27.9	0.4	0.9	2.3
20	6.5	17.9	29.9	0.4	1.0	3.4

A. Boys exhibit advantages in athletic performance even before puberty.

71. It is often said or assumed that boys enjoy no significant athletic advantage over girls before puberty. However, this is not true. Writing in their seminal work on the physiology of elite young female athletes, McManus and Armstrong (2011) reviewed the differences between boys and girls regarding bone density, body composition, cardiovascular function, metabolic function, and other physiologic factors that can influence athletic performance. They stated, “At birth, boys tend to have a greater lean mass than girls. This difference remains small but detectable throughout childhood with about a 10% greater lean mass in boys than girls prior to puberty.” (28) “Sexual dimorphism underlies much of the physiologic response to exercise,” and most importantly these authors concluded that, “Young girl athletes are not simply smaller, less muscular boys.” (23)

72. Certainly, boys’ physiological and performance advantages increase rapidly from the beginning of puberty until around age 17-19. But much data and multiple studies show that significant physiological differences, and significant male athletic performance advantages in certain areas, exist before significant developmental changes associated with male puberty have occurred.

73. Starting at birth, girls have more body fat and less fat-free mass than boys. Davis et al. (2019) in an evaluation of 602 infants reported that at birth and age 5 months, infant boys have larger total body mass, body length, and fat-free mass while having lower percent body fat than infant girls. In an evaluation of 20 boys and 20 girls ages 3-8 years old, matched for age, height, and body weight Taylor et al. (Taylor 1997) reported that the “boys had significantly less fat, a lower % body fat and a higher bone-free lean tissue mass than the girls” when “expressed as a percentage of the average fat mass of the boys”, the girls’ fat mass was 52% higher than the boys “...while the bone-free lean tissue mass was 9% lower” (at 1083.) In an evaluation of 376 prepubertal [Tanner Stage 1] boys and girls, Taylor et al. (2010) observed that the boys had 21.6% more lean mass, and 13% less body fat (when expressed as percent of total body mass) than did the girls. In a review of 22 peer reviewed publications on the topic, Staiano and Katzmarzyk (2012) conclude that “... girls have more T[otal]B[ody]F[at] than boys throughout childhood and adolescence. (at 4.)

74. In the seminal textbook, *Growth, Maturation, and Physical Activity*, Malina et al. (2004) present a summary of data from Gauthier et al. (1983) which present data from “a national sample of Canadian children and youth” demonstrating that from ages 7 to 17, boys have a higher aerobic power output than do girls of the same ages when exercise intensity is measured using heart rate

(Malina at 242.) That is to say, that at a heart rate of 130 beats per minute, or 150, or 170, a 7 to 17 year old boy should be able to run, bike, or swim faster than a similarly aged girl.

75. Considerable data from school-based fitness testing exists showing that prepubertal boys outperform comparably aged girls in tests of muscular strength, muscular endurance, and running speed. These sex-based differences in physical fitness are relevant to the current issue of sex-based sports categories because, as stated by Lesinski et al. (2020), in an evaluation “of 703 male and female elite young athletes aged 8–18” (1) “fitness development precedes sports specialization” (2) and further observed that “males outperformed females in C[ounter]M[ovement]J[ump], D[rop]J[ump], C[hange]o[f]D[irection speed] performances and hand grip strength.” (5).

76. Tambalis et al. (2016) states that “based on a large data set comprising 424,328 test performances” (736) using standing long jump to measure lower body explosive power, sit and reach to measure flexibility, timed 30 second sit ups to measure abdominal and hip flexor muscle endurance, 10 x 5 meter shuttle run to evaluate speed and agility, and multi-stage 20 meter shuttle run test to estimate aerobic performance (738). “For each of the fitness tests, performance was better in boys compared with girls ($p < 0.001$), except for the S[it and] R[each] test ($p < 0.001$).” (739) In order to illustrate that the findings of Tambalis (2016) are not unique to children in Greece, the authors state “Our findings are in accordance with recent studies from Latvia [] Portugal [] and Australia [Catley & Tomkinson (2013)].”(744).

77. The 20-m multistage fitness test is a commonly used maximal running aerobic fitness test used in the Eurofit Physical Fitness Test Battery and the FitnessGram Physical Fitness test. It is also known as the 20-meter shuttle run test, PACER test, or beep test (among other names; this is not the same test as the shuttle run in the Presidential Fitness Test). This test involves continuous running between two lines 20 meters apart in time to recorded beeps. The participants stand behind one of the lines facing the second line and begin running when instructed by the recording. The speed at the start is quite slow. The subject continues running between the two lines, turning when signaled by the recorded beeps. After about one minute, a sound indicates an increase in speed, and the beeps will be closer together. This continues each minute (level). If the line is reached before the beep sounds, the subject must wait until the beep sounds before continuing. If the line is not reached before the beep sounds, the subject is given a warning and must continue to run to the line, then turn and try to catch up with the pace within two more 'beeps'. The subject is given a warning the first time they fail to reach the line (within 2 meters) and eliminated after the second warning.

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78. To illustrate the sex-based performance differences observed by Tambalis, I have prepared the following table showing the number of laps completed in the 20 m shuttle run for children ages 6-18 years for the low, middle, and top decile (Tambalis 2016 at 740 & 742), and have calculated the percent difference between the boys and girls using the same equation as Millard-Stafford (2018).

Performance difference between boys and girls ÷ Girls performance

Number of laps completed in the 20m shuttle run for children ages 6-18 years

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
6	4	14	31	4.0	12.0	26.0	0.0%	16.7%	19.2%
7	8	18	38	8.0	15.0	29.0	0.0%	20.0%	31.0%
8	9	23	47	9.0	18.0	34.0	0.0%	27.8%	38.2%
9	11	28	53	10.0	20.0	40.0	10.0%	40.0%	32.5%
10	12	31	58	11.0	23.0	43.0	9.1%	34.8%	34.9%
11	15	36	64	12.0	26.0	48.0	25.0%	38.5%	33.3%
12	15	39	69	12.0	26.0	49.0	25.0%	50.0%	40.8%
13	16	44	76	12.0	26.0	50.0	33.3%	69.2%	52.0%
14	19	50	85	12.0	26.0	50.0	58.3%	92.3%	70.0%
15	20	53	90	12.0	25.0	47.0	66.7%	112.0%	91.5%
16	20	54	90	11.0	24.0	45.0	81.8%	125.0%	100.0%
17	18	50	86	10.0	23.0	50.0	80.0%	117.4%	72.0%
18	13	48	87	8.0	23.0	39.5	62.5%	108.7%	120.3%

79. The Presidential Fitness Test was widely used in schools in the United States from the late 1950s until 2013 (when it was phased out in favor of the Presidential Youth Fitness Program and FitnessGram, both of which focus on health-related physical fitness and do not present data in percentiles). Students participating in the Presidential Fitness Test could receive “The National Physical Fitness Award” for performance equal to the 50th percentile in five areas of the fitness test, “while performance equal to the 85th percentile could receive the Presidential Physical Fitness Award.” Tables presenting the 50th and 85th percentiles for the Presidential Fitness Test for males and females ages 6 – 17, and differences in performance between males and females, for curl-ups, shuttle run, 1 mile run, push-ups, and pull-ups appear in the Appendix.

80. For both the 50th percentile (The National Physical Fitness Award) and the 85th percentile (Presidential Physical Fitness Award), with the exception of curl-ups in 6-year-old children, boys outperform girls. The difference in pull-ups for the 85th percentile for ages 7 through 17 are particularly informative with boys

outperforming girls by 100% – 1200%, highlighting the advantages in upper body strength in males.

81. A very recent literature review commissioned by the five United Kingdom governmental Sport Councils concluded that while “[i]t is often assumed that children have similar physical capacity regardless of their sex, . . . large-scale data reports on children from the age of six show that young males have significant advantage in cardiovascular endurance, muscular strength, muscular endurance, speed/agility and power tests,” although they “score lower on flexibility tests.” (UK Sports Councils’ Literature Review 2021 at 3.)

82. Hilton et al., also writing in 2021, reached the same conclusion: “An extensive review of fitness data from over 85,000 Australian children aged 9–17 years old showed that, compared with 9-year-old females, 9-year-old males were faster over short sprints (9.8%) and 1 mile (16.6%), could jump 9.5% further from a standing start (a test of explosive power), could complete 33% more push-ups in 30 [seconds] and had 13.8% stronger grip.” (Hilton 2021 at 201, summarizing the findings of Catley & Tomkinson 2013.)

83. The following data are taken from Catley & Tomkinson (2013 at 101) showing the low, middle, and top decile for 1.6 km run (1.0 mile) run time for 11,423 girls and boys ages 9-17.

1.6 km run (1.0 mile) run time for 11,423 girls and boys ages 9-17

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
9	684	522	423	769.0	609.0	499.0	11.1%	14.3%	15.2%
10	666	511	420	759.0	600.0	494.0	12.3%	14.8%	15.0%
11	646	500	416	741.0	586.0	483.0	12.8%	14.7%	13.9%
12	621	485	408	726.0	575.0	474.0	14.5%	15.7%	13.9%
13	587	465	395	716.0	569.0	469.0	18.0%	18.3%	15.8%
14	556	446	382	711.0	567.0	468.0	21.8%	21.3%	18.4%
15	531	432	373	710.0	570.0	469.0	25.2%	24.2%	20.5%
16	514	423	366	710.0	573.0	471.0	27.6%	26.2%	22.3%
17	500	417	362	708.0	575.0	471.0	29.4%	27.5%	23.1%

84. Tomkinson et al. (2018) performed a similarly extensive analysis of literally millions of measurements of a variety of strength and agility metrics from the “Eurofit” test battery on children from 30 European countries. They provide detailed results for each metric, broken out by decile. Sampling the low, middle, and top decile, 9-year-old boys performed better than 9-year-old girls by between 6.5%

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and 9.7% in the standing broad jump; from 11.4% to 16.1% better in handgrip; and from 45.5% to 49.7% better in the “bent-arm hang.” (Tomkinson 2018.)

85. The Bent Arm Hang test is a measure of upper body muscular strength and endurance used in the Eurofit Physical Fitness Test Battery. To perform the Bent Arm Hang, the child is assisted into position with the body lifted to a height so that the chin is level with the horizontal bar (like a pull up bar). The bar is grasped with the palms facing away from body and the hands shoulder width apart. The timing starts when the child is released. The child then attempts to hold this position for as long as possible. Timing stops when the child's chin falls below the level of the bar, or the head is tilted backward to enable the chin to stay level with the bar.

86. Using data from Tomkinson (2018; table 7 at 1452), the following table sampling the low, middle, and top decile for bent arm hang for 9- to 17-year-old children can be constructed:

Bent Arm Hang time (in seconds) for children ages 9 - 17 years

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
9	2.13	7.48	25.36	1.43	5.14	16.94	48.95%	45.53%	49.70%
10	2.25	7.92	26.62	1.42	5.15	17.06	58.45%	53.79%	56.04%
11	2.35	8.32	27.73	1.42	5.16	17.18	65.49%	61.24%	61.41%
12	2.48	8.79	28.99	1.41	5.17	17.22	75.89%	70.02%	68.35%
13	2.77	9.81	31.57	1.41	5.18	17.33	96.45%	89.38%	82.17%
14	3.67	12.70	38.39	1.40	5.23	17.83	162.14%	142.83%	115.31%
15	5.40	17.43	47.44	1.38	5.35	18.80	291.30%	225.79%	152.34%
16	7.39	21.75	53.13	1.38	5.63	20.57	435.51%	286.32%	158.29%
17	9.03	24.46	54.66	1.43	6.16	23.61	531.47%	297.08%	131.51%

87. Evaluating these data, a 9-year-old boy in the 50th percentile (that is to say a 9-year-old boy of average upper body muscular strength and endurance) will perform better in the bent arm hang test than 9 through 17-year-old girls in the 50th percentile. Similarly, a 9-year-old boy in the 90th percentile will perform better in the bent arm hang test than 9 through 17-year-old girls in the 90th percentile.

88. Using data from Tomkinson et al. (2017; table 1 at 1549), the following table sampling the low, middle, and top decile for running speed in the last stage of the 20 m shuttle run for 9- to 17-year-old children can be constructed.

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20 m shuttle Running speed (km/h at the last completed stage)

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
9	8.94	10.03	11.13	8.82	9.72	10.61	1.36%	3.19%	4.90%
10	8.95	10.13	11.31	8.76	9.75	10.74	2.17%	3.90%	5.31%
11	8.97	10.25	11.53	8.72	9.78	10.85	2.87%	4.81%	6.27%
12	9.05	10.47	11.89	8.69	9.83	10.95	4.14%	6.51%	8.58%
13	9.18	10.73	12.29	8.69	9.86	11.03	5.64%	8.82%	11.42%
14	9.32	10.96	12.61	8.70	9.89	11.07	7.13%	10.82%	13.91%
15	9.42	11.13	12.84	8.70	9.91	11.11	8.28%	12.31%	15.57%
16	9.51	11.27	13.03	8.71	9.93	11.14	9.18%	13.49%	16.97%
17	9.60	11.41	13.23	8.72	9.96	11.09	10.09%	14.56%	19.30%

89. Evaluating these data, a 9-year-old boy in the 50th percentile (that is to say a 9-year-old boy of average running speed) will run faster in the final stage of the 20 m shuttle run than 9 through 17-year-old girls in the 50th percentile. Similarly, a 9-year-old boy in the 90th percentile will run faster in the final stage of the 20-m shuttle run than 9 through 15, and 17-year-old girls in the 90th percentile and will be 0.01 km/h (0.01%) slower than 16-year-old girls in the 90th percentile.

90. Just using these two examples for bent arm hang and 20-m shuttle running speed (Tomkinson 2107, Tomkinson 2018) based on large sample sizes (thus having tremendous statistical power) it becomes apparent that a 9-year-old boy will be very likely to outperform similarly trained girls of his own age and older in athletic events involving upper body muscle strength and/or running speed.

91. Another report published in 2014 analyzed physical fitness measurements of 10,302 children aged 6 -10.9 years of age, from the European countries of Sweden, Germany, Hungary, Italy, Cyprus, Spain, Belgium, and Estonia. (De Miguel-Etayo et al. 2014.) The authors observed "... that boys performed better than girls in speed, lower- and upper-limb strength and cardiorespiratory fitness." (57) The data showed that for children of comparable fitness (i.e. 99th percentile boys vs. 99th percentile girls, 50th percentile boys vs. 50th percentile girls, etc.) the boys outperform the girls at every age in measurements of handgrip strength, standing long jump, 20-m shuttle run, and predicted VO₂max (pages 63 and 64, respectively). For clarification, VO₂max is the maximal oxygen consumption, which correlates to 30-40% of success in endurance sports.

92. The standing long jump, also called the Broad Jump, is a common and easy to administer test of explosive leg power used in the Eurofit Physical Fitness Test Battery and in the NFL Combine. In the standing long jump, the participant stands behind a line marked on the ground with feet slightly apart. A two-foot take-

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off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The participant attempts to jump as far as possible, landing on both feet without falling backwards. The measurement is taken from takeoff line to the nearest point of contact on the landing (back of the heels) with the best of three attempts being scored.

93. Using data from De Miguel-Etayo et al. (2014, table 3 at 61), which analyzed physical fitness measurements of 10,302 children aged 6 -10.9 years of age, from the European countries of Sweden, Germany, Hungary, Italy, Cyprus, Spain, Belgium, and Estonia, the following table sampling the low, middle, and top decile for standing long jump for 6- to 9-year-old children can be constructed:

Standing Broad Jump (cm) for children ages 6-9 years

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
6-<6.5	77.3	103.0	125.3	69.1	93.8	116.7	11.9%	9.8%	7.4%
6.5-<7	82.1	108.0	130.7	73.6	98.7	121.9	11.5%	9.4%	7.2%
7-<7.5	86.8	113.1	136.2	78.2	103.5	127.0	11.0%	9.3%	7.2%
7.5-<8	91.7	118.2	141.6	82.8	108.3	132.1	10.7%	9.1%	7.2%
8-<8.5	96.5	123.3	146.9	87.5	113.1	137.1	10.3%	9.0%	7.1%
8.5-<9	101.5	128.3	152.2	92.3	118.0	142.1	10.0%	8.7%	7.1%

94. Another study of Eurofit results for over 400,000 Greek children reported similar results. “[C]ompared with 6-year-old females, 6-year-old males completed 16.6% more shuttle runs in a given time and could jump 9.7% further from a standing position.” (Hilton 2021 at 201, summarizing findings of Tambalis et al. 2016.)

95. Silverman (2011) gathered hand grip data, broken out by age and sex, from a number of studies. Looking only at the nine direct comparisons within individual studies tabulated by Silverman for children aged 7 or younger, in eight of these the boys had strength advantages of between 13 and 28 percent, with the remaining outlier recording only a 4% advantage for 7-year-old boys. (Silverman 2011 Table 1.)

96. To help illustrate the importance of one specific measure of physical fitness in athletic performance, Pocek (2021) stated that to be successful, volleyball “players should distinguish themselves, besides in skill level, in terms of above-average body height, upper and lower muscular power, speed, and agility. Vertical jump is a fundamental part of the spike, block, and serve.” (8377) Pocek further stated that “relative vertical jumping ability is of great importance in volleyball regardless of the players’ position, while absolute vertical jump values can differentiate players not only in terms of player position and performance level but in their career trajectories.” (8382)

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97. Using data from Ramírez-Vélez (2017; table 2 at 994) which analyzed vertical jump measurements of 7,614 healthy Colombian schoolchildren aged 9 -17.9 years of age the following table sampling the low, middle, and top decile for vertical jump can be constructed:

Vertical Jump Height (cm) for children ages 9 - 17 years

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
9	18.0	24.0	29.5	16.0	22.3	29.0	12.5%	7.6%	1.7%
10	19.5	25.0	32.0	18.0	24.0	29.5	8.3%	4.2%	8.5%
11	21.0	27.0	32.5	19.5	25.0	31.0	7.7%	8.0%	4.8%
12	22.0	27.5	34.5	20.0	25.5	31.5	10.0%	7.8%	9.5%
13	23.0	30.5	39.0	19.0	25.5	32.0	21.1%	19.6%	21.9%
14	23.5	32.0	41.5	20.0	25.5	32.5	17.5%	25.5%	27.7%
15	26.0	35.5	43.0	20.2	26.0	32.5	28.7%	36.5%	32.3%
16	28.0	36.5	45.1	20.5	26.5	33.0	36.6%	37.7%	36.7%
17	28.0	38.0	47.0	21.5	27.0	35.0	30.2%	40.7%	34.3%

98. Similarly, using data from Taylor (2010; table 2, at 869) which analyzed vertical jump measurements of 1,845 children aged 10 -15 years in primary and secondary schools in the East of England, the following table sampling the low, middle, and top decile for vertical jump can be constructed:

Vertical Jump Height (cm) for children 10 -15 years

Age	Male			Female			Male-Female % Difference		
	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile	10th %ile	50th %ile	90th %ile
10	16.00	21.00	29.00	15.00	22.00	27.00	6.7%	-4.5%	7.4%
11	20.00	27.00	34.00	19.00	25.00	32.00	5.3%	8.0%	6.3%
12	23.00	30.00	37.00	21.00	27.00	33.00	9.5%	11.1%	12.1%
13	23.00	32.00	40.00	21.00	26.00	34.00	9.5%	23.1%	17.6%
14	26.00	36.00	44.00	21.00	28.00	34.00	23.8%	28.6%	29.4%
15	29.00	37.00	44.00	21.00	28.00	39.00	38.1%	32.1%	12.8%

99. As can be seen from the data from Ramírez-Vélez (2017) and Taylor (2010), males consistently outperform females of the same age and percentile in vertical jump height. Both sets of data show that an 11-year-old boy in the 90th percentile for vertical jump height will outperform girls in the 90th percentile at ages 11 and 12, and will be equal to girls at ages 13, 14, and possibly 15. These data indicate that an 11-year-old would be likely to have an advantage over girls of the same age and older in sports such as volleyball where “absolute vertical jump

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values can differentiate players not only in terms of player position and performance level but in their career trajectories.” (Pocek 2021 at 8382.)

100. Boys also enjoy an advantage in throwing well before puberty. “Boys exceed girls in throwing velocity by 1.5 standard deviation units as early as 4 to 7 years of age. . . The boys exceed the girls [in throwing distance] by 1.5 standard deviation units as early as 2 to 4 years of age.” (Thomas 1985 at 266.) This means that the average 4- to 7-year-old boy can out-throw approximately 87% of all girls of his age.

101. Record data from USA Track & Field indicate that boys outperform girls in track events even in the youngest age group for whom records are kept (age 8 and under).⁸

American Youth Outdoor Track & Field Record times in age groups 8 and under (time in seconds)

Event	Boys	Girls	Difference
100M	13.65	13.78	0.95%
200M	27.32	28.21	3.26%
400M	62.48	66.10	5.79%
800M	148.59	158.11	6.41%
1500M	308.52	314.72	2.01%
Mean			3.68%

102. Looking at the best times within a single year shows a similar pattern of consistent advantage for even young boys. I consider the 2018 USATF Region 8 Junior Olympic Championships for the youngest age group (8 and under).⁹

2018 USATF Region 8 Junior Olympic Championships for the 8 and under age group

Event	Boys	Girls	Difference
100M	15.11	15.64	3.51%
200M	30.79	33.58	9.06%
400M	71.12	77.32	8.72%
800M	174.28	180.48	3.56%
1500M	351.43	382.47	8.83%
Mean			6.74%

⁸<http://legacy.usatf.org/statistics/records/view.asp?division=american&location=outdoor%20track%20%26%20field&age=youth&sport=TF>

⁹ <https://www.athletic.net/TrackAndField/meet/384619/results/m/1/100m>

⁹ <https://www.athletic.net/CrossCountry/Division/List.aspx?DivID=62211>

103. Using Athletic.net⁹, for 2021 Cross Country and Track & Field data for boys and girls in the 7-8, 9-10, and 11-12 year old age group club reports, and for 5th, 6th, and 7th grade for the whole United States I have compiled the tables for 3000 m events, and for the 100-m, 200-m, 400-m, 800-m, 1600-m, 3000-m, long jump, and high jump Track and Field data to illustrate the differences in individual athletic performance between boys and girls, all of which appear in the Appendix. The pattern of males outperforming females was consistent across events, with rare anomalies, only varying in the magnitude of difference between males and females.

104. Similarly, using Athletic.net, for 2021 Track & Field data for boys and girls in the 6th grade for the state of West Virginia, I have compiled tables, which appear in the appendix, comparing the performance of boys and girls for the 100-m, 200-m, 400-m, 800-m, 1600-m, and 3200-m running events in which the 1st place boy was consistently faster than the 1st place girl, and the average performance of the top 10 boys was consistently faster than the average performance for the top 10 girls. Based on the finishing times for the 1st place boy and girl in the 6th grade in West Virginia 1600-m race, and extrapolating the running time to a running pace, the 1st place boy would be expected to finish 273 m in front of the 1st place girl, which is 2/3 of a lap on a standard 400-m track, or almost the length of 3 football fields. In comparison, the 1st place boy would finish 66 m in front of the 2nd place boy, and the 1st place girl would finish 20 m in front of the 2nd place girl.

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Top 10 West Virginia boys and girls 6th grade outdoor track for 2021 (time in seconds)

	100 m			200 m			400 m		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	13.18	14.00	Difference between #1 boy and #1 girl	26.97	29.28	Difference between #1 boy and #1 girl	60.04	65.50	Difference between #1 boy and #1 girl
2	13.94	14.19		29.38	30.05		60.48	67.51	
3	14.07	14.47	5.9%	30.09	30.34	7.9%	66.26	68.60	8.3%
4	14.44	14.86		30.10	30.73		67.12	70.43	
5	14.46	14.92	Average difference boys vs girls	30.24	31.00	Average difference boys vs girls	68.28	71.09	Average difference boys vs girls
6	14.53	15.04		30.38	31.04		68.36	71.38	
7	14.75	15.04	2.9%	30.54	31.10	2.4%	69.65	73.61	5.6%
8	14.78	15.20		30.69	31.10		69.70	73.87	
9	14.84	15.25		30.74	31.35		69.76	74.07	
10	14.94	15.28		30.99	31.64		70.63	74.21	

	800 m			1600 m			3200 m		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	147.2	164.5	Difference between #1 boy and #1 girl	305.5	357.8	Difference between #1 boy and #1 girl	678.4	776.6	Difference between #1 boy and #1 girl
2	147.9	166.1		318.1	361.6		750.0	809.8	
3	152.1	167.2	10.6%	322.0	379.8	14.6%	763.3	811.0	12.7%
4	153.2	170.2		336.0	385.2		766.3	843.0	
5	155.3	171.0	Average difference boys vs girls	342.2	390.2	Average difference boys vs girls	771.7	850.6	Average difference boys vs girls
6	159.5	171.5		348.0	392.0		782.8	852.1	
7	159.9	174.8	7.5%	356.6	393.3	11.5%	794.1	858.0	8.1%
8	167.8	174.9		357.5	395.7		803.0	862.8	
9	169.2	175.9		362.4	398.1		812.1	869.9	
10	172.6	177.6		366.0	403.2		814.3	883.3	

105. As serious runners will recognize, differences of 3%, 5%, or 8% are not easily overcome. During track competition the difference between first and second place, or second and third place, or third and fourth place (and so on) is often 0.5 - 0.7%, with some contests being determined by as little as 0.01%.

106. I performed an analysis of running events (consisting of the 100-m, 200-m, 400-m, 800-m, 1500-m, 5000-m, and 10,000-m) in the Division 1, Division 2, and Division 3 NCAA Outdoor championships for the years of 2010-2019: the mean difference between 1st and 2nd place was 0.48% for men and 0.86% for women. The mean difference between 2nd and 3rd place was 0.46% for men and 0.57% for women. The mean difference between 3rd place and 4th place was 0.31% for men and 0.44% for women. The mean difference between 1st place and 8th place (the last place to earn the title of All American) was 2.65% for men and 3.77% for women. (Brown et al. Unpublished observations, to be presented at the 2022 Annual Meeting of the American College of Sports Medicine.)

107. A common response to empirical data showing pre-pubertal performance advantages in boys is the argument that the performance of boys may

represent a social–cultural bias for boys to be more physically active, rather than representing inherent sex-based differences in pre-pubertal physical fitness. However, the younger the age at which such differences are observed, and the more egalitarian the culture within which they are observed, the less plausible this hypothesis becomes. Eiberg et al. (2005) measured body composition, VO₂max, and physical activity in 366 Danish boys and 332 Danish girls between the ages of 6 and 7 years old. Their observations indicated that VO₂max was 11% higher in boys than girls. When expressed relative to body mass the boys' VO₂max was still 8% higher than the girls. The authors stated that "...no differences in haemoglobin or sex hormones¹⁰ have been reported in this age group," yet "... when children with the same VO₂max were compared, boys were still more active, and in boys and girls with the same P[hysical] A[ctivity] level, boys were fitter." (728). These data indicate that in pre-pubertal children, in a very egalitarian culture regarding gender roles and gender norms, boys still have a measurable advantage in regards to aerobic fitness when known physiological and physical activity differences are accounted for.

108. And, as I have mentioned above, even by the age of 4 or 5, in a ruler-drop test, boys exhibit 4% to 6% faster reaction times than girls. (Latorre-Roman 2018.)

109. When looking at the data on testosterone concentrations previously presented, along with the data on physical fitness and athletic performance presented, boys have advantages in athletic performance and physical fitness before there are marked differences in testosterone concentrations between boys and girls.

110. For the most part, the data I review above relate to pre-pubertal children. Today, we also face the question of inclusion in female athletics of males who have undergone "puberty suppression." The UK Sport Councils Literature Review notes that, "In the UK, so-called 'puberty blockers' are generally not used until Tanner maturation stage 2-3 (i.e. after puberty has progressed into early sexual maturation)." (9.) While it is outside my expertise, my understanding is that current practice with regard to administration of puberty blockers is similar in the United States. Tanner stages 2 and 3 generally encompass an age range from 10 to 14 years old, with significant differences between individuals. Like the authors of the UK Sports Council Literature Review, I am "not aware of research" directly addressing the implications for athletic capability of the use of puberty blockers. (UK Sport Councils Literature Review at 9.) As Handelsman documents, the male advantage begins to increase rapidly—along with testosterone levels—at about age 11, or "very closely aligned to the timing of the onset of male puberty." (Handelsman 2017.) It seems likely that males who have undergone puberty suppression will

¹⁰ This term would include testosterone and estrogens.

have physiological and performance advantages over females somewhere between those possessed by pre-pubertal boys, and those who have gone through full male puberty, with the degree of advantage in individual cases depending on that individual's development and the timing of the start of puberty blockade.

111. Tack et al. (2018) observed that in 21 transgender-identifying biological males, administration of antiandrogens for 5-31 months (commencing at 16.3 ± 1.21 years of age), resulted in nearly, but not completely, halting of normal age-related *increases* in muscle strength. Importantly, muscle strength did not decrease after administration of antiandrogens. Rather, despite antiandrogens, these individuals retained higher muscle mass, lower percent body fat, higher body mass, higher body height, and higher grip strength than comparable girls of the same age. (Supplemental tables).

112. Klaver et al. (2018 at 256) demonstrated that the use of puberty blockers did not eliminate the differences in lean body mass between biological male and female teenagers. Subsequent use of puberty blockers combined with cross-sex hormone use (in the same subjects) still did not eliminate the differences in lean body mass between biological male and female teenagers. Furthermore, by 22 years of age, the use of puberty blockers, and then puberty blockers combined with cross sex hormones, and then cross hormone therapy alone for over 8 total years of treatment still had not eliminated the difference in lean body mass between biological males and females.

113. The effects of puberty blockers on growth and development, including muscle mass, fat mass, or other factors that influence athletic performance, have been minimally researched. Indeed, Klaver et al. (2018) is the only published research that I am aware of that has evaluated the use of puberty blockers on body composition. As stated by Roberts and Carswell (2021), "No published studies have fully characterized the impact of [puberty blockers on] final adult height or current height in an actively growing TGD youth." (1680). Likewise, "[n]o published literature provides guidance on how to best predict the final adult height for TGD youth receiving GnRHa and gender-affirming hormonal treatment." (1681). Thus, the effect of prescribing puberty blockers to a male child before the onset of puberty on the physical components of athletic performance is largely unknown. There is not any scientific evidence that such treatment eliminates the pre-existing performance advantages that prepubertal males have over prepubertal females.

B. The rapid increase in testosterone across male puberty drives characteristic male physiological changes and the increasing performance advantages.

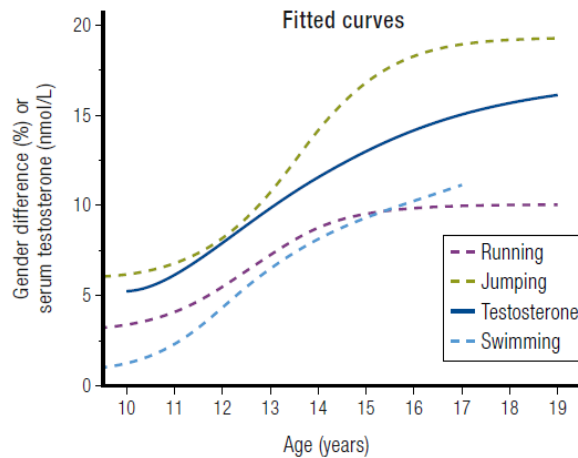
114. While boys exhibit some performance advantage even before puberty, it is both true and well known to common experience that the male advantage

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increases rapidly, and becomes much larger, as boys undergo puberty and become men. Empirically, this can be seen by contrasting the modest advantages reviewed immediately above against the large performance advantages enjoyed by men that I have detailed in Section II.

115. Multiple studies (along with common observation) document that the male performance advantage begins to increase during the early years of puberty, and then increases rapidly across the middle years of puberty (about ages 12-16). (Tønnessen 2015; Handelsman 2018 at 812-813.) Since it is well known that testosterone levels increase by more than an order of magnitude in boys across puberty, it is unsurprising that Handelsman finds that these increases in male performance advantage correlate to increasing testosterone levels, as presented in his chart reproduced below. (Handelsman 2018 at 812-13.)



116. Handelsman further finds that certain characteristic male changes including boys' increase in muscle mass do not begin at all until "circulating testosterone concentrations rise into the range of males at mid-puberty, which are higher than in women at any age." (Handelsman 2018 at 810.)

117. Knox et al. (2019) agree that "[i]t is well recognised that testosterone contributes to physiological factors including body composition, skeletal structure, and the cardiovascular and respiratory systems across the life span, with significant influence during the pubertal period. These physiological factors underpin strength, speed, and recovery with all three elements required to be competitive in almost all sports." (Knox 2019 at 397.) "High testosterone levels and prior male physiology provide an all-purpose benefit, and a substantial advantage. As the IAAF says, "To the best of our knowledge, there is no other genetic or biological trait encountered in female athletics that confers such a huge performance advantage." (Knox 2019 at 399.)

118. However, the undisputed fact that high (that is, normal male) levels of testosterone drive the characteristically male physiological changes that occur across male puberty does not at all imply that artificially *depressing* testosterone levels after those changes occur will reverse all or most of those changes so as to eliminate the male athletic advantage. This is an empirical question. As it turns out, the answer is that while some normal male characteristics can be changed by means of testosterone suppression, others cannot be, and all the reliable evidence indicates that males retain large athletic advantages even after long-term testosterone suppression.

V. The available evidence shows that suppression of testosterone in a male after puberty has occurred does not substantially eliminate the male athletic advantage.

119. The 2011 “NCAA Policy on Transgender Student-Athlete Participation” requires only that males who identify as transgender be on unspecified and unquantified “testosterone suppression treatment” for “one calendar year” prior to competing in women’s events. In supposed justification of this policy, the NCAA’s Office of Inclusion asserts that, “It is also important to know that any strength and endurance advantages a transgender woman arguably may have as a result of her prior testosterone levels dissipate after about one year of estrogen or testosterone-suppression therapy.” (NCAA 2011 at 8.)

120. Similarly, writing in 2018, Handelsman et al. could speculate that even though some male advantages established during puberty are “fixed and irreversible (bone size),” “[t]he limited available prospective evidence . . . suggests that the advantageous increases in muscle and hemoglobin due to male circulating testosterone concentrations are induced or reversed during the first 12 months.” (Handelsman 2018 at 824.)

121. But these assertions or hypotheses of the NCAA and Handelsman are now strongly contradicted by the available science. In this section, I examine what is known about whether suppression of testosterone in males can eliminate the male physiological and performance advantages over females.

A. Empirical studies find that males retain a strong performance advantage even after lengthy testosterone suppression.

122. As my review in Section II indicates, a very large body of literature documents the large performance advantage enjoyed by males across a wide range of athletics. To date, only a limited number of studies have directly measured the effect of testosterone suppression and the administration of female hormones on the athletic performance of males. These studies report that testosterone suppression for a full year (and in some cases much longer) does not come close to eliminating

male advantage in strength (hand grip, leg strength, and arm strength) or running speed.

Hand Grip Strength

123. As I have noted, hand grip strength is a well-accepted proxy for general strength. Multiple separate studies, from separate groups, report that males retain a large advantage in hand strength even after testosterone suppression to female levels.

124. In a longitudinal study, Van Caenegem et al. reported that males who underwent standard testosterone suppression protocols lost only 7% hand strength after 12 months of treatment, and only a cumulative 9% after two years. (Van Caenegem 2015 at 42.) As I note above, on average men exhibit in the neighborhood of 60% greater hand grip strength than women, so these small decreases do not remotely eliminate that advantage. Van Caenegem et al. document that their sample of males who elected testosterone suppression began with less strength than a control male population. Nevertheless, after one year of suppression, their study population still had hand grip only 21% less than the control male population, and thus still far higher than a female population. (Van Caenegem 2015 at 42.)

125. Scharff et al. (2019) measured grip strength in a large cohort of male-to-female subjects from before the start of hormone therapy through one year of hormone therapy. The hormone therapy included suppression of testosterone to less than 2 nm/L “in the majority of the transwomen,” (1024), as well as administration of estradiol (1021). These researchers observed a small decrease in grip strength in these subjects over that time (Fig. 2), but mean grip strength of this group remained far higher than mean grip strength of females—specifically, “After 12 months, the median grip strength of transwomen [male-to-female subjects] still falls in the 95th percentile for age-matched females.” (1026).

126. Still a third longitudinal study, looking at teen males undergoing testosterone suppression, “noted no change in grip strength after hormonal treatment (average duration 11 months) of 21 transgender girls.” (Hilton 2021 at 207, summarizing Tack 2018.)

127. In a fourth study, Lapauw et al. (2008) looked at the extreme case of testosterone suppression by studying a population of 23 biologically male individuals who had undergone at least two years of testosterone suppression, followed by sex reassignment surgery that included “orchidectomy” (that is, surgical castration), and then at least an additional three years before the study date. Comparing this group against a control of age- and height-matched healthy males, the researchers found that the individuals who had gone through testosterone suppression and then surgical castration had an average hand grip (41 kg) that was

24% weaker than the control group of healthy males. But this remains at least 25% *higher* than the average hand-grip strength of biological females as measured by Bohannon et al. (2019).

128. Summarizing these and a few other studies measuring strength loss (in most cases based on hand grip) following testosterone suppression, Harper et al. (2021) conclude that “strength loss with 12 months of [testosterone suppression] . . . ranged from non-significant to 7%. . . [T]he small decrease in strength in transwomen after 12-36 months of [testosterone suppression] suggests that transwomen likely retain a strength advantage over cisgender women.” (Hilton 2021 at 870.)

Arm Strength

129. Lapauw et al. (2008) found that 3 years after surgical castration, preceded by at least two years of testosterone suppression, biologically male subjects had 33% less bicep strength than healthy male controls. (Lapauw (2008) at 1018.) Given that healthy men exhibit between 89% and 109% greater arm strength than healthy women, this leaves a very large residual arm strength advantage over biological women.

130. Roberts et al. have recently published an interesting longitudinal study, one arm of which considered biological males who began testosterone suppression and cross-sex hormones while serving in the United States Air Force. (Roberts 2020.) One measured performance criterion was pushups per minute, which, while not exclusively, primarily tests arm strength under repetition. *Before* treatment, the biological male study subjects who underwent testosterone suppression could do 45% more pushups per minute than the average for all Air Force women under the age of 30 (47.3 vs. 32.5). *After* between one and two years of testosterone suppression, this group could still do 33% more pushups per minute. (Table 4.) Further, the body weight of the study group did not decline at all after one to two years of testosterone suppression (in fact rose slightly) (Table 3), and was approximately 24 pounds (11.0 kg) higher than the average for Air Force women under the age of 30. (Roberts 2020 at 3.) This means that the individuals who had undergone at least one year of testosterone suppression were not only doing 1/3 more pushups per minute, but were lifting significantly more weight with each pushup.

131. After two years of testosterone suppression, the study sample in Roberts et al. was only able to do 6% more pushups per minute than the Air Force female average. But their weight remained unchanged from their pre-treatment starting point, and thus about 24 pounds higher than the Air Force female average. As Roberts et al. explain, “as a group, transwomen weigh more than CW [cis-women]. Thus, transwomen will have a higher power output than CW when

performing an equivalent number of push-ups. Therefore, our study may underestimate the advantage in strength that transwomen have over CW.” (Roberts 2020 at 4.)

Leg Strength

132. Wiik et al. (2020), in a longitudinal study that tracked 11 males from the start of testosterone suppression through 12 months after treatment initiation, found that isometric strength levels measured at the knee “were maintained over the [study period].”¹¹ (808) “At T12 [the conclusion of the one-year study], the absolute levels of strength and muscle volume were greater in [male-to-female subjects] than in . . . CW [women who had not undergone any hormonal therapy].” (Wiik 2020 at 808.) In fact, Wiik et al. reported that “muscle strength after 12 months of testosterone suppression was comparable to baseline strength. As a result, transgender women remained about 50% stronger than . . . a reference group of females.” (Hilton 2021 at 207, summarizing Wiik 2020.)

133. Lapauw et al. (2008) found that 3 years after surgical castration, preceded by at least two years of testosterone suppression, subjects had peak knee torque only 25% lower than healthy male controls. (Lapauw 2008 at 1018.) Again, given that healthy males exhibit 54% greater maximum knee torque than healthy females, this leaves these individuals with a large average strength advantage over females even years after sex reassignment surgery.

Running speed

134. The most striking finding of the recent Roberts et al. study concerned running speed over a 1.5 mile distance—a distance that tests midrange endurance. Before suppression, the MtF study group ran 21% faster than the Air Force female average. After at least 2 year of testosterone suppression, these subjects still ran 12% faster than the Air Force female average. (Roberts 2020 Table 4.)

135. The specific experience of the well-known case of NCAA athlete Cece Telfer is consistent with the more statistically meaningful results of Roberts et al., further illustrating that male-to-female transgender treatment does not negate the inherent athletic performance advantages of a post-pubertal male. In 2016 and 2017 Cece Telfer competed as Craig Telfer on the Franklin Pierce University men’s track team, being ranked 200th and 390th (respectively) against other NCAA Division 2 men. “Craig” Telfer did not qualify for the National Championships in any events. Telfer did not compete in the 2018 season while undergoing testosterone

¹¹ Isometric strength measures muscular force production for a given amount of time at a specific joint angle but with no joint movement.

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suppression (per NCAA policy). In 2019 Cece Telfer competed on the Franklin Pierce University *women's* team, qualified for the NCAA Division 2 Track and Field National Championships, and placed 1st in the women's 400 meter hurdles and placed third in the women's 100 meter hurdles. (For examples of the media coverage of this please see <https://www.washingtontimes.com/news/2019/jun/3/cece-telfer-franklin-pierce-transgenderhurdler-wi/> last accessed May 29, 2020. <https://www.newshub.co.nz/home/sport/2019/06/athletics-transgender-woman-cece-telfer-who-previously-competed-as-a-man-wins-ncaa-track-championship.html> (last accessed May 29, 2020).)

136. The table below shows the best collegiate performance times from the combined 2015 and 2016 seasons for Cece Telfer when competing as a man in men's events, and the best collegiate performance times from the 2019 season when competing as a woman in women's events. Comparing the times for the running events (in which male and female athletes run the same distance) there is no statistical difference between Telfer's "before and after" times. Calculating the difference in time between the male and female times, Telfer performed an average of 0.22% *faster* as a female. (Comparing the performance for the hurdle events (marked with H) is of questionable validity due to differences between men's and women's events in hurdle heights and spacing, and distance for the 110m vs. 100 m.) While this is simply one example, and does not represent a controlled experimental analysis, this information provides some evidence that male-to-female transgender treatment does not negate the inherent athletic performance advantages of a postpubertal male. (These times were obtained from https://www.tfrrs.org/athletes/6994616/Franklin_Pierce/CeCe_Telfer.html and <https://www.tfrrs.org/athletes/5108308.html>, last accessed May 29, 2020).

As Craig Telfer (male athlete)		As Cece Telfer (female athlete)	
Event	Time (seconds)	Event	Time (seconds)
55	7.01	55	7.02
60	7.67	60	7.63
100	12.17	100	12.24
200	24.03	200	24.30
400	55.77	400	54.41
55 H †	7.98	55 H †	7.91
60 H †	8.52	60 H †	8.33
110 H †	15.17	100 H †	13.41*
400 H ‡	57.34	400 H ‡	57.53**

* women's 3rd place, NCAA Division 2 National Championships

** women's 1st place, NCAA Division 2 National Championships

† men's hurdle height is 42 inches with differences in hurdle spacing between men and women

‡ men's hurdle height is 36 inches, women's height is 30 inches with the same spacing between hurdles

137. Similarly, University of Pennsylvania swimmer Lia Thomas began competing in the women's division in the fall of 2021, after previously competing for U. Penn. in the men's division. Thomas has promptly set school, pool, and/or league women's records in 200 yard freestyle, 500 yard freestyle, and 1650 yard freestyle competitions, beating the nearest female in the 1650 yard by an unheard-of 38 seconds.

138. In a pre-peer review article, Senefeld, Coleman, Hunter, and Joyner (doi: <https://doi.org/10.1101/2021.12.28.21268483>, accessed January 12, 2022) "compared the gender-related differences in performance of a transgender swimmer who competed in both the male and female NCAA (collegiate) categories to the sex-related differences in performance of world and national class swimmers" and observed that this athlete [presumably Lia Thomas based on performance times and the timing of this article] was unranked in 2018-2019 in the 100-yard, ranked 551st in the 200-yard, 65th in the 500-yard 32nd in the 1650-yards men's freestyle. After following the NCAA protocol for testosterone suppression and competing as a woman in 2021-2022, this swimmer was ranked 94th in the 100-yard, 1st in the 200-yard, 1st in the 500-yard, and 6th in the 1650-yard women's freestyle. The performance times swimming as a female, when compared to swimming as a male, were 4.6% slower in the 100-yard, 2.6% slower in the 200-yard, 5.6% slower in the 500-yard, and 6.8% slower in the 1650-yard events than when swimming as a male. *It is important to note that these are mid-season race times and do not represent season best performance times or in a championship event where athletes often set their personal record times.* The authors concluded "...that for middle distance events (100, 200 and 400m or their imperial equivalents) lasting between about one and five minutes, the decrements in performance of the transgender woman swimmer are less than expected on the basis of a comparison of a large cohort of world and national class performances by female and male swimmers" and "it is possible that the relative improvements in this swimmer's rankings in the women's category relative to the men's category are due to legacy effects of testosterone on a number of physiological factors that can influence athletic performance."

139. Harper (2015) has often been cited as "proving" that testosterone suppression eliminates male advantage. And indeed, hedged with many disclaimers, the author in that article does more or less make that claim with respect to "distance races," while emphasizing that "the author makes no claims as to the equality of performances, pre and post gender transition, in any other sport." (Harper 2015 at 8.) However, Harper (2015) is in effect a collection of unverified anecdotes, not science. It is built around self-reported race times from just eight self-selected transgender runners, recruited "mostly" online. How and on what websites the subjects were recruited is not disclosed, nor is anything said about how those not recruited online were recruited. Thus, there is no information to tell us whether these eight runners could in any way be representative, and the

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recruitment pools and methodology, which could bear on ideological bias in their self-reports, is not disclosed.

140. Further, the self-reported race times relied on by Harper (2015) *span 29 years*. It is well known that self-reported data, particularly concerning emotionally or ideologically fraught topics, is unreliable, and likewise that memory of distant events is unreliable. Whether the subjects were responding from memory or from written records, and if so what records, is not disclosed, and does not appear to be known to the author. For six of the subjects, the author claims to have been able to verify “approximately half” of the self-reported times. Which scores these are is not disclosed. The other two subjects responded only anonymously, so nothing about their claims could be or was verified. In short, neither the author nor the reader knows whether the supposed “facts” on which the paper’s analysis is based are true.

141. Even if we could accept them at face value, the data are largely meaningless. Only two of the eight study subjects reported (undefined) “stable training patterns,” and even with consistent training, athletic performance generally declines with age. As a result, when the few data points span 29 years, it is not possible to attribute declines in performance to asserted testosterone suppression. Further, distance running is usually not on a track, and race times vary significantly depending on the course and the weather. Only one reporting subject who claimed a “stable training pattern” reported “before and after” times on the same course within three years’ time,” which the author acknowledges would “represent the best comparison points.”

142. Harper (2015) to some extent acknowledges its profound methodological flaws, but seeks to excuse them by the difficulty of breaking new ground. The author states that, “The first problem is how to formulate a study to create a meaningful measurement of athletic performance, both before and after testosterone suppression. No methodology has been previously devised to make meaningful measurements.” (2) This statement was not accurate at the time of publication, as there are innumerable publications with validated methodology for comparing physical fitness and/or athletic performance between people of different ages, sexes, and before and after medical treatment, any of which could easily have been used with minimal or no adaptation for the purposes of this study. Indeed, well before the publication of Harper (2015), several authors that I have cited in this review had performed and published disciplined and methodologically reliable studies of physical performance and physiological attributes “before and after” testosterone suppression.

143. More recently, and to her credit, Harper has acknowledged the finding of Roberts (2020) regarding the durable male advantage in running speed in the 1.5 mile distance, even after two years of testosterone suppression. She joins with co-

authors in acknowledging that this study of individuals who (due to Air Force physical fitness requirements) “could at least be considered exercise trained,” agrees that Roberts’ data shows that “transwomen ran significantly faster during the 1.5 mile fitness test than ciswomen,” and declares that this result is “consistent with the findings of the current review in untrained transgender individuals” that even 30 months of testosterone suppression does not eliminate all male advantages “associated with muscle endurance and performance.” (Harper 2021 at 8.) The Harper (2021) authors conclude overall “that strength may be well preserved in transwomen during the first 3 years of hormone therapy,” and that [w]hether transgender and cisgender women can engage in meaningful sport [in competition with each other], even after [testosterone suppression], is a highly debated question.” (Harper 2021 at 1, 8.)

144. Higerd (2021) “[a]ssess[ed] the probability of a girls’ champion being biologically male” by evaluating 920,11 American high school track and field performances available through the track and field database Athletic.net in five states (CA, FL, MN, NY, WA), over three years (2017 – 2019), in eight events; high jump, long jump, 100M, 200M, 400M, 800M, 1600M, and 3200M and estimated that “there is a simulated 81%-98% probability of transgender dominance occurring in the female track and field event” and further concluded that “in the majority of cases, the entire podium (top of the state) would be MTF [transgender athletes]” (at xii).

B. Testosterone suppression does not reverse important male physiological advantages.

145. We see that, once a male has gone through male puberty, later testosterone suppression (or even castration) leaves large strength and performance advantages over females in place. It is not surprising that this is so. What is now a fairly extensive body of literature has documented that many of the specific male physiological advantages that I reviewed in Section II are not reversed by testosterone suppression after puberty, or are reduced only modestly, leaving a large advantage over female norms still in place.

146. Handelsman has well documented that the large increases in physiological and performance advantages characteristic of men develop in tandem with, and are likely driven by, the rapid and large increases in circulating testosterone levels that males experience across puberty, or generally between the ages of about 12 through 18. (Handelsman 2018.) Some have misinterpreted Handelsman as suggesting that all of those advantages are and remain entirely dependent—on an ongoing basis—on *current* circulating testosterone levels. This is a misreading of Handelsman, who makes no such claim. As the studies reviewed above demonstrate, it is also empirically false with respect to multiple measures of

performance. Indeed, Handelsman himself, referring to the Roberts et al. (2020) study which I describe below, has recently written that “transwomen treated with estrogens after completing male puberty experienced only minimal declines in physical performance over 12 months, substantially surpassing average female performance for up to 8 years.” (Handelsman 2020.)

147. As to individual physiological advantages, the more accurate and more complicated reality is reflected in a statement titled “The Role of Testosterone in Athletic Performance,” published in 2019 by several dozen sports medicine experts and physicians from many top medical schools and hospitals in the U.S. and around the world. (Levine et al. 2019.) This expert group concurs with Handelsman regarding the importance of testosterone to the male advantage, but recognizes that those advantages depend not only on *current* circulating testosterone levels in the individual, but on the “exposure in biological males to much higher levels of testosterone during growth, development, and throughout the athletic career.” (*Emphasis added.*) In other words, both past and current circulating testosterone levels affect physiology and athletic capability.

148. Available research enables us to sort out, in some detail, which specific physiological advantages are immutable once they occur, which can be reversed only in part, and which appear to be highly responsive to later hormonal manipulation. The bottom line is that very few of the male physiological advantages I have reviewed in Section II above are largely reversible by testosterone suppression once an individual has passed through male puberty.

Skeletal Configuration

149. It is obvious that some of the physiological changes that occur during “growth and development” across puberty cannot be reversed. Some of these irreversible physiological changes are quite evident in photographs that have recently appeared in the news of transgender competitors in female events. These include skeletal configuration advantages including:

- Longer and larger bones that give height, weight, and leverage advantages to men;
- More advantageous hip shape and configuration as compared to women.

Cardiovascular Advantages

150. Developmental changes for which there is no apparent means of reversal, and no literature suggesting reversibility, also include multiple

contributors to the male cardiovascular advantage, including diaphragm placement, lung and trachea size, and heart size and therefore pumping capacity.¹²

151. On the other hand, the evidence is mixed as to hemoglobin concentration, which as discussed above is a contributing factor to $\dot{V}O_2$ max. Harper (2021) surveyed the literature and found that “Nine studies reported the levels of Hgb [hemoglobin] or HCT [red blood cell count] in transwomen before and after [testosterone suppression], from a minimum of three to a maximum of 36 months post hormone therapy. Eight of these studies. . . found that hormone therapy led to a significant (4.6%–14.0%) decrease in Hgb/HCT ($p < 0.01$), while one study found no significant difference after 6 months,” but only one of those eight studies returned results at the generally accepted 95% confidence level. (Harper 2021 at 5-6 and Table 5.)

152. I have not found any study of the effect of testosterone suppression on the male advantage in mitochondrial biogenesis.

Muscle mass

153. Multiple studies have found that muscle mass decreases modestly or not at all in response to testosterone suppression. Knox et al. report that “healthy young men did not lose significant muscle mass (or power) when their circulating testosterone levels were reduced to 8.8 nmol/L (lower than the 2015 IOC guideline of 10 nmol/L) for 20 weeks.” (Knox 2019 at 398.) Gooren found that “[i]n spite of muscle surface area reduction induced by androgen deprivation, after 1 year the mean muscle surface area in male-to- female transsexuals remained significantly greater than in untreated female-to-male transsexuals.” (Gooren 2011 at 653.) An earlier study by Gooren found that after one year of testosterone suppression, muscle mass at the thigh was reduced by only about 10%, exhibited “no further reduction after 3 years of hormones,” and “remained significantly greater” than in his sample of untreated women. (Gooren 2004 at 426-427.) Van Caenegem et al. found that muscle cross section in the calf and forearm decreased only trivially (4% and 1% respectively) after two years of testosterone suppression. (Van Caenegem 2015 Table 4.)

154. Taking measurements one month after start of testosterone suppression in male-to-female (non-athlete) subjects, and again 3 and 11 months after start of feminizing hormone replacement therapy in these subjects, Wiik et al.

¹² “[H]ormone therapy will not alter ... lung volume or heart size of the transwoman athlete, especially if [that athlete] transitions postpuberty, so natural advantages including joint articulation, stroke volume and maximal oxygen uptake will be maintained.” (Knox 2019 at 398.)

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found that total lean tissue (i.e. primarily muscle) did not decrease significantly across the entire period. Indeed, “some of the [subjects] did not lose any muscle mass at all.” (Wiik 2020 at 812.) And even though they observed a small decrease in thigh muscle mass, they found that isometric strength levels measured at the knee “were maintained over the [study period].” (808) “At T12 [the conclusion of the one-year study], the absolute levels of strength and muscle volume were greater in [male-to-female subjects] than in [female-to-male subjects] and CW [women who had not undergone any hormonal therapy].” (808)

155. Hilton & Lundberg summarize an extensive survey of the literature as follows:

“12 longitudinal studies have examined the effects of testosterone suppression on lean body mass or muscle size in transgender women. The collective evidence from these studies suggests that 12 months, which is the most commonly examined intervention period, of testosterone suppression to female typical reference levels results in a modest (approximately– 5%) loss of lean body mass or muscle size. . . .

“Thus, given the large baseline differences in muscle mass between males and females (Table 1; approximately 40%), the reduction achieved by 12 months of testosterone suppression can reasonably be assessed as small relative to the initial superior mass. We, therefore, conclude that the muscle mass advantage males possess over females, and the performance implications thereof, are not removed by the currently studied durations (4 months, 1, 2 and 3 years) of testosterone suppression in transgender women. (Hilton 2021 at 205-207.)

156. When we recall that “women have 50% to 60% of men’s upper arm muscle cross-sectional area and 65% to 70% of men’s thigh muscle cross-sectional area” (Handelsman 2018 at 812), it is clear that Hilton’s conclusion is correct. In other words, biologically male subjects possess substantially larger muscles than biologically female subjects after undergoing a year or even three years of testosterone suppression.

157. I note that outside the context of transgender athletes, the testosterone-driven increase in muscle mass and strength enjoyed by these male-to-female subjects would constitute a disqualifying doping violation under all league anti-doping rules with which I am familiar.

C. Responsible voices internationally are increasingly recognizing that suppression of testosterone in a male after puberty has occurred does not substantially reverse the male athletic advantage.

158. The previous very permissive NCAA policy governing transgender participation in women's collegiate athletics was adopted in 2011, and the previous IOC guidelines were adopted in 2015. At those dates, much of the scientific analysis of the actual impact of testosterone suppression had not yet been performed, much less any wider synthesis of that science. In fact, a series of important peer-reviewed studies and literature reviews have been published only very recently, since I prepared my first paper on this topic, in early 2020.

159. These new scientific publications reflect a remarkably consistent consensus: once an individual has gone through male puberty, testosterone suppression does not substantially eliminate the physiological and performance advantages that that individual enjoys over female competitors.

160. Importantly, I have found no peer-reviewed scientific paper, nor any respected scientific voice, that is now asserting the contrary—that is, that testosterone suppression can eliminate or even largely eliminate the male biological advantage once puberty has occurred.

161. I excerpt the key conclusions from important recent peer-reviewed papers below.

162. Roberts 2020: “In this study, we confirmed that . . . the pretreatment differences between transgender and cis gender women persist beyond the 12-month time requirement currently being proposed for athletic competition by the World Athletics and the IOC.” (6)

163. Wiik 2020: The muscular and strength changes in males undergoing testosterone suppression “were modest. The question of when it is fair to permit a transgender woman to compete in sport in line with her experienced gender identity is challenging.” (812)

164. Harper 2021: “[V]alues for strength, LBM [lean body mass], and muscle area in transwomen remain above those of cisgender women, even after 36 months of hormone therapy.” (1)

165. Hilton & Lundberg 2021: “evidence for loss of the male performance advantage, established by testosterone at puberty and translating in elite athletes to a 10–50% performance advantage, is lacking. . . . These data significantly

undermine the delivery of fairness and safety presumed by the criteria set out in transgender inclusion policies . . .” (211)

166. Hamilton et al. 2020, “Response to the United Nations Human Rights Council’s Report on Race and Gender Discrimination in Sport: An Expression of Concern and a Call to Prioritize Research”: “There is growing support for the idea that development influenced by high testosterone levels may result in retained anatomical and physiological advantages If a biologically male athlete self-identifies as a female, legitimately with a diagnosis of gender dysphoria or illegitimately to win medals, the athlete already possesses a physiological advantage that undermines fairness and safety. This is not equitable, nor consistent with the fundamental principles of the Olympic Charter.”

167. Hamilton et al. 2021, “Consensus Statement of the Fédération Internationale de Médecine du Sport” (International Federation of Sports Medicine, or FIMS), signed by more than 60 sports medicine experts from prestigious institutions around the world: The available studies “make it difficult to suggest that the athletic capabilities of transwomen individuals undergoing HRT or GAS are comparable to those of cisgender women.” The findings of Roberts et al. “question the required testosterone suppression time of 12 months for transwomen to be eligible to compete in women’s sport, as most advantages over ciswomen were not negated after 12 months of HRT.”

168. Outside the forum of peer-reviewed journals, respected voices in sport are reaching the same conclusion.

169. The **Women’s Sports Policy Working Group** identifies among its members and “supporters” many women Olympic medalists, former women’s tennis champion and LGBTQ activist Martina Navratilova, Professor Doriane Coleman, a former All-American women’s track competitor, transgender athletes Joanna Harper and Dr. Renee Richards, and many other leaders in women’s sports and civil rights. I have referenced other published work of Joanna Harper and Professor Coleman. In early 2021 the Women’s Sports Policy Working Group published a “Briefing Book” on the issue of transgender participation in women’s sports,¹³ in which they reviewed largely the same body of literature I have reviewed above, and analyzed the implications of that science for fairness and safety in women’s sports.

170. Among other things, the Women’s Sports Policy Working Group concluded:

¹³ <https://womenssportspolicy.org/wp-content/uploads/2021/02/Congressional-Briefing-WSPWG-Transgender-Women-Sports-2.27.21.pdf>

- “[T]he evidence is increasingly clear that hormones do not eliminate the legacy advantages associated with male physical development” (8) due to “the considerable size and strength advantages that remain even after hormone treatments or surgical procedures.” (17)
- “[T]here is convincing evidence that, depending on the task, skill, sport, or event, trans women maintain male sex-linked (legacy) advantages even after a year on standard gender-affirming hormone treatment.” (26, citing Roberts 2020.)
- “[S]everal peer-reviewed studies, including one based on data from the U.S. military, have confirmed that trans women retain their male sex-linked advantages even after a year on gender affirming hormones. . . . Because of these retained advantages, USA Powerlifting and World Rugby have recently concluded that it isn't possible fairly and safely to include trans women in women's competition.” (32)

171. As has been widely reported, in 2020, after an extensive scientific consultation process, the **World Rugby** organization issued its Transgender Guidelines, finding that it would not be consistent with fairness or safety to permit biological males to compete in World Rugby women's matches, no matter what hormonal or surgical procedures they might have undergone. Based on their review of the science, World Rugby concluded:

- “Current policies regulating the inclusion of transgender women in sport are based on the premise that reducing testosterone to levels found in biological females is sufficient to remove many of the biologically-based performance advantages described above. However, peer-reviewed evidence suggests that this is not the case.”
- “Longitudinal research studies on the effect of reducing testosterone to female levels for periods of 12 months or more do not support the contention that variables such as mass, lean mass and strength are altered meaningfully in comparison to the original male-female differences in these variables. The lowering of testosterone removes only a small proportion of the documented biological differences, with large, retained advantages in these physiological attributes, with the safety and performance implications described previously.”
- “. . . given the size of the biological differences prior to testosterone suppression, this comparatively small effect of testosterone reduction allows substantial and meaningful differences to remain. This has significant implications for the risk of injury”

- “. . . bone mass is typically maintained in transgender women over the course of at least 24 months of testosterone suppression, . . . Height and other skeletal measurements such as bone length and hip width have also not been shown to change with testosterone suppression, and nor is there any plausible biological mechanism by which this might occur, and so sporting advantages due to skeletal differences between males and females appear unlikely to change with testosterone reduction.

172. In September 2021 the government-commissioned Sports Councils of the United Kingdom and its subsidiary parts (the five Sports Councils responsible for supporting and investing in sport across England, Wales, Scotland and Northern Ireland) issued a formal “Guidance for Transgender Inclusion in Domestic Sport” (UK Sport Councils 2021), following an extensive consultation process, and a commissioned “International Research Literature Review” prepared by the Carbmill Consulting group (UK Sport Literature Review 2021). The UK Sport Literature Review identified largely the same relevant literature that I review in this paper, characterizes that literature consistently with my own reading and description, and based on that science reaches conclusions similar to mine.

173. The UK Sport Literature Review 2021 concluded:

- “Sexual dimorphism in relation to sport is significant and the most important determinant of sporting capacity. The challenge to sporting bodies is most evident in the inclusion of transgender people in female sport.” “[The] evidence suggests that parity in physical performance in relation to gender-affected sport cannot be achieved for transgender people in female sport through testosterone suppression. Theoretical estimation in contact and collision sport indicate injury risk is likely to be increased for female competitors.” (10)
- “From the synthesis of current research, the understanding is that testosterone suppression for the mandated one year before competition will result in little or no change to the anatomical differences between the sexes, and a more complete reversal of some acute phase metabolic pathways such as haemoglobin levels although the impact on running performance appears limited, and a modest change in muscle mass and strength: The average of around 5% loss of muscle mass and strength will not reverse the average 40-50% difference in strength that typically exists between the two sexes.” (7)
- “These findings are at odds with the accepted intention of current policy in sport, in which twelve months of testosterone suppression is

expected to create equivalence between transgender women and females.” (7)

174. Taking into account the science detailed in the UK Sport Literature Review 2021, the UK Sports Councils have concluded:

- “[T]he latest research, evidence and studies made clear that there are retained differences in strength, stamina and physique between the average woman compared with the average transgender woman or non-binary person registered male at birth, with or without testosterone suppression.” (3)
- “Competitive fairness cannot be reconciled with self-identification into the female category in gender-affected sport.” (7)
- “As a result of what the review found, the Guidance concludes that the inclusion of transgender people into female sport cannot be balanced regarding transgender inclusion, fairness and safety in gender-affected sport where there is meaningful competition. This is due to retained differences in strength, stamina and physique between the average woman compared with the average transgender woman or non-binary person assigned male at birth, with or without testosterone suppression.” (6)
- “Based upon current evidence, testosterone suppression is unlikely to guarantee fairness between transgender women and natal females in gender-affected sports. . . . Transgender women are on average likely to retain physical advantage in terms of physique, stamina, and strength. Such physical differences will also impact safety parameters in sports which are combat, collision or contact in nature.” (7)

175. On January 15, 2022 the American Swimming Coaches Association (ASCA) issued a statement stating, “The American Swimming Coaches Association urges the NCAA and all governing bodies to work quickly to update their policies and rules to maintain fair competition in the women’s category of swimming. ASCA supports following all available science and evidenced-based research in setting the new policies, and we strongly advocate for more research to be conducted” and further stated “The current NCAA policy regarding when transgender females can compete in the women’s category can be unfair to cisgender females and needs to be reviewed and changed in a transparent manner.” (<https://swimswam.com/asca-issues-statement-calling-for-ncaa-to-review-transgender-rules/>; Accessed January 16, 2022.)

176. On January 19, 2022, the NCAA Board of Governors approved a change to the policy on transgender inclusion in sport and stated that “...the updated NCAA policy calls for transgender participation for each sport to be determined by the policy for the national governing body of that sport, subject to ongoing review and recommendation by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports to the Board of Governors. If there is no N[atational]G[overning]B[ody] policy for a sport, that sport's international federation policy would be followed. If there is no international federation policy, previously established IOC policy criteria would be followed”

(<https://www.ncaa.org/news/2022/1/19/media-center-board-of-governors-updates-transgender-participation-policy.aspx>; Accessed January 20, 2022.)

177. On February 1, 2022, because “...a competitive difference in the male and female categories and the disadvantages this presents in elite head-to-head competition ... supported by statistical data that shows that the top-ranked female in 2021, on average, would be ranked 536th across all short course yards (25 yards) male events in the country and 326th across all long course meters (50 meters) male events in the country, among USA Swimming members,” USA Swimming released its Athlete Inclusion, Competitive Equity and Eligibility Policy. The policy is intended to “provide a level-playing field for elite cisgender women, and to mitigate the advantages associated with male puberty and physiology.” (USA Swimming Releases Athlete Inclusion, Competitive Equity and Eligibility Policy, available at <https://www.usaswimming.org/news/2022/02/01/usa-swimming-releases-athlete-inclusion-competitive-equity-and-eligibility-policy>.) The policy states:

- For biologically male athletes seeking to compete in the female category in certain “elite” level events, the athlete has the burden of demonstrating to a panel of independent medical experts that:
 - “From a medical perspective, the prior physical development of the athlete as Male, as mitigated by any medical intervention, does not give the athlete a competitive advantage over the athlete’s cisgender Female competitors” and
 - There is a presumption that the athlete is not eligible unless the athlete “demonstrates that the concentration of testosterone in the athlete’s serum has been less than 5 nmol/L . . . continuously for a period of at least thirty-six (36) months before the date of the Application.” This presumption may be rebutted “if the Panel finds, in the unique circumstances of the case, that [the athlete’s prior physical development does not give the athlete a competitive advantage] notwithstanding the athlete’s serum testosterone results (e.g., the athlete has a medical condition

which limits bioavailability of the athlete’s free testosterone).” (USA Swimming Athlete Inclusion Procedures at 43.)

Conclusions

The research and actual observed data show the following:

- At the level of (a) elite, (b) collegiate, (c) scholastic, and (d) recreational competition, men, adolescent boys, or male children, have an advantage over equally gifted, aged and trained women, adolescent girls, or female children in almost all athletic events;
- Biological male physiology is the basis for the performance advantage that men, adolescent boys, or male children have over women, adolescent girls, or female children in almost all athletic events; and
- The administration of androgen inhibitors and cross-sex hormones to men or adolescent boys after the onset of male puberty does not eliminate the performance advantage that men and adolescent boys have over women and adolescent girls in almost all athletic events. Likewise, there is no published scientific evidence that the administration of puberty blockers to males before puberty eliminates the pre-existing athletic advantage that prepubertal males have over prepubertal females in almost all athletic events.

For over a decade sports governing bodies (such as the IOC and NCAA) have wrestled with the question of transgender inclusion in female sports. The previous policies implemented by these sporting bodies had an underlying “premise that reducing testosterone to levels found in biological females is sufficient to remove many of the biologically-based performance advantages.” (World Rugby 2020 at 13.) Disagreements centered around what the appropriate threshold for testosterone levels must be—whether the 10nmol/liter value adopted by the IOC in 2015, or the 5nmol/liter value adopted by the IAAF.

But the science that has become available within just the last few years contradicts that premise. Instead, as the UK Sports Councils, World Rugby, the FIMS Consensus Statement, and the Women’s Sports Policy Working Group have all recognized the science is now sharply “at odds with the accepted intention of current policy in sport, in which twelve months of testosterone suppression is expected to create equivalence between transgender women and females” (UK Sports Literature Review 2021 at 7), and it is now “difficult to suggest that the athletic capabilities of transwomen individuals undergoing HRT or GAS are comparable to those of cisgender women.” (Hamilton, FIMS Consensus Statement 2021.) It is important to note that while the 2021 “IOC Framework on Fairness,

Inclusion, and Non-Discrimination on the Basis of Gender Identity and Sex Variations” calls for an “evidence-based approach,” that Framework does not actually reference *any* of the now extensive scientific evidence relating to the physiological differences between the sexes, and the inefficacy of hormonal intervention to eliminate male advantages relevant to most sports. Instead, the IOC calls on other sporting bodies to define criteria for transgender inclusion, while demanding that such criteria simultaneously ensure fairness, safety, and inclusion for all. The recently updated NCAA policy on transgender participation also relies on other sporting bodies to establish criteria for transgender inclusion while calling for fair competition and safety.

But what we currently know tells us that these policy goals—fairness, safety, and full transgender inclusion—are irreconcilable for many or most sports. Long human experience is now joined by large numbers of research papers that document that males outperform females in muscle strength, muscular endurance, aerobic and anaerobic power output, VO₂max, running speed, swimming speed, vertical jump height, reaction time, and most other measures of physical fitness and physical performance that are essential for athletic success. The male advantages have been observed in fitness testing in children as young as 3 years old, with the male advantages increasing immensely during puberty. To ignore what we know to be true about males’ athletic advantages over females, based on mere hope or speculation that cross sex hormone therapy (puberty blockers, androgen inhibitors, or cross-sex hormones) might neutralize that advantage, when the currently available evidence says it does not, is not science and is not “evidence-based” policy-making.

Because of the recent research and analysis in the general field of transgender athletics, many sports organizations have revised their policies or are in the process of doing so. As a result, there is not any universally recognized policy among sports organizations, and transgender inclusion policies are in a state of flux, likely because of the increasing awareness that the goals of fairness, safety, and full transgender inclusion are irreconcilable.

Sports have been separated by sex for the purposes of safety and fairness for a considerable number of years. The values of safety and fairness are endorsed by numerous sports bodies, including the NCAA and IOC. The existing evidence of durable physiological and performance differences based on biological sex provides a strong evidence-based rationale for keeping rules and policies for such sex-based separation in place (or implementing them as the case may be).

As set forth in detail in this report, there are physiological differences between males and females that result in males having a significant performance advantage over similarly gifted, aged, and trained females in nearly all athletic events before, during, and after puberty. There is not scientific evidence that any

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amount or duration of cross sex hormone therapy (puberty blockers, androgen inhibitors, or cross-sex hormones) eliminates all physiological advantages that result in males performing better than females in nearly all athletic events. Males who have received such therapy retain sufficient male physiological traits that enhance athletic performance vis-à-vis similarly aged females and are thus, from a physiological perspective, more accurately categorized as male and not female.

Bibliography

- Bhargava, A. et al. *Considering Sex as a Biological Variable in Basic and Clinical Studies: An Endocrine Society Scientific Statement*. *Endocr Rev.* 42:219-258 (2021).
- Bohannon, R.W. et al., *Handgrip strength: a comparison of values obtained from the NHANES and NIH toolbox studies*. *Am. J. Occ. Therapy* 73(2) (March/April 2019).
- Catley, M. and G. Tomkinson, *Normative health-related fitness values for children: analysis of 85,437 test results on 9-17-year-old Australians since 1985*. *Br. J. Sports Med.* published online October 21, 2011. bjsm.bmj.com. Additional versions of this article were published by BJSM in 2012 and 2013, including *Br. J. Sports Med.* 47:98-108 (2013).
- Chu, Y. et al., *Biomechanical comparison between elite female and male baseball pitchers*. *J. App. Biomechanics* 25:22-31 (2009).
- Coleman, D.L. and W. Shreve, *Comparing athletic performances: the best elite women to boys and men*. web.law.duke.edu/sites/default/files/centers/sportslaw/comparingathleticperformances.pdf. (Accessed 06/20/21)
- Coleman, D. L. et al., *Re-affirming the value of the sports exception to Title IX's general non-discrimination rule*. *Duke J. of Gender and Law Policy* 27(69):69-134 (2020).
- Davis SM, Kaar JL, Ringham BM, Hockett CW, Glueck DH, and Dabelea D. *Sex differences in infant body composition emerge in the first 5 months of life*. *J Pediatr Endocrinol Metab* 32: 1235-1239 (2019).
- De Miguel-Etayo, P. et al., *Physical fitness reference standards in European children: the IDEFICS study*. *Int. J. Obes (Lond)* 38(2):557-566 (2014).
- Dogan, B., *Multiple-choice reaction and visual perception in female and male elite athletes*. *J. Sports Med. and Physical Fitness* 49:91-96 (2009).
- Dykiert, D. and G. Der, *Sex differences in reaction time mean and intraindividual variability across the life span*. *Developmental Psychology* 48(5): 1262-76 (2012).
- Eiberg, S. et al, *Maximum oxygen uptake and objectively measured physical activity in Danish children 6-7 years of age: the Copenhagen school child intervention study*. *Br J Sports Med* 39:725-30 (2005).

- Fessler, D.M. et al. *Sexual dimorphism in foot length proportionate to stature*. Ann Hum Biol. 32:44-59 (2005).
- Fields J. et al., *Seasonal and Longitudinal Changes in Body Composition by Sport-Position in NCAA Division I Basketball Athletes*. Sports (Basel). 22:6 (2018).
- Gauthier. R. et al. The physical work capacity of Canadian children, aged 7 to 17 in 1983. A comparison with 1968. CAHPER Journal/Revue de l'ACSEPR 50:4–9 (1983).
- Gershoni, M. & Pietrokovski, S. *The landscape of sex-differential transcriptome and its consequent selection in human adults*. BMC BIOL 15: 7 (2017).
- Gooren, L., *The significance of testosterone for fair participation of the female sex in competitive sports*, 13 Asian J. of Andrology 653 (2011).
- Gooren, L., et al., *Transsexuals and competitive sports*. Eur. J. Endocrinol. 151:425-9 (2004).
- Haizlip, K.M. et al., *Sex-based differences in skeletal muscle kinetics and fiber-type composition*. PHYSIOLOGY (BETHESDA) 30: 30–39 (2015).
- Hamilton, B. et al, *Integrating transwomen and female athletes with differences of sex development (DSD) into elite competition: the FIMS 2021 consensus statement*. Sports Med 2021. doi: 10.1007/s40279-021-01451-8.
- Hamilton, B. et al., *Response to the United Nations Human Rights Council's report on race and gender discrimination in sport: an expression of concern and a call to prioritise research*. Sports Med 2020. doi: 10.1007/s40279-020-01380-4.
- Handelsman, D.J. et al., *Circulating testosterone as the hormonal basis of sex differences in athletic performance*. Endocrine Reviews 39(5):803-829 (Oct 2018).
- Handelsman, D.J., *Sex differences in athletic performance emerge coinciding with the onset of male puberty*, 87 Clinical Endocrinology 68 (2017).
- Handelsman, D.J., *"Perspective,"* at <https://www.healio.com/news/endocrinology/20201216/transgender-women-outpace-cisgender-women-in-athletic-tests-after-1-year-on-hormones> (last accessed September 29, 2021).
- Harper, J. et al., *How does hormone transition in transgender women change body composition, muscle strength and haemoglobin? Systematic review with a focus on the implications for sport participation*. Br J Sports Med 55(15):865-872 (2021).

G. Brown

Expert Report, B.P.J. v. WV BOE et al.

Harper, J., *Race time for transgender athletes*. J. Sporting Cultures & Identities 6:1 (2015).

Heydari R, et al. *Y chromosome is moving out of sex determination shadow*. Cell Biosci. 12:4. (2022).

Higerd, G.A. *Assessing the Potential Transgender Impact on Girl Champions in American High School Track and Field*. Doctoral Dissertation United States Sports Academy. (2020).
<https://www.proquest.com/openview/65d34c1e949899aa823beecad873afae/1?pq-origsite=gscholar&cbl=18750&diss=y>

Hilton, E. N. and T.R. Lundberg, *Transgender women in the female category of sport: perspectives on testosterone suppression and performance advantage*. Sports Medicine 51:199-214 (2021).

Hubal, M., H. Gordish-Dressman, P. Thompson, et al., *Variability in muscle size and strength gain after unilateral resistance training*, Med & Sci in Sports & Exercise 964 (2005).

Jain, A. et al., *A comparative study of visual and auditory reaction times on the basis of gender and physical activity levels of medical first year students*. Int J App & Basic Med Res 5:2(124-27) (May-Aug 2015).

Klaver M, et al.. *Early Hormonal Treatment Affects Body Composition and Body Shape in Young Transgender Adolescents*. J Sex Med 15: 251-260 (2018).

Knechtle, B., P. T. Nikolaidis et al., *World single age records in running from 5 km to marathon*, Frontiers in Psych 9(1) (2013).

Knox, T., L.C. Anderson, et al., *Transwomen in elite sport: scientific & ethical considerations*, 45 J. Med Ethics 395 (2019).

Lapauw, B. et al., *Body composition, volumetric and areal bone parameters in male-to-female transsexual persons*. Bone 43:1016-21 (2008).

Latorre-Roman, P. et al., *Reaction times of preschool children on the ruler drop test: a cross-sectional study with reference values*. Perceptual & Motor Skills 125(5):866-78 (2018).

Lepers, R., B. Knechtle et al., *Trends in triathlon performance: effects of sex & age*, 43 Sports Med 851 (2013).

Lesinski, M., A. Schmelcher, et al., *Maturation-, age-, and sex-specific anthropometric and physical fitness percentiles of German elite young athletes*. PLoS One. 15(8):e0237423 (2020).

G. Brown

Expert Report, B.P.J. v. WV BOE et al.

- Levine, B., M. Joyner et al., *The role of testosterone in athletic performance*. Available at https://web.law.duke.edu/sites/default/files/centers/sportslaw/Experts_T_Statement_2019.pdf (January 2019).
- Leyk, D, W. Gorges et al., *Hand-grip strength of young men, women and highly trained female athletes*, Eur J Appl Physiol. 2007 Mar; 99(4):415-21 (2007).
- Lombardo, M. and R. Deaner, *On the evolution of the sex differences in throwing: throwing as a male adaptation in humans*, Quarterly Rev of Biology 93(2):91-119 (2018).
- Malina R.M., Bouchards, C., Bar-Or, O. Growth, Maturation, and Physical Activity (2nd edition). Published by Human Kinetics. 2004.
- McManus, A. and N. Armstrong, *Physiology of elite young female athletes*. J Med & Sport Sci 56:23-46 (2011).
- Millard-Stafford, M. et al., *Nature versus nurture: have performance gaps between men and women reached an asymptote?* Int'l J. Sports Physiol. & Performance 13:530-35 (2018).
- Miller, V.M. *Why are sex and gender important to basic physiology and translational and individualized medicine?* Am J Physiol Heart Circ Physiol 306(6): H781-788, (2014).
- Mormile, M. et al., *The role of gender in neuropsychological assessment in healthy adolescents*. J Sports Rehab 27:16-21 (2018).
- Morris, J. et al., *Sexual dimorphism in human arm power and force: implications for sexual selection on fighting ability*. J Exp Bio 223 (2020).
- National Collegiate Athletic Association, *Inclusion of transgender student-athletes*. https://ncaaorg.s3.amazonaws.com/inclusion/lgbtq/INC_TransgenderHandbook.pdf (August 2011).
- Neder, J.A. et al., *Reference values for concentric knee isokinetic strength and power in nonathletic men and women from 20 to 80 years old*. J. Orth. & Sports Phys. Therapy 29(2):116-126 (1999).
- Pate, R. and A. Kriska, *Physiological basis of the sex difference in cardiorespiratory endurance*. Sports Med 1:87-98 (1984).

G. Brown

Expert Report, B.P.J. v. WV BOE et al.

Poczek, S. et al., *Anthropometric Characteristics and Vertical Jump Abilities by Player Position and Performance Level of Junior Female Volleyball Players*. Int J Environ Res Public Health. 18: 8377-8386 (2021).

Ramírez-Vélez, R. et al., *Vertical Jump and Leg Power Normative Data for Colombian Schoolchildren Aged 9-17.9 Years: The FUPRECOL Study*. J Strength Cond Res. 31: 990-998 (2017).

Roberts, S.A., J.M. Carswell. *Growth, growth potential, and influences on adult height in the transgender and gender-diverse population*. Andrology. 9:1679-1688 (2021).

Roberts, T.A. et al., *Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organisations and legislators*. Br J Sports Med published online at [10.1136/bjsports-2020-102329](https://doi.org/10.1136/bjsports-2020-102329) (Dec. 7, 2020).

Roser, M., Cameron Appel and Hannah Ritchie (2013) "Human Height". Published online at OurWorldInData.org. Retrieved from: <https://ourworldindata.org/human-height> [Online Resource]

Ross, J.G. and G.G. Gilbert. *National Children and Youth Fitness Study*. J Physical Educ Rec Dance (JOPERD) 56: 45 – 50 (1985).

Sakamoto, K. et al., *Comparison of kicking speed between female and male soccer players*. Procedia Eng 72:50-55 (2014).

Santos, R. et al. *Physical fitness percentiles for Portuguese children and adolescents aged 10-18 years*. J Sports Sci. 32:1510-8. (2014).

Sattler, T. et al., *Vertical jump performance of professional male and female volleyball players: effects of playing position and competition level*. J Strength & Cond Res 29(6):1486-93 (2015).

Sax L. *How common is intersex? a response to Anne Fausto-Sterling*. J Sex Res. 39(3):174-8 (2002).

Scharff, M. et al., *Change in grip strength in trans people and its association with lean body mass and bone density*. Endocrine Connections 8:1020-28 (2019).

Senefeld, J.W., et al. *Divergence in timing and magnitude of testosterone levels between male and female youths*, JAMA 324(1):99-101 (2020).

Shah, K. et al. *Do you know the sex of your cells?* Am J Physiol Cell Physiol. 306(1):C3-18 (2014).

- Silverman, I., *The secular trend for grip strength in Canada and the United States*, J Sports Sci 29(6):599-606 (2011).
- Spierer, D. et al., *Gender influence on response time to sensory stimuli*. J Strength & Cond Res 24:4(957-63) (2010).
- Staiano AE, Katzmarzyk PT. *Ethnic and sex differences in body fat and visceral and subcutaneous adiposity in children and adolescents*. Int J Obes (Lond). 36:1261-9. (2012).
- Tack, L.J.W. et al., *Proandrogenic and antiandrogenic progestins in transgender youth: differential effects on body composition and bone metabolism*. J. Clin. Endocrinol. Metab, 103(6):2147-56 (2018).
- Tambalis, K. et al., *Physical fitness normative values for 6-18-year-old Greek boys and girls, using the empirical distribution and the lambda, mu, and sigma statistical method*. Eur J Sports Sci 16:6(736-46) (2016).
- Taylor, M.J. et al., *Vertical jumping and leg power normative data for English school children aged 10-15 years*. J Sports Sci. 28:867-72. (2010).
- Taylor RW, Gold E, Manning P, and Goulding A. *Gender differences in body fat content are present well before puberty*. Int J Obes Relat Metab Disord 21: 1082-1084, 1997.
- Taylor RW, Grant AM, Williams SM, and Goulding A. *Sex differences in regional body fat distribution from pre- to postpuberty*. Obesity (Silver Spring) 18: 1410-1416, 2010.
- Thibault, V., M. Guillaume et al., *Women and men in sport performance: the gender gap has not evolved since 1983*. J Sports Science & Med 9:214-223 (2010).
- Thomas, J.R. and K. E. French, *Gender differences across age in motor performance: a meta-analysis*. Psych. Bull. 98(2):260-282 (1985).
- Tomkinson, G. et al., *European normative values for physical fitness in children and adolescents aged 9-17 years: results from 2,779,165 Eurofit performances representing 30 countries*. Br J Sports Med 52:1445-56 (2018).
- Tomkinson, G. et al., *International normative 20 m shuttle run values from 1,142,026 children and youth representing 50 countries*. Br J Sports Med. 51:1545-1554 (2017).

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Tønnessen, E., I. S. Svendsen et al., *Performance development in adolescent track & field athletes according to age, sex, and sport discipline*. PLOS ONE 10(6): e0129014 (2015).

Tønnessen, E. et al., *Reaction time aspects of elite sprinters in athletic world championships*. J Strength & Cond Res 27(4):885-92 (2013).

United Kingdom Sports Councils, *Guidance for transgender inclusion in domestic sport*. Available at [https://equalityinsport.org/docs/300921/Guidance for Transgender Inclusion in Domestic Sport 2021 - Summary of Background Documents.pdf](https://equalityinsport.org/docs/300921/Guidance%20for%20Transgender%20Inclusion%20in%20Domestic%20Sport%202021%20-%20Summary%20of%20Background%20Documents.pdf). September 2021.

United Kingdom Sports Councils, *International Research Literature Review*. Available at <https://equalityinsport.org/docs/300921/Transgender%20International%20Research%20Literature%20Review%202021.pdf>. September 2021.

USA Swimming Athlete Inclusion Procedures, last revision February 1, 2022, available at https://www.usaswimming.org/docs/default-source/governance/governance-lsc-website/rules_policies/usa-swimming-policy-19.pdf.

VanCaenegem, E. et al, *Preservation of volumetric bone density and geometry in trans women during cross-sex hormonal therapy: a prospective observational study*. Osteoporos Int 26:35-47 (2015).

Wiik, A., T. R Lundberg et al., *Muscle strength, size, and composition following 12 months of gender-affirming treatment in transgender individuals*. J. Clinical Endocrin. & Metab. 105(3):e805-813 (2020).

Women's Sports Policy Working Group, *Briefing book: a request to Congress and the administration to preserve girls' and women's sport and accommodate transgender athletes*. Available at womenssportspolicy.org. (2021).

World Rugby Transgender Guidelines. <https://www.world.rugby/the-game/player-welfare/guidelines/transgender> (2020).

World Rugby Transgender Women's Guidelines. <https://www.world.rugby/the-game/player-welfare/guidelines/transgender/women> (2020).

Wunderlich RE, Cavanagh PR. *Gender differences in adult foot shape: implications for shoe design*. Med Sci Sports Exerc. 33:605-1 (2001).

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Appendix 1 – Data Tables**Presidential Physical Fitness Results¹⁴****Curl-Ups (# in 1 minute)**

Age	Male		Female		Age	Male-Female % Difference	
	50th %ile	85th %ile	50th %ile	85th %ile		50th %ile	85th %ile
6	22	33	23	32	6	-4.3%	3.1%
7	28	36	25	34	7	12.0%	5.9%
8	31	40	29	38	8	6.9%	5.3%
9	32	41	30	39	9	6.7%	5.1%
10	35	45	30	40	10	16.7%	12.5%
11	37	47	32	42	11	15.6%	11.9%
12	40	50	35	45	12	14.3%	11.1%
13	42	53	37	46	13	13.5%	15.2%
14	45	56	37	47	14	21.6%	19.1%
15	45	57	36	48	15	25.0%	18.8%
16	45	56	35	45	16	28.6%	24.4%
17	44	55	34	44	17	29.4%	25.0%

¹⁴ This data is available from a variety of sources, including:
<https://gilmore.gvsd.us/documents/Info/Forms/Teacher%20Forms/Presidentialchallenge-test.pdf>

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Shuttle Run (seconds)

Age	Male		Female		Age	Male-Female % Difference	
	50th %ile	85th %ile	50th %ile	85th %ile		50th %ile	85th %ile
6	13.3	12.1	13.8	12.4	6	3.6%	2.4%
7	12.8	11.5	13.2	12.1	7	3.0%	5.0%
8	12.2	11.1	12.9	11.8	8	5.4%	5.9%
9	11.9	10.9	12.5	11.1	9	4.8%	1.8%
10	11.5	10.3	12.1	10.8	10	5.0%	4.6%
11	11.1	10	11.5	10.5	11	3.5%	4.8%
12	10.6	9.8	11.3	10.4	12	6.2%	5.8%
13	10.2	9.5	11.1	10.2	13	8.1%	6.9%
14	9.9	9.1	11.2	10.1	14	11.6%	9.9%
15	9.7	9.0	11.0	10.0	15	11.8%	10.0%
16	9.4	8.7	10.9	10.1	16	13.8%	13.9%
17	9.4	8.7	11.0	10.0	17	14.5%	13.0%

1 mile run (seconds)

Age	Male		Female		Age	Male-Female % Difference	
	50th %ile	85th %ile	50th %ile	85th %ile		50th %ile	85th %ile
6	756	615	792	680	6	4.5%	9.6%
7	700	562	776	636	7	9.8%	11.6%
8	665	528	750	602	8	11.3%	12.3%
9	630	511	712	570	9	11.5%	10.4%
10	588	477	682	559	10	13.8%	14.7%
11	560	452	677	542	11	17.3%	16.6%
12	520	431	665	503	12	21.8%	14.3%
13	486	410	623	493	13	22.0%	16.8%
14	464	386	606	479	14	23.4%	19.4%
15	450	380	598	488	15	24.7%	22.1%
16	430	368	631	503	16	31.9%	26.8%
17	424	366	622	495	17	31.8%	26.1%

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Pull Ups (# completed)

Age	Male		Female		Age	Male-Female % Difference	
	50th %ile	85th %ile	50th %ile	85th %ile		50th %ile	85th %ile
6	1	2	1	2	6	0.0%	0.0%
7	1	4	1	2	7	0.0%	100.0%
8	1	5	1	2	8	0.0%	150.0%
9	2	5	1	2	9	100.0%	150.0%
10	2	6	1	3	10	100.0%	100.0%
11	2	6	1	3	11	100.0%	100.0%
12	2	7	1	2	12	100.0%	250.0%
13	3	7	1	2	13	200.0%	250.0%
14	5	10	1	2	14	400.0%	400.0%
15	6	11	1	2	15	500.0%	450.0%
16	7	11	1	1	16	600.0%	1000.0%
17	8	13	1	1	17	700.0%	1200.0%

Data Compiled from Athletic.Net

2021 National 3000 m cross country race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls	Difference	Boys	Girls	Difference	Boys	Girls	Difference
1	691.8	728.4		607.7	659.8		608.1	632.6	
2	722.5	739.0	#1 boy vs #	619.6	674.0	#1 boy vs #	608.7	639.8	#1 boy vs #
3	740.5	783.0	1 girl	620.1	674.7	1 girl	611.3	664.1	1 girl
4	759.3	783.5	5.0%	643.2	683.7	7.9%	618.6	664.4	3.9%
5	759.6	792.8		646.8	685.0		619.7	671.6	
6	760.0	824.1		648.0	686.4		631.2	672.1	
7	772.0	825.7	Average	648.8	687.0	Average	631.7	672.3	Average
8	773.0	832.3	difference	658.0	691.0	difference	634.9	678.4	difference
9	780.7	834.3	boys vs girls	659.5	692.2	boys vs girls	635.0	679.3	boys vs girls
10	735.1	844.4	6.2%	663.9	663.3	5.6%	635.1	679.4	6.3%

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2021 National 3000 m cross country race time in seconds

Rank	5 th grade			6 th grade			7 th grade		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	625.5	667.0	Difference	545.3	582.0	Difference	534.0	560.7	Difference
2	648.8	685.0	#1 boy vs #	553.2	584.3	#1 boy vs #	541.0	567.0	#1 boy vs #
3	653.5	712.9	1 girl	562.3	585.1	1 girl	542.6	581.8	1 girl
4	658.4	719.2	6.2%	562.9	599.8	6.3%	544.6	583.0	4.8%
5	675.3	725.2		571.5	612.9		546.0	595.0	
6	677.4	727.7		588.0	622.0		556.0	599.0	
7	677.6	734.0	Average	591.3	624.9	Average	556.0	604.3	Average
8	679.1	739.4	difference	593.0	626.0	difference	556.0	606.0	difference
9	686.4	739.4	boys vs girls	593.8	628.0	boys vs girls	558.6	606.8	boys vs girls
10	686.4	746.4	7.3%	594.1	645.6	5.8%	563.2	617.0	7.1%

2021 National 100 m Track race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	13.06	14.24	Difference #1	10.87	12.10	Difference #1	11.37	12.08	Difference #1
2	13.54	14.41	boy vs # 1	10.91	12.24	boy vs # 1	11.61	12.43	boy vs # 1
3	13.73	14.44	girl	11.09	12.63	girl	11.73	12.51	girl
4	14.10	14.48	8.3%	11.25	12.70	10.2%	11.84	12.55	5.9%
5	14.19	14.49		11.27	12.75		11.89	12.57	
6	14.31	14.58		11.33	12.80		11.91	12.62	
7	14.34	14.69	Average	11.42	12.83	Average	11.94	12.65	Average
8	14.35	14.72	difference	11.43	12.84	difference	11.97	12.71	difference
9	14.41	14.77	boys vs girls	11.44	12.88	boys vs girls	12.08	12.71	boys vs girls
10	14.43	14.86	3.6%	11.51	12.91	11.1%	12.12	12.75	5.7%

2021 National 200 m Track race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	24.02	28.72	Difference #1	21.77	25.36	Difference #1	20.66	25.03	Difference #1
2	24.03	28.87	boy vs # 1	22.25	25.50	boy vs # 1	22.91	25.18	boy vs # 1
3	28.07	29.92	girl	22.48	25.55	girl	23.14	25.22	girl
4	28.44	29.95	16.4%	22.57	25.70	14.2%	23.69	25.49	17.5%
5	28.97	30.04		22.65	26.08		23.84	25.78	
6	29.26	30.09		22.77	26.22		24.23	25.89	
7	29.34	30.27	Average	23.11	26.79	Average	24.35	26.03	Average
8	29.38	30.34	difference	23.16	26.84	difference	24.58	26.07	difference
9	29.65	30.41	boys vs girls	23.28	26.91	boys vs girls	24.59	26.10	boys vs girls
10	29.78	30.54	6.1%	23.47	26.85	13.1%	24.61	26.13	7.9%

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2021 National 400 m Track race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	66.30	67.12	Difference #1	49.29	56.80	Difference #1	51.96	55.70	Difference #1
2	66.88	67.67	boy vs # 1	50.47	58.57	boy vs # 1	55.52	57.08	boy vs # 1
3	67.59	67.74	girl	52.28	60.65	girl	55.58	57.60	girl
4	68.16	68.26	1.2%	52.44	61.45	13.2%	55.59	57.79	6.7%
5	68.51	68.37		53.31	61.81		55.72	58.02	
6	69.13	71.02		53.65	62.03		55.84	58.25	
7	69.75	72.73	Average	53.78	62.32	Average	55.92	59.25	Average
8	69.80	73.25	difference	54.51	62.33	difference	57.12	59.27	difference
9	69.81	73.31	boys vs girls	55.84	62.34	boys vs girls	57.18	59.40	boys vs girls
10	70.32	73.48	2.4%	55.90	62.40	13.0%	57.22	59.49	4.2%

2021 National 800 m Track race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	152.2	157.9	Difference #1	120.8	141.4	Difference #1	127.8	138.5	Difference #1
2	155.2	164.6	boy vs # 1	124.0	142.2	boy vs # 1	129.7	143.1	boy vs # 1
3	161.0	164.9	girl	125.1	148.8	girl	130.5	144.2	girl
4	161.1	165.9	3.6%	125.6	151.3	14.5%	133.2	144.2	7.7%
5	161.2	168.5		126.5	151.6		136.2	144.9	
6	161.6	169.9		136.5	152.5		136.5	145.0	
7	161.8	171.5	Average	137.1	153.1	Average	136.7	145.2	Average
8	162.2	173.1	difference	138.5	153.7	difference	136.7	145.6	difference
9	165.3	173.4	boys vs girls	139.5	153.8	boys vs girls	137.0	145.6	boys vs girls
10	166.9	174.7	4.5%	140.2	154.2	12.6%	137.9	145.8	6.9%

2021 National 1600 m Track race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	372.4	397.6	Difference #1	307.4	319.3	Difference #1	297.3	313.8	Difference #1
2	378.3	400.9	boy vs # 1	313.7	322.2	boy vs # 1	298.4	317.1	boy vs # 1
3	378.4	405.6	girl	315.0	322.6	girl	307.0	319.9	girl
4	402.0	435.2	6.3%	318.2	337.5	3.7%	313.9	323.3	5.2%
5	406.4	445.0		318.4	345.2		319.2	325.3	
6	413.4	457.0		320.5	345.7		320.4	326.2	
7	457.4	466.0	Average	327.0	345.9	Average	321.1	327.0	Average
8	473.3	466.8	difference	330.3	347.1	difference	321.9	330.0	difference
9	498.3	492.3	boys vs girls	333.4	347.5	boys vs girls	325.5	331.1	boys vs girls
10	505.0	495.0	4.0%	347.0	355.6	4.7%	327.1	332.5	2.9%

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2021 National 3000 m Track race time in seconds

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	794.2	859.9	Difference #1	602.3	679.2	Difference #1	556.6	623.7	Difference #1
2	856.3		boy vs # 1	644.9	709.7	boy vs # 1	591.6	649.5	boy vs # 1
3			girl	646.6	714.2	girl	600.8	651.6	girl
4			7.6%	648.2	741.9	11.3%	607.1	654.9	10.8%
5		No		648.4	742.7		609.1	662.9	
6	No	Further		652.8	756.6		611.5	664.1	
7	further	Data	Average	658.9	760.2	Average	615.7	666.3	Average
8	data		difference	660.1	762.5	difference	617.3	666.8	difference
9			boys vs girls	662.7	780.2	boys vs girls	618.4	673.2	boys vs girls
10			NA%	671.6	792.3	12.7%	620.6	674.4	8.2%

2021 National Long Jump Distance (in inches)

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	156.0	176.0	Difference #1	256.8	213.8	Difference #1	224.0	201.3	Difference #1
2	156.0	163.8	boy vs # 1	247.0	212.0	boy vs # 1	222.5	197.3	boy vs # 1
3	155.0	153.0	girl	241.0	210.8	girl	220.5	195.8	girl
4	154.3	152.0	-11.4%	236.3	208.8	20.1%	210.3	193.5	11.3%
5	154.0	149.5		231.5	207.0		210.0	193.3	
6	152.8	146.0		225.0	204.8		206.8	192.5	
7	151.5	144.5	Average	224.0	194.5	Average	206.0	192.3	Average
8	150.8	137.5	difference	224.0	192.5	difference	205.5	192.0	difference
9	150.5	137.0	boys vs girls	221.8	192.3	boys vs girls	205.0	191.3	boys vs girls
10		No	1.4%			13.2%			9.1%
	150.5	Further		219.0	187.5		204.5	189.0	
		Data							

2021 National High Jump Distance (in inches)

Rank	7-8 years old			9-10 years old			11-12 year old		
	Boys	Girls		Boys	Girls		Boys	Girls	
1	38.0	37.5	Difference #1	72.0	58.0	Difference #1	63.0	56.0	Difference #1
2	38.0	34.0	boy vs # 1	70.0	58.0	boy vs # 1	61.0	56.0	boy vs # 1
3	36.0	32.0	girl	65.8	57.0	girl	60.0	57.0	girl
4	36.0	32.0	1.3	62.0	56.0	24.1%	59.0	56.0	12.5%
5	35.8	32.0		62.0	56.0		59.0	56.0	
6	35.5			62.0	55.0		59.0	55.0	
7	34.0	No	Average	61.0	54.0	Average	59.0	54.0	Average
8	32.0	further	difference	60.0	54.0	difference	58.0	54.0	difference
9	59.0	Data	boys vs girls	59.0	No	boys vs girls	57.8	56.0	boys vs girls
10			21.6%		Further	12.5%			6.9%
	56.0			56.0	Data		57.8	56.0	

Appendix 2 – Scholarly Publications in Past 10 Years

Refereed Publications

1. Brown GA, Shaw BS, Shaw I. How much water is in a mouthful, and how many mouthfuls should I drink? A laboratory exercise to help students understand developing a hydration plan. *Adv Physiol Educ* 45: 589–593, 2021.
2. Schneider KM and Brown GA (as Faculty Mentor). What's at Stake: Is it a Vampire or a Virus? *International Journal of Undergraduate Research and Creative Activities*. 11, Article 4. 2019.
3. Christner C and Brown GA (as Faculty Mentor). Explaining the Vampire Legend through Disease. *UNK Undergraduate Research Journal*. 23(1), 2019. (*This is an on-campus publication.)
4. Schneekloth B and Brown GA. Comparison of Physical Activity during Zumba with a Human or Video Game Instructor. 11(4):1019-1030. *International Journal of Exercise Science*, 2018.
5. Bice MR, Hollman A, Bickford S, Bickford N, Ball JW, Wiedenman EM, Brown GA, Dinkel D, and Adkins M. Kinesiology in 360 Degrees. *International Journal of Kinesiology in Higher Education*, 1: 9-17, 2017
6. Shaw I, Shaw BS, Brown GA, and Shariat A. Review of the Role of Resistance Training and Musculoskeletal Injury Prevention and Rehabilitation. *Gavin Journal of Orthopedic Research and Therapy*. 1: 5-9, 2016
7. Kahle A, Brown GA, Shaw I, & Shaw BS. Mechanical and Physiological Analysis of Minimalist versus Traditionally Shod Running. *J Sports Med Phys Fitness*. 56(9):974-9, 2016
8. Bice MR, Carey J, Brown GA, Adkins M, and Ball JW. The Use of Mobile Applications to Enhance Learning of the Skeletal System in Introductory Anatomy & Physiology Students. *Int J Kines Higher Educ* 27(1) 16-22, 2016
9. Shaw BS, Shaw I, & Brown GA. Resistance Exercise is Medicine. *Int J Ther Rehab*. 22: 233-237, 2015.
10. Brown GA, Bice MR, Shaw BS, & Shaw I. Online Quizzes Promote Inconsistent Improvements on In-Class Test Performance in Introductory Anatomy & Physiology. *Adv. Physiol. Educ*. 39: 63-6, 2015
11. Brown GA, Heiserman K, Shaw BS, & Shaw I. Rectus abdominis and rectus femoris muscle activity while performing conventional unweighted and weighted seated abdominal trunk curls. *Medicina dello Sport*. 68: 9-18. 2015
12. Botha DM, Shaw BS, Shaw I & Brown GA. Role of hyperbaric oxygen therapy in the promotion of cardiopulmonary health and rehabilitation. *African Journal for*

- Physical, Health Education, Recreation and Dance (AJPHERD). Supplement 2 (September), 20: 62-73, 2014
13. Abbey BA, Heelan KA, Brown, GA, & Bartee RT. Validity of HydraTrend™ Reagent Strips for the Assessment of Hydration Status. *J Strength Cond Res.* 28: 2634-9. 2014
 14. Scheer KC, Siebrandt SM, Brown GA, Shaw BS, & Shaw I. Wii, Kinect, & Move. Heart Rate, Oxygen Consumption, Energy Expenditure, and Ventilation due to Different Physically Active Video Game Systems in College Students. *International Journal of Exercise Science:* 7: 22-32, 2014
 15. Shaw BS, Shaw I, & Brown GA. Effect of concurrent aerobic and resistive breathing training on respiratory muscle length and spirometry in asthmatics. *African Journal for Physical, Health Education, Recreation and Dance (AJPHERD). Supplement 1 (November),* 170-183, 2013
 16. Adkins M, Brown GA, Heelan K, Ansorge C, Shaw BS & Shaw I. Can dance exergaming contribute to improving physical activity levels in elementary school children? *African Journal for Physical, Health Education, Recreation and Dance (AJPHERD).* 19: 576-585, 2013
 17. Jarvi MB, Brown GA, Shaw BS & Shaw I. Measurements of Heart Rate and Accelerometry to Determine the Physical Activity Level in Boys Playing Paintball. *International Journal of Exercise Science:* 6: 199-207, 2013
 18. Brown GA, Krueger RD, Cook CM, Heelan KA, Shaw BS & Shaw I. A prediction equation for the estimation of cardiorespiratory fitness using an elliptical motion trainer. *West Indian Medical Journal.* 61: 114-117, 2013.
 19. Shaw BS, Shaw I, & Brown GA. Body composition variation following diaphragmatic breathing. *African Journal for Physical, Health Education, Recreation and Dance (AJPHERD).* 18: 787-794, 2012.

Refereed Presentations

1. Brown GA. Transwomen competing in women's sports: What we know, and what we don't. American Physiological Society New Trends in Sex and Gender Medicine conference. Held virtually due to Covid-19 pandemic. October 19 - 22, 2021, 2021.
2. Shaw BS, Boshoff VE, Coetzee S, Brown GA, Shaw I. A Home-based Resistance Training Intervention Strategy To Decrease Cardiovascular Disease Risk In Overweight Children *Med Sci Sport Exerc.* 53(5), 742. 68th Annual Meeting of the American College of Sports Medicine. Held virtually due to Covid-19 pandemic. June 1-5, 2021.
3. Shaw I, Cronje M, Brown GA, Shaw BS. Exercise Effects On Cognitive Function And Quality Of Life In Alzheimer's Patients In Long-term Care. *Med*

- Sci Sport Exerc. 53(5), 743. 68th Annual Meeting of the American College of Sports Medicine. Held virtually due to Covid-19 pandemic. June 1-5, 2021.
4. Brown GA, Escalera M, Oleena A, Turek T, Shaw I, Shaw BS. Relationships between Body Composition, Abdominal Muscle Strength, and Well Defined Abdominal Muscles. Med Sci Sport Exerc. 53(5), 197. 68th Annual Meeting of the American College of Sports Medicine. Held virtually due to Covid-19 pandemic. June 1-5, 2021.
 5. Brown GA, Jackson B, Szekely B, Schramm T, Shaw BS, Shaw I. A Pre-Workout Supplement Does Not Improve 400 M Sprint Running or Bicycle Wingate Test Performance in Recreationally Trained Individuals. Med Sci Sport Exerc. 50(5), 2932. 65th Annual Meeting of the American College of Sports Medicine. Minneapolis, MN. June 2018.
 6. Paulsen SM, Brown GA. Neither Coffee Nor A Stimulant Containing “Pre-workout” Drink Alter Cardiovascular Drift During Walking In Young Men. Med Sci Sport Exerc. 50(5), 2409. 65th Annual Meeting of the American College of Sports Medicine. Minneapolis, MN. June 2018.
 7. Adkins M, Bice M, Bickford N, Brown GA. Farm to Fresh! A Multidisciplinary Approach to Teaching Health and Physical Activity. 2018 spring SHAPE America central district conference. Sioux Falls, SD. January 2018.
 8. Shaw I, Kinsey JE, Richards R, Shaw BS, and Brown GA. Effect Of Resistance Training During Nebulization In Adults With Cystic Fibrosis. International Journal of Arts & Sciences’ (IJAS). International Conference for Physical, Life and Health Sciences which will be held at FHWien University of Applied Sciences of WKW, at Währinger Gürtel 97, Vienna, Austria, from 25-29 June 2017.
 9. Bongers M, Abbey BM, Heelan K, Steele JE, Brown GA. Nutrition Education Improves Nutrition Knowledge, Not Dietary Habits In Female Collegiate Distance Runners. Med Sci Sport Exerc. 49(5), 389. 64th Annual Meeting of the American College of Sports Medicine. Denver, CO. May 2017.
 10. Brown GA, Steele JE, Shaw I, Shaw BS. Using Elisa to Enhance the Biochemistry Laboratory Experience for Exercise Science Students. Med Sci Sport Exerc. 49(5), 1108. 64th Annual Meeting of the American College of Sports Medicine. Denver, CO. May 2017.
 11. Brown GA, Shaw BS, and Shaw I. Effects of a 6 Week Conditioning Program on Jumping, Sprinting, and Agility Performance In Youth. Med Sci Sport Exerc. 48(5), 3730. 63rd Annual Meeting of the American College of Sports Medicine. Boston, MA. June 2016.
 12. Shaw I, Shaw BS, Boshoff VE, Coetzee S, and Brown GA. Kinanthropometric Responses To Callisthenic Strength Training In Children. Med Sci Sport Exerc.

- 48(5), 3221. 63rd Annual Meeting of the American College of Sports Medicine. Boston, MA. June 2016.
13. Shaw BS, Shaw I, Gouveia M, McIntyre S, and Brown GA. Kinanthropometric Responses To Moderate-intensity Resistance Training In Postmenopausal Women. *Med Sci Sport Exerc.* 48(5), 2127. 63rd Annual Meeting of the American College of Sports Medicine. Boston, MA. June 2016.
 14. Bice MR, Cary JD, Brown GA, Adkins M, and Ball JW. The use of mobile applications to enhance introductory anatomy & physiology student performance on topic specific in-class tests. National Association for Kinesiology in Higher Education National Conference. January 8, 2016.
 15. Shaw I, Shaw BS, Lawrence KE, Brown GA, and Shariat A. Concurrent Resistance and Aerobic Exercise Training Improves Hemodynamics in Normotensive Overweight and Obese Individuals. *Med Sci Sport Exerc.* 47(5), 559. 62nd Annual Meeting of the American College of Sports Medicine. San Diego, CA. May 2015.
 16. Shaw BS, Shaw I, McCrorie C, Turner S., Schnetler A, and Brown GA. Concurrent Resistance and Aerobic Training in the Prevention of Overweight and Obesity in Young Adults. *Med Sci Sport Exerc.* 47(5), 223. 62nd Annual Meeting of the American College of Sports Medicine. San Diego, CA. May 2015.
 17. Schneekloth B, Shaw I, Shaw BS, and Brown GA. Physical Activity Levels Using Kinect™ Zumba Fitness versus Zumba Fitness with a Human Instructor. *Med Sci Sport Exerc.* 46(5), 326. 61st Annual Meeting of the American College of Sports Medicine. Orlando, FL. June 2014.
 18. Shaw I, Lawrence KE, Shaw BS, and Brown GA. Callisthenic Exercise-related Changes in Body Composition in Overweight and Obese Adults. *Med Sci Sport Exerc.* 46(5), 394. 61st Annual Meeting of the American College of Sports Medicine. Orlando, FL June 2014.
 19. Shaw BS, Shaw I, Fourie M, Gildenhuis M, and Brown GA. Variances In The Body Composition Of Elderly Woman Following Progressive Mat Pilates. *Med Sci Sport Exerc.* 46(5), 558. 61st Annual Meeting of the American College of Sports Medicine. Orlando, FL June 2014.
 20. Brown GA, Shaw I, Shaw BS, and Bice M. Online Quizzes Enhance Introductory Anatomy & Physiology Performance on Subsequent Tests, But Not Examinations. *Med Sci Sport Exerc.* 46(5), 1655. 61st Annual Meeting of the American College of Sports Medicine. Orlando, FL June 2014.
 21. Kahle, A. and Brown, G.A. Electromyography in the Gastrocnemius and Tibialis Anterior, and Oxygen Consumption, Ventilation, and Heart Rate During Minimalist versus Traditionally Shod Running. 27th National Conference on Undergraduate Research (NCUR). La Crosse, Wisconsin USA. April 11-13, 2013

22. Shaw, I., Shaw, B.S., and Brown, G.A. Resistive Breathing Effects on Pulmonary Function, Aerobic Capacity and Medication Usage in Adult Asthmatics *Med Sci Sports Exerc* 45 (5). S1602 2013. 60th Annual Meeting of the American College of Sports Medicine, Indianapolis, IN USA, May 26-30 2013
23. Shaw, B.S. Gildenhuis, G.A., Fourie, M. Shaw I, and Brown, G.A. Function Changes In The Aged Following Pilates Exercise Training. *Med Sci Sports Exerc* 45 (5). S1566 60th Annual Meeting of the American College of Sports Medicine, Indianapolis, IN USA, May 26-30 2013
24. Brown, G.A., Abbey, B.M., Ray, M.W., Shaw B.S., & Shaw, I. Changes in Plasma Free Testosterone and Cortisol Concentrations During Plyometric Depth Jumps. *Med Sci Sports Exerc* 44 (5). S598, 2012. 59th Annual Meeting of the American College of Sports Medicine. May 29 - June 2, 2012; San Francisco, California
25. Shaw, I., Fourie, M., Gildenhuis, G.M., Shaw B.S., & Brown, G.A. Group Pilates Program and Muscular Strength and Endurance Among Elderly Woman. *Med Sci Sports Exerc* 44 (5). S1426. 59th Annual Meeting of the American College of Sports Medicine. May 29 - June 2, 2012; San Francisco, California
26. Shaw B.S., Shaw, I., & Brown, G.A. Concurrent Inspiratory-Expiratory and Aerobic Training Effects On Respiratory Muscle Strength In Asthmatics. *Med Sci Sports Exerc* 44 (5). S2163. 59th Annual Meeting of the American College of Sports Medicine. May 29 - June 2, 2012; San Francisco, California
27. Scheer, K., Siebrandt, S., Brown, G.A, Shaw B.S., & Shaw, I. Heart Rate, Oxygen Consumption, and Ventilation due to Different Physically Active Video Game Systems. *Med Sci Sports Exerc* 44 (5). S1763. 59th Annual Meeting of the American College of Sports Medicine. May 29 - June 2, 2012; San Francisco, California
28. Jarvi M.B., Shaw B.S., Shaw, I., & Brown, G.A. (2012) Paintball Is A Blast, But Is It Exercise? Heart Rate and Accelerometry In Boys Playing Paintball. *Med Sci Sports Exerc* 44 (5). S3503. 59th Annual Meeting of the American College of Sports Medicine. May 29 - June 2, 2012; San Francisco, California

Book Chapters

1. Shaw BS, Shaw I, Brown G.A. Importance of resistance training in the management of cardiovascular disease risk. In *Cardiovascular Risk Factors*. IntechOpen, 2021.

G. Brown

Expert Report, B.P.J. v. WV BOE et al.

2. Brown, G.A. Chapters on Androstenedione and DHEA. In: Nutritional Supplements in Sport, Exercise and Health an A-Z Guide. edited by Linda M. Castell, Samantha J. Stear, Louise M. Burke. Routledge 2015.

Refereed Web Content

1. Brown GA. Looking back and moving forward. The importance of reflective assessment in physiology education. (January 13, 2022)
<https://blog.lifescitrc.org/pecop/2022/01/13/looking-back-and-moving-forward-the-importance-of-reflective-assessment-in-physiology-education/>
2. Brown GA. The Olympics, sex, and gender in the physiology classroom. Physiology Educators Community of Practice, managed by the Education group of the American Physiological Society (August 18, 2021)
<https://blog.lifescitrc.org/pecop/2021/08/18/the-olympics-sex-and-gender-in-the-physiology-classroom/>

A complete CV is available at

https://www.unk.edu/academics/hperls/bio_pages/current-vita-gab.pdf

Exhibit 30

1 IN THE UNITED STATES DISTRICT COURT
2 FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
3 CHARLESTON DIVISION
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)
6 B.P.J. by her next friend and)
mother, HEATHER JACKSON,)
7)
Plaintiff,)
8) No. 2:21-cv-00316
vs.)
9)
WEST VIRGINIA STATE BOARD OF)
10 EDUCATION, HARRISON COUNTY)
BOARD OF EDUCATION, WEST)
11 VIRGINIA SECONDARY SCHOOL)
ACTIVITIES COMMISSION, W.)
12 CLAYTON BURCH in his official)
capacity as State)
13 Superintendent, DORA STUTLER,)
in her official capacity as)
14 Harrison County)
Superintendent, and THE STATE)
15 OF WEST VIRGINIA,)
)
16 Defendants.)
)
17 And)
)
18 LAINEY ARMISTEAD,)
)
19 Defendant-Intervenor.)

20 REMOTE VIDEOTAPED DEPOSITION OF
21 GREGORY BROWN, Ph.D.
22 Friday, March 25, 2022
23 Volume I

23 Reported by:
24 ALEXIS KAGAY
25 CSR No. 13795
Job No. 5122856
PAGES 1 - 282

1 IN THE UNITED STATES DISTRICT COURT
2 FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA CHARLESTON
3 DIVISION
4

5 _____
6 B.P.J. by her next friend and)
mother, HEATHER JACKSON,)

7 Plaintiff,)

8 vs.) No. 2:21-cv-00316

9 WEST VIRGINIA STATE BOARD OF)
EDUCATION, HARRISON COUNTY)
10 BOARD OF EDUCATION, WEST)
VIRGINIA SECONDARY SCHOOL)
11 ACTIVITIES COMMISSION, W.)
CLAYTON BURCH in his official)
12 capacity as State)
Superintendent, DORA STUTLER,)
13 in her official capacity as)
Harrison County)
14 Superintendent, and THE STATE)
OF WEST VIRGINIA,)

15)
16 Defendants.)

17 And)

18 LAINEY ARMISTEAD,)

19 Defendant-Intervenor.)
_____)

20 Videotaped deposition of GREGORY BROWN, Ph.D.,
21 Volume I, taken on behalf of Plaintiff, with all
22 participants appearing remotely, beginning at 7:02 a.m.
23 and ending at 4:03 p.m. on Friday, March 25, 2022,
24 before ALEXIS KAGAY, Certified Shorthand Reporter
25 No. 13795.

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WITNESS EXAMINATION
GREGORY BROWN, Ph.D.
Volume I

BY MR. BLOCK 16

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haemoglobin? Systematic review
with a focus on the implications
for sport participation"

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female athletes with Differences
of Sex Development (DSD) into
Elite Competition: The FIMS 2021
Consensus Statement"

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Friday, March 25, 2022

7:02 a.m.

THE VIDEOGRAPHER: Good morning. We are on the record at 9:02 a.m. on March 25th of 2022. All participants are attending remotely. 07:02:02

Audio and video recording will continue to take place unless all parties agree to go off the record.

This is media unit 1 of the recorded deposition of Gregory A. Brown, Ph.D., taken by counsel for the plaintiff, in the matter of B.P.J., by her next friend and mother, Heather Jackson, versus West Virginia State Board of Education, et al., filed in the United States District Court, for the Southern District of West Virginia, Charleston Division, Case Number 2:21-cv-00316. 07:02:20 07:02:36

My name is Kimberlee Decker from Veritext Legal Solution (sic), and I am the videographer. The court reporter is Alexis Kagay. I am not related to any party in this action, nor am I financially interested in the outcome. 07:02:57

Counsel and all present will now state their appearances and affiliations for the record. If there are any objections to proceeding, please state them at 07:03:10

1 the time of your appearance, beginning with the
2 noticing attorney.

3 MR. BLOCK: Good morning. My name is
4 Josh Block from the ACLU. My pronouns are he/him. And
5 I am here on behalf of the plaintiff, B.P.J. 07:03:26

6 And I'll let my co-counsel introduce
7 themselves.

8 MS. HARTNETT: Good morning. This is
9 Kathleen Hartnett from Cooley for plaintiff.

10 MR. BARR: Good morning. Andrew Barr from 07:03:38
11 Cooley, also for plaintiff.

12 MS. KANG: Good morning. Katelyn Kang from
13 Cooley, also for plaintiff.

14 MS. REINHARDT: Good morning. Elizabeth
15 Reinhardt with Cooley for plaintiff. 07:03:52

16 MS. HELSTROM: Hello. This is Zoe Helstrom
17 with Cooley, also for plaintiff.

18 COUNSEL SWAMINATHAN: Good morning. This is
19 Sruti Swaminathan from Lambda Legal on behalf of
20 plaintiff. 07:04:04

21 MR. CHARLES: Good morning. Carl Charles,
22 he/him, with Lambda Legal for plaintiff.

23 MS. SMITH-CARRINGTON: Good morning. Avatara
24 Smith-Carrington from Lambda Legal on behalf of
25 plaintiff. 07:04:18

1 MR. FRAMPTON: I -- I think that's everyone
2 for plaintiff, but if not, correct me.

3 This is Hal Frampton with Alliance Defending
4 Freedom for the intervenor.

5 MS. CSUTOROS: This is Rachel Csutoros from 07:04:29
6 Alliance Defending Freedom for the intervenor.

7 MR. TRYON: This is David Tryon with
8 West Virginia state attorney general's office on behalf
9 of the State of West Virginia.

10 MR. CROPP: This is Jeffrey Cropp on behalf of 07:04:45
11 defendants Harrison County Board of Education and
12 Superintendent Dora Stutler.

13 MS. GREEN: This is Roberta Green, Shuman
14 McCuskey Slicer, here on behalf of WVSSAC.

15 MR. TAYLOR: This is Michael Taylor, law firm 07:05:04
16 of Bailey & Wyant, on behalf of the West Virginia State
17 Board of Education and W. Clayton Burch,
18 superintendent.

19 THE VIDEOGRAPHER: Thank you.

20 Will the court reporter please swear in the
21 witness.

22
23 GREGORY BROWN, Ph.D.,
24 having been administered an oath, was examined and
25 testified as follows:

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EXAMINATION

BY MR. BLOCK:

Q Good morning, Dr. Brown. How are you today?

A I'm doing fine. Thank you. 07:05:38

How are you today, Mr. Block?

Q I'm good. I'm good.

This is our second time seeing each other
virtually for a deposition, isn't it?

A It is. It is. 07:05:48

Q Well, could you state your name for the
record, please.

A My name is Gregory Allen Brown.

Q And have you had your deposition taken before?

A Yes, I have. 07:06:04

MR. FRAMPTON: Josh, real -- real quick, just
before we get too far, I just want to memorialize for
the record, are we proceeding under the same agreement
that all objections except to form and scope are
reserved?

07:06:16

MR. BLOCK: Yes. And -- and I'd like to
actually also propose that, of course, any party is
free to object on their own, but it is also not
necessary for multiple parties to object to the same
question that -- an objection from one defendant or

07:06:33

1 intervenor will preserve the objections for everyone
2 else as well.

3 Is that also acceptable?

4 MR. FRAMPTON: That -- that's acceptable to
5 the intervenor. 07:06:51

6 MR. TRYON: This is David Tryon. That is
7 acceptable to the State.

8 MS. GREEN: This is Roberta Green. That's
9 acceptable to WVSSAC.

10 MR. CROPP: This is Jeffrey Cropp. That's 07:07:03
11 acceptable to the Harrison County Board of Education
12 and Dora Stutler.

13 MR. TAYLOR: This is Michael Taylor. That's
14 acceptable for the State Board of Education and
15 Superintendent Burch. 07:07:14

16 MR. BLOCK: Excellent.

17 BY MR. BLOCK:

18 Q So other than your deposition with me, have
19 you had any other depositions taken?

20 A No, I have not. 07:07:27

21 Q All right. Great.

22 So I'll just review with you some ground rules
23 again, which you're -- you're probably familiar with,
24 and I have three of them.

25 You know, the first is that -- actually, it's 07:07:35

1 less applicable for a video deposition, but it's
2 important that all of your responses be verbal instead
3 of head nods so that we can have a -- a transcript of
4 your responses.

5 Does that sound good to you? 07:07:53

6 A Yes. Thank you.

7 Q Sure. The second is that we need to make sure
8 not to speak over each other. So if you could wait for
9 me to complete my question before answering and I'll
10 wait for you to complete your answer before I ask 07:08:06
11 another question.

12 Does that sound fair?

13 A I'll do my best.

14 Q So will I.

15 And the third is that, you know, as always, 07:08:16
16 it's my job to ask questions that you understand. So
17 if there's anything about my question you don't
18 understand, I'm going to rely on you to explain to me
19 that you don't understand it, and I will do my best to
20 rephrase it. But if you answer the question, I'm going 07:08:32
21 to assume that meant that you understood what I was
22 saying, okay?

23 A Sounds fair.

24 Q Terrific.

25 All right. How did you prepare for the 07:08:44

1 deposition today?

2 A Reviewed what I had written for my
3 declaration, the expert report. I had a good
4 breakfast, got a good night's sleep. I have met with
5 attorneys for Alliance Defending Freedom and 07:09:03
6 David Tryon to brief me on, you know, what happens in a
7 deposition, what I should expect.

8 MR. FRAMPTON: I'm going to instruct the
9 witness, you don't -- anything that we discussed is
10 privileged. So you can certainly tell him that you met 07:09:16
11 with us, but the substance of that discussion should
12 not be told.

13 THE WITNESS: Okay.

14 BY MR. BLOCK:

15 Q Did -- in preparation for the deposition, did 07:09:25
16 you review anything that was not cited in your report?

17 A Yes. Like previous exercise physiology
18 textbooks, lots of other things that probably weren't
19 cited in there, just in the course of general
20 knowledge. 07:09:47

21 Q And -- and you -- you've reviewed those to
22 refresh your understanding of them in preparation for
23 today's deposition?

24 A Yes. And also in preparation for teaching my
25 classes and those types of things. 07:10:00

1 Q Did you conduct any additional research to
2 prepare for today's deposition?

3 A Can you explain what you mean by "research"?

4 Q Well, I guess, did you look for new articles
5 in the field or anything like that in preparation for 07:10:17
6 the deposition?

7 A Yes. In preparation for the deposition, I
8 have looked to see if there have been any relevant new
9 publications, and I haven't come up with any that I
10 haven't cited in the deposition. 07:10:33

11 Q Great. Have you been retained as an expert
12 witness before?

13 A Yes.

14 Q I want to get a complete list of all of the
15 times you've been retained as an expert witness. 07:10:46

16 So could you tell me, to the best of your
17 recollection, the first time you were retained as an
18 expert witness?

19 A That would be for the case of Soule versus the
20 Connecticut Interscholastic Athletic Association (sic). 07:11:05

21 Q And who retained you for that case?

22 A Alliance Defending Freedom.

23 Q Great. What is the next case in which you
24 were retained as an expert witness?

25 A The next case is Hecox versus Little in the 07:11:17

1 state of Idaho.

2 Q And who retained you as an expert witness in
3 that case?

4 A That was the Idaho attorney general's office.

5 Q And what's the next case where you were 07:11:31
6 retained as an expert witness?

7 A The next case is in Florida, and I apologize,
8 I cannot remember the names and initials on that versus
9 State of Florida.

10 Q And what's the general subject of that 07:11:42
11 litigation?

12 A Similar to this one, State of Idaho, as
13 regarding a state law on women's participation in
14 women's sports.

15 Q A Florida state law? 07:11:57

16 A Yes.

17 Q And who retained you in that case?

18 A Andy Bardos, if I remember correctly on his
19 last name. I apologize if I don't get the
20 pronunciation correctly. And that is -- they're 07:12:16
21 working for the State of Florida.

22 Q Is there any other case in which you've been
23 retained as an expert witness?

24 A I have agreed to serve as an expert witness in
25 the state of Arkansas if there is a case that were to 07:12:35

1 come forth there.

2 Q Related to sports?

3 A Yes. Yeah, same topic.

4 Q But not as an expert in any other litigation

5 in Arkansas about other types of legislation; right? 07:12:47

6 A That's correct.

7 Q Is there any other case in which you've been

8 retrained as an expert witness?

9 A Just want to verify that I said them. So

10 Soule versus CIAC, Idaho, Florida, Arkansas and then 07:13:05

11 the current case.

12 Q Okay. How about in Tennessee, are you an

13 expert witness in Tennessee?

14 A No.

15 Q Have you been retained as a nontestifying 07:13:27

16 expert witness in connection with any litigation?

17 A No.

18 Q Okay. All right. So I'm going to just review

19 with you some previous expert reports you filed.

20 Actually, before I do that, have you filed an 07:13:43

21 expert report yet in the Florida litigation?

22 A No.

23 Q Okay. All right. So -- so this is going to

24 be the moment of truth. I'm going to attempt to move a

25 document into Exhibit Share, and we'll see -- we'll see 07:13:57

1 how that -- that works. All right.

2 All right. Let's see.

3 Actually, first, I'm going to try to get

4 your -- your current expert report into here. Just

5 give me half a second. 07:14:26

6 A Take your time.

7 Q Yeah, no, I might need to take my time.

8 All right. No, here's the one in your case.

9 All right. Moving it into our "Marked

10 Exhibits" folder. And in a moment, like when you 07:14:40

11 refresh, you should hopefully see a document.

12 A So is the document 2022.02.23 Brown Expert
13 Report PDF?

14 Q Yes. And -- and just --

15 MR. BLOCK: Lindsay, does that automatically 07:15:09
16 get marked as a -- a sequential exhibit number?

17 MS. DUPHILY: It -- I -- I'll fix it. And
18 I'll show you -- you need to mark it as a -- introduce
19 it as an exhibit. You just moved it.

20 MR. BLOCK: I just moved it. Okay. So sorry. 07:15:22
21 How -- how do we --

22 MS. DUPHILY: I can -- I can correct it. Go
23 ahead and continue, and I will correct it.

24 MR. BLOCK: Okay. And -- thanks.

25 Will you be able to do that for the subsequent 07:15:28

1 ones, too?

2 And sorry for my incompetence.

3 MS. DUPHILY: Why don't I just -- I will input
4 the next ones and then show you on the break how to do
5 it. 07:15:39

6 (Exhibit 64 was marked for identification
7 by the court reporter and is attached hereto.)

8 MR. BLOCK: Terrific. Thank you so much.

9 BY MR. BLOCK:

10 Q All right. Do you recognize this document? 07:15:41

11 A Yes, I do.

12 Q What is it?

13 A It is my expert declaration for the case of
14 B.P.J. versus West Virginia.

15 Q And when is it -- when is it dated? 07:16:01

16 A It states: "Executed on February 23, 2022."

17 Q And that's your signature next to it?

18 A Yes, that is.

19 Q Okay. So now I'm just going to take you
20 through some previous reports that you filed. 09:16:18

21 So if you hit refresh, you should see another
22 document titled "Brown PI decl."

23 A Yes.

24 Q Great. Do you recognize that document?

25 A Yes, I do. 09:17:01

1 Q What is it?

2 A That is my expert declaration in the case of
3 Soule versus Connecticut Association of Schools.

4 Q Great. And when is that dated?

5 A Dated February 12th, 2020. 09:17:22

6 Q Terrific. Let me take a look at that.

7 All right. Let me show you another one, I'm
8 sorry.

9 MS. DUPHILY: Maybe -- maybe we should
10 quickly, it's up to you -- 09:17:40

11 MR. BLOCK: Yeah, let's do a little bit --
12 let's go off the record, and you can give me a
13 tutorial, and then we can be -- save time.

14 THE VIDEOGRAPHER: We are off the record at
15 9:18 a.m. 09:17:49

16 (Recess.)

17 THE VIDEOGRAPHER: We are on the record at
18 9:21 a.m.

19 BY MR. BLOCK:

20 Q All right. Dr. Brown, during our break, we 09:21:05
21 sort of rechecked and marked the exhibits we
22 previously looked at.

23 Could you, just for the record, look at the
24 document marked Exhibit 64, please.

25 A All right. Exhibit 064. 09:21:26

1 Q And what is that exhibit?

2 A That is my expert declaration for B.P.J.

3 versus West Virginia.

4 (Exhibit 65 was marked for identification

5 by the court reporter and is attached hereto.) 09:21:35

6 BY MR. BLOCK:

7 Q Terrific. And -- now, can you look at the

8 document marked Exhibit 65, please.

9 A All right. 065.

10 Q And what is that -- 09:21:52

11 A Yes --

12 Q What -- what -- what is that document?

13 A That is my declaration in the case of

14 Soule versus Connecticut Association of Schools.

15 MR. BLOCK: Great. All right. And now I'm 09:22:10

16 going to give you another document to look at in a

17 minute. In your folder should be appearing a document

18 marked Exhibit 66.

19 (Exhibit 66 was marked for identification

20 by the court reporter and is attached hereto.) 09:22:16

21 BY MR. BLOCK:

22 Q Could you let me know when you see that

23 document?

24 A Exhibit 066 - WV AG?

25 Q Yes. 09:22:29

1 A And on the first page of that, it's got, in
2 large bold capital letters, "Exhibit B"?

3 Q Uh-huh.

4 A Okay.

5 Q Could you go to the second page? 09:22:46

6 A Yes.

7 Q All right. And could -- do you recognize this
8 document?

9 A Yes, I do.

10 Q And what is it? 09:22:50

11 A That is my expert declaration for the case of
12 Hecox versus Little.

13 Q Terrific. And if you scroll down to -- to
14 near the end, which I -- if we can find the date on
15 which that one was executed. It should be on page 69 09:23:05
16 of the PDF.

17 Are you -- do you see it?

18 A I'm still scrolling.

19 Q All right. You can also type in "69" in
20 the -- the -- the top box, if that make it easier too. 09:23:33

21 A Sorry. Sorry, I tried to type in "69," and I
22 accidentally Google searched for that.

23 Q Oh, well. Have you gotten to it yet?

24 A Still scrolling.

25 Q All right. 09:24:19

1 MS. DUPHILY: If you download these exhibits,
2 you can also access them easier with your software.

3 MR. FRAMPTON: I think he's almost there.

4 THE WITNESS: All right. I see my signature
5 page. Well, yeah, executed 3rd June 2020. 09:24:34

6 BY MR. BLOCK:

7 Q Terrific. And then for this litigation of
8 B.P.J., at the PI stage, you also submitted a copy of
9 this Hecox declaration; is that right?

10 A Yes. 09:24:53

11 MR. BLOCK: Okay. And then I want to show you
12 another document in a second.

13 So this document is going to be marked, as
14 soon as I'm able to mark it, as Exhibit 67. Let me
15 know when it's visible for you. 09:25:36

16 (Exhibit 67 was marked for identification
17 by the court reporter and is attached hereto.)

18 THE WITNESS: All right. Exhibit 067 -
19 Gregory Brown Male Athletic --

20 BY MR. BLOCK: 09:25:49

21 Q Yes.

22 A Yes.

23 Q What is this document?

24 A That is a "White Paper Concerning Male
25 Physiological and Performance Advantages in Athletic 09:25:58

1 Competition and The Effect of Testosterone Suppression
2 on Male Athletic Advantage."

3 Q And it's dated December 14th, 2021; correct?

4 A That is correct.

5 Q Now, this document was not prepared as an 09:26:11
6 expert report in -- in any litigation, was it?

7 MR. FRAMPTON: Object to the form.

8 BY MR. BLOCK:

9 Q Why did you prepare this document?

10 A I was asked by Alliance Defending Freedom to 09:26:25
11 prepare a white paper.

12 Q Okay. And what is a -- a white paper as
13 opposed to an expert report?

14 MR. FRAMPTON: Same objection.

15 Go ahead. 09:26:36

16 THE WITNESS: White paper is often used by an
17 organization, a company, something like that, for
18 gaining insight or information on a topic.

19 BY MR. BLOCK:

20 Q Okay. So did you -- what did you understand 09:26:48
21 to be the -- the purpose of this white paper?

22 A My understanding was that this was for
23 Alliance Defending Freedom and affiliated and interest
24 organizations to be able to review the research that I
25 summarize in that paper. 09:27:10

1 Q Okay. And did you -- did you have an
2 understanding that this white paper would be used for
3 any lobbying purposes?

4 MR. FRAMPTON: Object to the form.

5 BY MR. BLOCK: 09:27:25

6 Q You can answer, if you understand.

7 A My understanding was that Alliance Defending
8 Freedom could do it with what they wanted and people
9 could ask them for it for purposes that people want to
10 use it for. 09:27:38

11 Q But did you -- so did you know one way or
12 another whether the -- the document would be used for
13 purposes of lobbying?

14 A I assumed that it would be introduced to
15 people who are interested in what the science says on 09:27:57
16 the matter of transgender athletes competing in women's
17 sports.

18 Q And those would include legislators?

19 A Yes.

20 Q Okay. And, in fact, you have testified in 09:28:11
21 support of legislation to restrict the ability of
22 transgender girls and women to participate in women's
23 sports; is that right?

24 MR. TRYON: Objection --

25 MR. FRAMPTON: Object to the form. 09:28:26

1 MR. TRYON: -- terminology.

2 MR. FRAMPTON: Josh, real quick, could we do
3 our usual standing objection on terminology so that we
4 don't have to jump in on that every time?

5 MR. BLOCK: You know -- yes. Yes, you can. 09:28:37

6 I -- I will have some questions on that, and you can --
7 you -- you can -- if we could -- I'll give you that
8 standing objection, but the witness has also used some
9 of these terms himself in written reports, so I'm -- I
10 want to have a little colloquy with him about that. 09:28:57

11 BY MR. BLOCK:

12 Q But -- but in the meantime, you -- you have in
13 fact testified in support of legislation similar to
14 the -- the legislation at issue in this case; is that
15 right? 09:29:13

16 MR. FRAMPTON: Object to the form.

17 Go ahead.

18 THE WITNESS: Yes, I have testified in front
19 of legislative bodies regarding legislation clarifying
20 the participation of biological females in women's 09:29:25
21 sports.

22 BY MR. BLOCK:

23 Q The participation of biological females, or
24 did you mean -- did you mean to say transgender females
25 or, to use your language, biological males? I just 09:29:36

1 want to know the -- want to make sure you spoke
2 correctly.

3 A The legislation was to limit the participation
4 in girls and women's sports to biological females.

5 Q Great. And so where -- which states did you 09:29:50
6 testify in -- in support of legislation?

7 A I may not be able to remember all of them. I
8 will give you my best recollection.

9 Ohio, Pennsylvania, Texas, South Dakota,
10 Maine, North Carolina are ones that I think I testified 09:30:14
11 either in person or through Zoom.

12 Q And who asked you to testify in each of those
13 states?

14 A That would vary from one state to the next.

15 Q Okay. So let -- let's take them one at a 09:30:36
16 time.

17 In Ohio, who asked you to testify?

18 A Center for Christian Virtue.

19 Q And in Texas, who asked you to testify?

20 A Texas Values, if I remember correctly, is 09:30:50
21 their name.

22 Q And in North Carolina, who asked you to
23 testify?

24 A I can't remember their name exactly, but it
25 was something along North Carolina Family Values, 09:31:04

1 something like that.

2 Q In Pennsylvania, who asked you to testify?

3 A Pennsylvania Family Alliance, if I remember
4 correctly.

5 Q And in Maine, who asked you to testify? 09:31:17

6 A That, I think, was Save Women's Sports.

7 Q And do you know whether the legislatures in
8 any of those states received copies of your white
9 paper?

10 A I do not know if they received copies of my 09:31:32
11 white paper.

12 Q When you testified in those states, did you
13 refer to any of the analysis or research you conducted
14 in the white paper?

15 A I -- many of those were testified last year 09:31:47
16 before I had completed the white paper.

17 Q So what about the ones that were after you had
18 completed the white paper?

19 A After completing the white paper, I know I had
20 referred to my previous expert declaration in 09:32:04
21 Connecticut and Idaho. I don't remember if I referred
22 specifically to the white paper.

23 Q So in Pennsylvania, you don't know if the
24 Pennsylvania legislature had a copy of your white paper
25 or not? 09:32:21

1 A No. That was before I had written the white
2 paper.

3 Q So when did you -- during what period of time
4 did you write the white paper?

5 A Well, I started working on it essentially as 09:32:30
6 soon as I had finished the declaration for Idaho, just
7 as -- you know, trying to update as new research or new
8 information became available. And so it was over the
9 course of a year and a half, year and three-quarters
10 that I was working on the -- the white paper. 09:32:50

11 Q And had ADF asked you to -- to create the
12 right -- excuse me -- the white paper a year and a half
13 before the publication date?

14 MR. FRAMPTON: Object to the form.

15 THE WITNESS: No. I was just updating the 09:33:05
16 information so that I would be current on the topic.

17 BY MR. BLOCK:

18 Q And so when were you asked to -- to write down
19 that information in the form of a white paper?

20 A Sometime this last fall. I can't remember. 09:33:19
21 September, October, somewhere in those lines, but I
22 cannot remember exactly.

23 Q Okay. Were you paid for -- to write the white
24 paper?

25 A No, I was not. 09:33:40

1 Q So you have disclosed in your report that your
2 hourly rate for preparing your expert report; is that
3 right?

4 A That is correct.

5 Q But is it fair to say that a substantial 09:33:56
6 portion of the expert report was based on the white
7 paper?

8 MR. FRAMPTON: Object to the form.

9 THE WITNESS: That would be fair to say that.

10 BY MR. BLOCK: 09:34:05

11 Q Okay. So to the extent that any of the work
12 in the expert report was already conducted for the
13 white paper, then that was essentially done for free;
14 is that fair?

15 MR. FRAMPTON: Same objection. 09:34:19

16 Go ahead.

17 THE WITNESS: Yes, it would be fair to say
18 that the white paper was not paid for, for my work on
19 that, and so overlap between the white paper and the
20 expert report was primarily volunteer work. 09:34:30

21 BY MR. BLOCK:

22 Q And when you first became interested in the
23 topic of the participation of transgender people in
24 sports, you were the person who reached out to ADF; is
25 that right? 09:34:46

1 A That is correct.

2 Q And why did you do that?

3 A I had seen a news report about the Soule
4 versus Connecticut case and -- well, a -- a report. I
5 guess I shouldn't say "news" because I can't remember 09:35:00
6 where I saw it. And so I reached out to Alliance
7 Defending Freedom to see if I could be of help.

8 Q So you -- you personally feel strongly about
9 this issue; is that fair?

10 MR. FRAMPTON: Object to the form. 09:35:16

11 THE WITNESS: I don't know that I would
12 characterize my interest as a feeling so much as an
13 intellectual and professional interest.

14 BY MR. BLOCK:

15 Q Is there any other circumstance in which 09:35:25
16 you've reached out to an organization to volunteer
17 yourself as an expert source?

18 A Yes.

19 Q What -- can you tell me what those situations
20 are? 09:35:47

21 A I have reached out to legislators in the state
22 of Nebraska to state that I am an exercise physiologist
23 and would be willing to help if they have questions on
24 litigation in this -- or legislation in this area, not
25 just trans women's -- transgender individuals in 09:36:07

1 sports, but relative to my professional expertise in
2 exercise physiology.

3 Q Okay. Any other instance?

4 A I am trying to remember.

5 I -- I can't remember others. They may have 09:36:30
6 happened, where I reached out and did not get a
7 response.

8 Q But sitting here today, you can't remember
9 what those other instances were?

10 A That is correct. 09:36:41

11 Q Okay. And you -- you're not sure that there
12 were other instances; is that right?

13 A That is correct.

14 Q All right. So that -- that's all my questions
15 on that topic. 09:36:56

16 I do have some questions just about
17 terminology here.

18 You know what the term "cisgender" means;
19 right?

20 MR. FRAMPTON: Object to the form. 09:37:05

21 THE WITNESS: Cisgender means a person whose
22 gender identity aligns with their biology.

23 BY MR. BLOCK:

24 Q And you don't have any objection to using the
25 word "cisgender," do you? 09:37:17

1 A Yes, I do.

2 Q You've used the word "cisgender" in other
3 publications, haven't you?

4 A I have.

5 Q Okay. Why did you use the word "cisgender" in 09:37:28
6 those publications?

7 A Because it is a frequently used term in the --
8 in this field, and so it is probably the appropriate
9 term to use.

10 Q So why do you have an objection to using that 09:37:42
11 term in the deposition if -- if that's the appropriate
12 term to use?

13 MR. FRAMPTON: Object to the form.

14 THE WITNESS: I know of individuals who do not
15 like the term "cisgender" because when it is applied in 09:38:00
16 the term such as "cis male" or "cis female," they
17 consider it to be infringing upon their identity as
18 male or female and the "cis" is unnecessary.

19 BY MR. BLOCK:

20 Q Do you consider the word -- the term 09:38:20
21 "cisgender male" to be infringing upon your identity as
22 a male?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: No, I do not.

25 ///

1 BY MR. BLOCK:

2 Q Okay. Who are the individuals that -- that
3 you know that view the term "cisgender" as infringing
4 on their own identity?

5 A I could not tell you every person I know that 09:38:43
6 states that. I have colleagues and coworkers that have
7 stated that to me in private conversations, family
8 members that have stated that to me in private
9 conversations. Even students have stated to me that
10 they do not like being referred to as cisgender. 09:39:02

11 Q And have any of those people, to the best of
12 your knowledge, been directly referred to as being
13 cisgender?

14 A To my knowledge, yes, they have.

15 Q Okay. So -- but you -- you personally don't 09:39:19
16 view the term "cisgender male" as infringing on your
17 own identity; correct?

18 A That is correct.

19 Q Okay. So if I use the term "cisgender" during
20 this deposition, you'll understand what I'm talking 09:39:34
21 about; correct?

22 A Yes, I understand it is the term commonly used
23 in this type of matter, legally and professionally.

24 Q Okay. And if -- if I ask you to clarify
25 whether a particular statement that you made is 09:39:50

1 referring to cisgender males, you -- you would be able
2 to clarify that for me; correct?

3 MR. FRAMPTON: Object to the form.

4 THE WITNESS: Yes, it is my understanding that
5 a cisgender male is an individual who is biologically 09:40:04
6 male and their gender identity is male.

7 BY MR. BLOCK:

8 Q And you know what the term "transgender"
9 means; right?

10 MR. FRAMPTON: Same objection. 09:40:15

11 THE WITNESS: Yes.

12 BY MR. BLOCK:

13 Q What does it mean?

14 A Transgender is for someone whose gender
15 identity does not align with their biological sex. 09:40:25

16 Q And you don't have any objection to using the
17 word "transgender" in this deposition, do you?

18 A No, I do not.

19 Q Okay. And you've used the word "transgender"
20 in your own writings, haven't you? 09:40:38

21 A That is correct.

22 Q Okay. Do you know what the term "transgender
23 woman" means?

24 MR. FRAMPTON: Same objection.

25 THE WITNESS: I get confused with transgender 09:40:45

1 woman sometimes because I'm not sure if that means a
2 trans woman or someone who is transgender that
3 identifies as a woman.

4 Does that make sense?

5 BY MR. BLOCK: 09:41:00

6 Q Yeah. Well, so do you know what the term
7 "trans woman" means?

8 A Yes, I do.

9 Q Okay. What -- what does the word "trans
10 woman" mean to you? 09:41:09

11 A A trans woman is an individual who is
12 biologically male but whose gender identity is that of
13 a woman.

14 Q And you've used the term "trans woman" in your
15 writings, haven't you? 09:41:19

16 A That is correct.

17 Q Okay. So if I ask you to clarify whether the
18 people you refer to in a question are trans women,
19 you'll be able to clarify that for me?

20 MR. FRAMPTON: Object to the form. 09:41:34

21 THE WITNESS: Yes, I will do my best.

22 BY MR. BLOCK:

23 Q Okay. And do you know what the term
24 "transgender girl" means?

25 A Same as with transgender woman, it is 09:41:42

1 sometimes confusing to me if they mean if this is a boy
2 that identifies as girl or a girl that identifies as
3 boy.

4 Q How about if I use the term "trans girl,"
5 will -- do you understand what that would mean? 09:42:01

6 A Yes, I understand "trans girl."

7 Q Okay. And what does trans girl mean to you?

8 A A trans girl is a juvenile/youth/child whose
9 biological sex is male but who identifies as a girl.

10 Q Okay. You've been using the phrase 09:42:18
11 "biological sex"; correct?

12 A That is correct.

13 Q What is your understanding of what the term
14 "biological sex" means?

15 A So sex is a biological variable. Sex is 09:42:29
16 determined at conception with the conferral of sex
17 chromosomes.

18 Q And is it your understanding that "biological
19 sex" refers to anything other than chromosomes?

20 A Yes. 09:42:53

21 Q So what else besides chromosomes does the term
22 "biological sex" refer to?

23 A So if we are referring to a person who is a
24 biological male, they would have sex chromosomes of
25 male and their body system of organization, 09:43:08

1 anatomically and physiologically, would be around the
2 production of small gametes, which means sperm.

3 Q And how would you refer to the biological sex
4 of someone with complete androgen insensitivity
5 syndrome? 09:43:32

6 MR. FRAMPTON: Object to the form.

7 THE WITNESS: My understanding of someone with
8 complete androgen insensitivity syndrome is they are
9 biologically male, but they are not receptive to
10 androgens, but their body is still organized around the 09:43:43
11 production of sperm.

12 BY MR. BLOCK:

13 Q And how would you refer to the biological sex
14 of someone with XXY chromosomes?

15 A If I remember correctly -- 09:43:59

16 MR. TRYON: I would like to just object to the
17 scope.

18 Thank you.

19 MR. FRAMPTON: Objection; form, scope.

20 THE WITNESS: If I remember correctly, XXY is 09:44:08
21 Turner syndrome, in which a person is biologically
22 male. They have an extra X chromosome, but they are
23 still male.

24 BY MR. BLOCK:

25 Q So you define biological sex as male if there 09:44:22

1 is a Y chromosome present?

2 MR. FRAMPTON: Object to the form, scope.

3 THE WITNESS: That is the beginning of sex
4 determination, is if there is a Y or an X chromosome.

5 BY MR. BLOCK: 09:44:44

6 Q Right. So as to -- to clarify, so as long as
7 there's a Y chromosome, you, in your understanding of
8 the term "biological sex," would view that person as
9 being biologically male?

10 MR. FRAMPTON: Same objections, form and 09:44:56
11 scope.

12 Go ahead.

13 THE WITNESS: That is my understanding, yes.

14 BY MR. BLOCK:

15 Q Okay. And when -- do you have any opinions on 09:45:02
16 whether a person with complete androgen insensitivity
17 syndrome should be allowed to play on sports teams for
18 girls and women?

19 MR. FRAMPTON: Objection; form and scope.

20 Go ahead. 09:45:28

21 THE WITNESS: So situations such as complete
22 androgen insensitivity syndrome is very debated in the
23 sports science community right now on how best to
24 handle those individuals and where they should
25 participate in sports. 09:45:41

1 BY MR. BLOCK:

2 Q And what's your opinion?

3 MR. FRAMPTON: Same objections.

4 THE WITNESS: So I have been retained as an
5 expert witness in this matter primarily dealing with 09:45:49

6 biological male and biological female and not as an
7 expert on disorders or differences of sexual
8 development. And so I would say I probably would not
9 be the best person to offer a statement on where
10 someone with CAIS should participate. 09:46:05

11 BY MR. BLOCK:

12 Q But you just testified earlier that you view
13 someone with -- with CAIS as being a biological male,
14 isn't that so?

15 A That is correct. 09:46:18

16 Q And so if you're providing expert testimony on
17 the participation of biological males, wouldn't that
18 include testimony about a biological male with -- in
19 your words -- with CAIS?

20 MR. FRAMPTON: Objection; form and scope. 09:46:33

21 THE WITNESS: If I had been asked to provide
22 expert information on that matter, I could perhaps look
23 more into it, but I have not been asked to provide
24 expert witness, expert statement on where individuals
25 with disorders/differences of sexual development should 09:46:52

1 participate.

2 BY MR. BLOCK:

3 Q Okay. So you -- you have no expert opinion on
4 the participation of people with DSDs in sports for
5 girls and women; right? 09:47:05

6 MR. FRAMPTON: Objection; form and scope.

7 Go ahead.

8 THE WITNESS: In my declaration, there is a
9 small statement in there about DSDs, and I will stand
10 by that statement. 09:47:15

11 BY MR. BLOCK:

12 Q All right. Well, let's look to that.

13 If you could turn to that -- that exhibit
14 and -- and identify for me the statement about DSDs.

15 A Which exhibit number is that? 09:47:34

16 Q That's a good question. I think it's Exhibit
17 Number -- separate windows are tough. I believe it's
18 the first one up there, Exhibit 64.

19 So it might be in paragraph 4 of your report,
20 if you could look at that. 09:48:20

21 A All right. I am looking at paragraph 4.

22 Q Okay. Is this the reference to DSDs that
23 you're -- that you were referring to just now?

24 A That is correct.

25 Q Okay. So the -- the first sentence -- the 09:48:31

1 first two sentences of that paragraph say (as read):

2 "Although disorders of sexual

3 development (DSDs) are sometimes

4 confused with discussions of

5 transgender individuals, the two are

09:48:43

6 different phenomena. DSDs are

7 disorders of physical development.

8 Many DSDs are 'associated with genetic

9 mutations that are now well known to

10 endocrinologists and geneticists.'" "

09:48:57

11 Did I read that correctly?

12 A Yes, you did.

13 Q Okay. And so that's the extent of your expert

14 testimony about DSDs?

15 A That is correct.

09:49:07

16 Q Okay. Do you know if complete androgen

17 insensitivity syndrome is associated with a genetic

18 mutation?

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: I will stand by that statement

09:49:24

21 which is a quote from the endocrinology --

22 Endocrine Society.

23 BY MR. BLOCK:

24 Q But sitting here today, you don't know whether

25 CAIS is associated with a genetic mutation, do you?

09:49:32

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1 MR. FRAMPTON: Same objection.

2 THE WITNESS: I do not know off the top of my
3 head.

4 BY MR. BLOCK:

5 Q Okay. So -- so to the best of your knowledge, 09:49:44
6 does H.B. 3293 make any distinction between people with
7 DSDs and people who are transgender?

8 MR. FRAMPTON: Objection; form and scope.

9 THE WITNESS: I would need to refresh my
10 reading on that bill to see what it states on that 09:50:06
11 matter.

12 BY MR. BLOCK:

13 Q So -- but the scope of your expert testimony,
14 when you provide opinions about people who, in your
15 language, are biological males, you are limiting your 09:50:14
16 expert opinion to people who are biological males
17 who -- who are either cisgender males or trans girls
18 and trans women; is that right?

19 MR. FRAMPTON: Same objections.

20 THE WITNESS: Can you please restate the 09:50:39
21 question for me?

22 BY MR. BLOCK:

23 Q Yeah. So -- so you're providing testimony
24 about, quote, biological males; correct?

25 A Biological males and biological females. 09:50:46

1 Q Okay. So in terms of biological males, the
2 only biological males you're addressing in your
3 testimony, to -- to use your phrase, biological males,
4 are cisgender boys and men and trans girls and women,
5 but not any biological males, in your language, that 09:51:07
6 have DSDs; is that fair?

7 MR. FRAMPTON: Objection; form and scope.

8 Go ahead.

9 THE WITNESS: Yes, I was not asked to offer
10 expert opinion on differences or disorders of sexual 09:51:17
11 development.

12 BY MR. BLOCK:

13 Q All right. Including people who you consider
14 to be biological males who have DSDs; correct?

15 MR. FRAMPTON: Same objection. 09:51:28

16 THE WITNESS: That is correct.

17 BY MR. BLOCK:

18 Q Okay. Do you know what the term "sex assigned
19 at birth" refers to?

20 A Yes, I understand the term "sex assigned at 09:51:47
21 birth."

22 Q Okay. So -- so if I use the term "sex
23 assigned at birth," you can understand what I'm saying?

24 A Yes, I can understand what you're saying.

25 Q Okay. Great. 09:51:56

1 I have some questions just about your
2 education and research background, but, you know, I'd
3 prefer not to belabor them by going through your CV
4 line by line. So I'm going to ask you questions, and
5 if you think you need to refer specifically to your CV, 09:52:20
6 we can do that, but I'm hoping that's not necessary.

7 So as part of your formal education, you never
8 took any courses regarding transgender people; is that
9 right?

10 A I did not take a course where the title of the 09:52:34
11 course was "Transgender Individuals."

12 Q Okay. And did you take a course where
13 transgender individuals were discussed?

14 A Yes.

15 Q And how many courses? 09:52:52

16 A That would be difficult to say. To give a
17 number, I mean, I would be speculating right now. It's
18 been 20 years.

19 Q Do you -- do you have any specific
20 recollection of any courses where transgender people 09:53:10
21 were discussed?

22 A I am pretty sure that transgender individuals
23 were discussed in the undergraduate Abnormal Psychology
24 class I took. Very possibly in General Psychology.
25 Possibly discussed in any of the numerous physiology 09:53:25

1 classes as an undergraduate or graduate student.

2 Possibly in the endocrinology class as a graduate
3 student.

4 Q This is all just possibly; right? You don't
5 have a specific recollection? 09:53:44

6 A Just thinking, also some of the sociology
7 classes may have included it. But, again, it might
8 have; it might not have been. And also, whether that
9 was a discussion that the instructor initiated or the
10 students initiated, I couldn't testify at this point. 09:54:00

11 Q Okay. You received your undergrad degree in
12 1997; right?

13 A That is correct.

14 Q Do you -- do you think it's -- it's plausible
15 that you had a lot of discussions about transgender 09:54:11
16 people from 1993 to 1997?

17 A Yes, it's very plausible.

18 Q Okay. Have you ever -- as part of your --
19 obtaining any -- any of your degrees, did you ever
20 conduct any research concerning transgender people? 09:54:32

21 A Can you clarify what you mean by "research"?

22 Q I -- I mean original research, where you have
23 a hypothesis and you test it.

24 A So, no, I did not conduct any primary research
25 on transgender individuals. 09:54:55

1 Q Okay. Did you conduct any other form of
2 research other than what you referred to as primary
3 research?

4 A I probably looked for research papers or maybe
5 saw research papers on transgender individuals. Again, 09:55:07
6 it may have been as part of an assigned reading in a
7 class, or it may have been something come across in
8 other reading for general knowledge.

9 Q You're just saying that this could have
10 happened, but you don't have a specific recollection of 09:55:20
11 it, do you?

12 A That is correct. I did not write down in a
13 diary when I would read a paper.

14 Q Well, no, but you -- sitting here today, you
15 don't have any recollection of ever reading a paper on 09:55:30
16 transgender people as part of obtaining your
17 undergraduate, your Master's or your Ph.D. degrees;
18 correct?

19 A I don't think that's what I said.

20 Q Well, so -- 09:55:44

21 A I think I said I -- I might have. I didn't
22 say that I did not.

23 Q Well, but you don't have any affirmative
24 memory of doing so?

25 MR. FRAMPTON: Object to the form. 09:55:55

1 THE WITNESS: What do you mean by "affirmative
2 memory"?

3 BY MR. BLOCK:

4 Q Well, by -- by saying you might have, that --
5 that's different to me than saying you remember doing 09:56:04
6 it in some form, but don't remember the exact time or
7 place. So I'm trying to clarify whether you remember
8 doing it, but can't, you know, put your finger on
9 exactly when it happened, or whether you're saying you
10 can't rule out the possibility that you did it. 09:56:20

11 So are you saying that you can't rule out the
12 possibility that you did it?

13 A So I am saying that it's very likely that I
14 had discussions in classes on transgender individuals.
15 It's very likely that there was a paper that I read or 09:56:35
16 more than one paper regarding transgender individuals,
17 possibly even a textbook chapter.

18 Q Okay. And do you consider reading a textbook
19 chapter or paper for class to be academic research?

20 A Reading a scholarly paper would be considered 09:56:56
21 academic research as it could lead to something like a
22 literature review, a meta-analysis, and it is an
23 essential part of the research process.

24 Q Right. But you didn't do any reading as part
25 of preparing for literature review or meta-analysis; 09:57:11

1 correct?

2 A I did not include any in my literature review
3 or meta-analysis. I may have done reading as part of
4 my Master's thesis and doctoral dissertation.

5 I know for a fact, because of the topic of my 09:57:38
6 Master's thesis and doctoral dissertation, I had to
7 read very widely on steroid hormone, biogenesis and
8 actions.

9 Q So we had a discussion about some of this two
10 years ago. Do you think your memory about what -- your 09:57:59
11 readings was more accurate two years ago or more
12 accurate today?

13 MR. FRAMPTON: Object to the form.

14 THE WITNESS: I would say more accurate today
15 because I have -- since you asked me this two years 09:58:14
16 ago, I've thought about it more to remember, okay, did
17 this happen in Abnormal Psychology, in Sports
18 Psychology, something like that.

19 BY MR. BLOCK:

20 Q Okay. So I just want to be clear about a 09:58:23
21 distinction between conducting reading as in a -- as a
22 class assignment and conducting reading as part of your
23 research process. All right? Does that distinction
24 make sense to you?

25 A Yes. 09:58:41

1 Q Okay. So you've -- you've talked about maybe
2 reading a paper or a chapter as part of a class
3 assignment; correct?

4 A Yes.

5 Q Okay. So in terms of reading as part of your 09:58:52
6 own independent research process, do you have any
7 recollection of doing any reading about transgender
8 people as part of your own independent research process
9 while obtaining your degrees?

10 A I don't have a specific recollection of doing 09:59:09
11 that independently while reading my -- while performing
12 my Master's and doctoral research, but, again, I might
13 have.

14 Q Okay. So since receiving your doctorate until
15 the time when you first reached out to ADF, have you -- 09:59:28
16 had you ever conducted any research concerning
17 transgender people?

18 A Once again, please clarify what you mean by
19 "research."

20 Q All right. Well, let's do primary research. 09:59:42

21 A No, I had not done primary research of
22 transgender individuals.

23 Q Had you ever conducted any literature review
24 regarding transgender people?

25 A I have not formally written a literature 09:59:56

1 review.

2 Q Had you ever written a meta-analysis about
3 transgender people?

4 A No, I had not performed a meta-analysis
5 regarding transgender individuals. 10:00:07

6 Q Okay. So what other professional research
7 might you have done regarding transgender people?

8 A Trying to keep up with the legislation in
9 sports regarding the participation of transgender
10 individuals and then on seeing the legislation, out of 10:00:25
11 my own curiosity, looking to see what research was
12 informing that legislation.

13 Q Okay. In terms of original research that
14 you've done, have any of the subjects in your original
15 research been transgender, to the best of your 10:00:41
16 knowledge?

17 A To the best of my knowledge, none of any
18 subjects have been transgender.

19 Q Okay. Have you worked with transgender people
20 in any capacity? 10:00:52

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: I -- I think there are
23 individuals at the university that are transgender that
24 I have worked with on committees or other things.

25 ///

1 BY MR. BLOCK:

2 Q Okay. How many transgender people do you
3 think you've met?

4 MR. FRAMPTON: Same objection.

5 THE WITNESS: I can think of two by name and 10:01:22
6 others that I've met, but -- I've met a lot of people,
7 and so to try and come up with a number that were
8 transgender is going to be very, very difficult.

9 BY MR. BLOCK:

10 Q Have you ever appeared on any podcasts? 10:01:41

11 A Yes.

12 Q Which ones?

13 A I probably can't name all of them.

14 Q Okay.

15 A I can do my best. 10:01:55

16 Q Great.

17 A So there was a podcast Muscle for Life with --
18 with Mike Matthews, I think. I was on the Megyn Kelly
19 podcast. I was on Munk Debates podcast. I was on
20 Governor Ricketts' podcast. There's another one out 10:02:18
21 there that I remember the podcast. I don't remember
22 the name of it.

23 Q Do you remember approximately when the
24 Megyn Kelly podcast was?

25 A A little less than a year ago, if I remember 10:02:39

1 right.

2 Q And what was the topic of that podcast?

3 A That was regarding the participation of
4 biological males in female sports.

5 Q And what was the Munk Debates podcast? 10:02:51

6 A That was also about biological males
7 participating in female -- in women's sports.

8 Q And when -- when was that podcast?

9 A Last summer, maybe late last summer.

10 Q Okay. And when you refer to biological males 10:03:12
11 in these podcasts, did you discuss at all people with
12 DSDs?

13 A If we did, it was not a major topic of
14 discussion.

15 Q Okay. So your -- your podcast with 10:03:24
16 Governor Ricketts, that's on his show "The Nebraska
17 Way"; is that -- is that correct?

18 A That is correct.

19 Q Okay. And you appeared on September 1st,
20 2021? 10:03:42

21 A I will trust you on the date on that. I don't
22 remember myself.

23 Q All right. Does that sound around the time?

24 A That sounds like the right time period.

25 MR. BLOCK: Okay. Great. 10:03:53

1 So I'm going to introduce an exhibit marked 68
2 and if you can open it up.

3 The concierge -- it's an -- it's a video clip,
4 and the concierge is going to have to play it for us.

5 But let me know what appears on -- on your 10:04:18
6 screen before -- before I ask the concierge to -- to
7 play it.

8 Do you see a file?

9 (Exhibit 68 was marked for identification
10 by the court reporter and is attached hereto.) 10:04:28

11 THE WITNESS: I see Exhibit 068 - Clip, space,
12 2005.

13 BY MR. BLOCK:

14 Q Okay. I'm going to have -- I'm going to ask
15 the concierge to play the clip now. And it's -- it's a 10:04:37
16 little bit over a minute long. I didn't want to -- you
17 to think that I've cut anything off here. And then
18 after the clip plays, I'll ask you a few questions
19 about it.

20 Does that sound okay? 10:04:50

21 A Will the clip show up in the -- in this Zoom
22 meeting, or is it going to be a different window?

23 Q It's going to show up as a screen share --

24 A Okay.

25 Q -- right now. 10:05:05

1 Can you see the screen share?

2 A Yes.

3 Q Great.

4 (Video clip played.)

5 MR. BLOCK: Thank you to the concierge. 10:06:32

6 BY MR. BLOCK:

7 Q Does -- does this video clip appear to be an
8 accurate excerpt of your interview with
9 Governor Ricketts?

10 A Yes, that's me. 10:06:41

11 Q Okay. Do you still agree with everything you
12 said in that video clip?

13 MR. FRAMPTON: Objection; form and scope.

14 MR. TRYON: Objection; scope.

15 BY MR. BLOCK: 10:06:50

16 Q You can answer.

17 A Can you repeat your question, please?

18 Q Do you still agree with everything you said in
19 that video clip?

20 A Yes, I do. 10:06:58

21 Q Okay. You're not a mental health expert;
22 right?

23 A That is correct.

24 Q You don't have any education or training
25 that -- that would provide a basis for you to offer an 10:07:10

1 expert opinion on the proper healthcare for transgender
2 youth, do you?

3 MR. FRAMPTON: Objection; form and scope.

4 Go ahead.

5 THE WITNESS: No, I would not be called upon 10:07:19
6 to offer treatment for transgender individuals.

7 BY MR. BLOCK:

8 Q But my question is, to offer an expert opinion
9 on treatment for transgender individuals, you don't
10 have any, you know, credentials that would allow you to 10:07:34
11 provide an expert opinion on that topic, do you?

12 MR. FRAMPTON: Same objection.

13 Go ahead.

14 THE WITNESS: I have not been asked to offer
15 an expert opinion on the psychological or psychiatric 10:07:44
16 care of transgender individuals.

17 BY MR. BLOCK:

18 Q But my question is, do you have the
19 credentials and training that would allow you to offer
20 such an opinion, if you were asked? 10:07:52

21 MR. FRAMPTON: Same objection.

22 THE WITNESS: No, I do not have those
23 credentials or degrees.

24 BY MR. BLOCK:

25 Q Okay. In this clip, you used the word 10:08:07

1 "transgenderism"; right?

2 A That is correct.

3 Q Is that a medical term?

4 MR. FRAMPTON: Objection; form and scope.

5 THE WITNESS: I'm not sure what you mean, is 10:08:19
6 it a medical term?

7 BY MR. BLOCK:

8 Q What does transgenderism mean?

9 A An individual who is transgender.

10 Q Okay. In any of the -- the scholarly articles 10:08:28
11 that you've read about transgender people, have any of
12 them used the term "transgenderism"?

13 A I cannot recall, to answer that question, if
14 they have or have not.

15 Q Okay. In the clip, you mentioned Ben Shapiro; 10:08:45
16 correct?

17 A That is correct.

18 Q Who is Ben Shapiro?

19 A Ben Shapiro is an individual that does a lot
20 of podcasts, news clips, news interviews, speaking at 10:09:00
21 organizations on social and political matters.

22 Q Do you -- do you think he's a reliable source
23 of authority on mental healthcare for transgender
24 youth?

25 MR. FRAMPTON: Objection; form and scope. 10:09:19

1 THE WITNESS: In the role that he is filling,
2 I think Ben Shapiro is able to provide reliable
3 information on what has been written in these matters.

4 BY MR. BLOCK:

5 Q Okay. And reliable enough that you -- you 10:09:32
6 thought it was worth repeating to the audience of the
7 podcast; correct?

8 MR. FRAMPTON: Same objections.

9 THE WITNESS: That is correct.

10 BY MR. BLOCK: 10:09:49

11 Q Okay. In what context have you heard his
12 opinions about transgender youth?

13 A Do you mean context or format?

14 Q Let's start with format.

15 A So in a number of videos and radio clips and 10:10:02
16 seeing on the news, I have seen Ben Shapiro make
17 statements regarding transgender individuals.

18 Q And has that affected your own opinion on
19 these issues?

20 MR. FRAMPTON: Objection; form and scope. 10:10:21

21 THE WITNESS: No, I don't think what he has
22 said has affected my opinion.

23 BY MR. BLOCK:

24 Q Has it affected your opinion on mental
25 healthcare for transgender youth? 10:10:37

1 MR. FRAMPTON: Same objection.

2 THE WITNESS: I don't think it has affected my
3 opinion on healthcare for transgender youth.

4 BY MR. BLOCK:

5 Q Okay. Is new toy syndrome a medical term? 10:10:47

6 MR. FRAMPTON: Same objections.

7 THE WITNESS: No.

8 BY MR. BLOCK:

9 Q Okay. Do you think that receiving
10 gender-affirming care is analogous to playing with a 10:10:56
11 new toy?

12 MR. FRAMPTON: Objection; form and scope.

13 THE WITNESS: I'm sorry, can you state the --
14 restate the question?

15 BY MR. BLOCK: 10:11:13

16 Q Yeah. Do you -- do you think transgender
17 youth receiving gender-affirming care is analogous to a
18 person playing with a new toy?

19 MR. FRAMPTON: Same objections.

20 THE WITNESS: In the context that I quoted 10:11:22
21 Ben Shapiro, in that interview, it is a good analogy.

22 BY MR. BLOCK:

23 Q How is it a good analogy?

24 A As I explained in that, also as it was
25 explained by Ben Shapiro, when people get a new toy, 10:11:37

1 they're often very happy with it, and then the newness
2 wears off. That is drawn as an analogy to what has
3 been demonstrated in scholarly literature about
4 transgender individuals.

5 Q What scholarly literature? 10:11:53

6 MR. FRAMPTON: Objection; form and scope.

7 THE WITNESS: The research is cited on the
8 SEGM web page.

9 BY MR. BLOCK:

10 Q What's SEGM? 10:12:05

11 A I may not be able to tell you precisely, but
12 it is something like Society for Evidence-Based Gender
13 Medicine.

14 Q And why have you been reading the SEGM web
15 page? 10:12:25

16 MR. FRAMPTON: Objection; form and scope.

17 THE WITNESS: It is a good place to find
18 information about transgender individuals to help make
19 sure that I am staying current on the information in
20 this area. 10:12:34

21 BY MR. BLOCK:

22 Q How is information about the mental healthcare
23 of transgender individuals relevant to you in your
24 work?

25 MR. FRAMPTON: Same objections. 10:12:48

1 THE WITNESS: The mental healthcare is often
2 associated with the use of either puberty blockers,
3 testosterone suppression, estrogen administration,
4 which then has physiological effects.

5 BY MR. BLOCK: 10:13:06

6 Q So -- so you read about -- well, I -- I guess,
7 could you explain further? How -- how is utility of
8 the mental healthcare relevant to your opinion about
9 physiological issues and athletic advantages?

10 MR. FRAMPTON: Same objection, form and scope. 10:13:27

11 THE WITNESS: If an individual is being given
12 a physiologically active medicine, such as a puberty
13 blocker, such as testosterone suppression or
14 administration of estrogen, that will affect their
15 physiology, which then may or may not have an affect on 10:13:47
16 their ability to compete in athletics.

17 So it is important to know what is being done.

18 BY MR. BLOCK:

19 Q Does -- does the mental health impacts of
20 those treatments matter in terms of the physiological 10:14:04
21 effects?

22 A If the mental health treatment includes the
23 administration of physiological substances, then it
24 affects physiological responses.

25 Q Yeah, so, I guess, that's not really answering 10:14:25

1 my question.

2 So you -- you -- you talked about how, in your
3 opinion, the positive mental effects of
4 gender-affirming care for some people would -- are like
5 a new toy, that they have a positive effect and then 10:14:39
6 that positive mental health effect wears off, and my
7 question is whether the -- the fact that you alleged
8 that positive mental health effect would wear off has
9 any implication for the physiological results of having
10 taken that medication. 10:15:04

11 Does that make sense?

12 MR. TRYON: Objection --

13 MR. FRAMPTON: Objection; form.

14 MR. TRYON: -- form.

15 THE WITNESS: I would ask you to try and break 10:15:11
16 that question down a little more.

17 BY MR. BLOCK:

18 Q Sure.

19 A I'm not sure where you're going.

20 Q Sure. So the -- if -- if -- assuming that -- 10:15:17
21 taking it as an assumption, that puberty blockers and
22 gender-affirming hormones had no positive health
23 effects for mental health, how would that assumption
24 impact your opinion on the physiological effects of
25 taking those medications? 10:15:43

1 MR. FRAMPTON: Objection; form and scope.

2 Go ahead.

3 THE WITNESS: Well, puberty blockers and
4 testosterone suppression and estrogen administration
5 are physiological active substances. What they do for 10:15:57
6 mental health compared to what they do for athletic
7 performance and physiological responses might be
8 separate issues.

9 BY MR. BLOCK:

10 Q Okay. So if they're separate issues, why do 10:16:08
11 you read about the mental health effects of taking
12 those medications?

13 MR. FRAMPTON: Same objections.

14 THE WITNESS: I think I previously answered
15 this question, to know what are the treatments that are 10:16:27
16 being used that could then affect physiological
17 responses to exercise.

18 BY MR. BLOCK:

19 Q Okay. So what other sources of information do
20 you consult on the -- the mental health effects of 10:16:39
21 puberty blockers and gender-affirming hormones?

22 MR. FRAMPTON: Objection; scope.

23 THE WITNESS: So I will find scholarly
24 articles and read those to find information. A lot of
25 the information, if I find it on a web page, I will 10:17:01

1 look to see if it is to a scholarly journal, scholarly
2 article that's reputable, but then I can verify that
3 the information on the web page is valid, at least
4 based on what has been presented in scholarly
5 literature. Of course, you see things in the news as 10:17:18
6 well; right?

7 BY MR. BLOCK:

8 Q Is there any scholarly article that -- that
9 likens gender-affirming care to a new toy?

10 MR. FRAMPTON: Objection; form and scope. 10:17:32

11 THE WITNESS: I could not say.

12 BY MR. BLOCK:

13 Q Okay. What scholarly articles, sitting here
14 today, can -- can you think of having read on the topic
15 of mental healthcare for transgender youth? 10:17:46

16 MR. FRAMPTON: Same objection; form and scope.

17 THE WITNESS: So there was a review on the
18 effects of puberty blockers that was put out by Sweden,
19 Karolinski Institute, and so I read that article and
20 looked up a number of the articles that were referenced 10:18:11
21 in there. Similar type of thing came out of
22 Great Britain, their national health organization,
23 something like that. And so I looked at a lot of those
24 articles.

25 I -- I have also, again, coming across some on 10:18:24

1 PubMed or Google Scholar. I've seen other articles
2 looking at the effects of hormone treatment in
3 transgender individuals and measures of mental health.

4 BY MR. BLOCK:

5 Q And can you remember any of the articles on 10:18:39
6 PubMed or Google Scholar?

7 A I cannot remember them by author or title.

8 Q Okay. Have you read the Endocrine Society
9 guidelines on providing gender-affirming care to
10 transgender people? 10:18:58

11 A I --

12 MR. FRAMPTON: Objection; scope.

13 Go ahead.

14 THE WITNESS: I have read the information on
15 the web page. I have read the article. I cannot 10:19:04
16 remember which journal it's published in.

17 BY MR. BLOCK:

18 Q Well, I'm sorry, what -- what -- what are you
19 referring to when you say a web page and an article?

20 A So the Endocrine Society has a web page 10:19:22
21 regarding the administration of puberty blockers and
22 estrogen -- or testosterone suppression, estrogen
23 administration for -- for transgender individuals. And
24 so I have read through that web page, and there is an
25 article associated with the information on that web 10:19:42

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1 page that was published in a scholarly journal.

2 Q Okay. And -- and that -- that would be the --
3 the -- the 2017 guidelines for care of people with
4 gender dysphoria and gender incongruence?

5 A That is my recollection, yes. 10:19:57

6 Q When did you read that?

7 A Sometime in the past year.

8 Q So at the time of our past deposition, you
9 hadn't read that yet; is that correct?

10 A As I recall, that is correct. 10:20:14

11 Q Okay. But -- but since then, you have read
12 it?

13 A Yes. You seem to make a strong suggestion
14 that I should read that.

15 Q Okay. Did you learn anything from reading it? 10:20:26

16 A Yes, I did.

17 Q What did you learn?

18 A I learned that the recommendations of the
19 Endocrine Society for testosterone suppression result
20 in much, much lower testosterone concentration than 10:20:39
21 those recommended by world -- or, sorry, by world sport
22 or by the Olympics.

23 Q Great. Just to close the loop, can you think
24 of any other source of information or political
25 commentator you've heard and talk about transgender 10:21:05

1 youth who you think provides a good description of the
2 science?

3 MR. FRAMPTON: Objection; form and scope.

4 THE WITNESS: So I've cited a number of papers
5 in my article -- or, sorry, in my expert declaration. 10:21:25
6 So I've read those articles of scholars.

7 As far -- as far as political commentary, it's
8 all over the place these days, so it's hard to identify
9 who has or has not opined on that.

10 Q All right. Do you -- I'm going to turn to a 10:21:42
11 new line of questions. Do you need a break before
12 then?

13 A Yeah, let's take five.

14 Q Okay. Great.

15 THE VIDEOGRAPHER: We are off the record at 10:21:59
16 10:22 a.m.

17 (Recess.)

18 THE VIDEOGRAPHER: We are on the record at
19 10:29 a.m.

20 MR. BLOCK: Great. 10:29:11

21 BY MR. BLOCK:

22 Q I want to go back in time and ask you about
23 the time that you first reached out to ADF on this
24 issue of the participation of transgender athletes.

25 Do you remember who you contacted at ADF? 10:29:30

1 A I do not remember who I contacted.

2 Q And do you remember why you knew that ADF was
3 the organization to contact?

4 A I saw a news clip or information online about
5 the Soule versus CIAC case, and it identified Alliance 10:29:57
6 Defending Freedom as representing Selina Soule.

7 Q Okay. And, you know, at the time you first
8 contacted ADF, had you done any research on the -- the
9 effects of puberty blockers or gender-affirming
10 hormones on transgender people? 10:30:19

11 A Once again, what do you mean by "research"?

12 Q Have you -- had you read anything on the -- on
13 the physiological effects of gender-affirming care at
14 the time you first reached out to ADF?

15 A Yes, I had. 10:30:39

16 Q What had you read?

17 A I had read some articles on the effects of
18 gender-affirming hormone therapy, to use your
19 terminology on that, on various physiological factors,
20 such as muscle size or strength or muscle mass, those 10:30:55
21 types of things.

22 Q You -- you had already read that research
23 before you reached out to ADF?

24 A I had read some.

25 Q Okay. And had you read that research before 10:31:10

1 you saw the news item about the transgender runners in
2 Connecticut?

3 A Yes.

4 Q Okay. So -- so you -- you had previously had
5 occasion to read research on the effects of 10:31:26
6 gender-affirming hormones on muscle mass, and then you
7 saw the news clip about the runners in Connecticut, and
8 then you contacted ADF? That's the chronology of how
9 it went?

10 MR. FRAMPTON: Objection; form. 10:31:39

11 THE WITNESS: Yes, that sounds like a correct
12 timeline.

13 BY MR. BLOCK:

14 Q Okay. And what -- what would have prompted
15 you to -- to do any research specifically on the 10:31:48
16 effects of gender-affirming hormones before seeing the
17 news item about transgender people in Connecticut?

18 A As I had mentioned previously, staying up to
19 date on what the laws are or the rules, I guess would
20 be a more appropriate way to say it, regarding the 10:32:10
21 participation of transgender women in women's sports or
22 trans women in women's sports. Student questions,
23 asking about that. Particularly after 2019, when
24 Cecé Telfer won the 400-meter hurdles in Division II,
25 because I had some students that were there and had 10:32:35

1 questions.

2 Q What do you mean, that were there?

3 A I have students that are student athletes that
4 compete in Division II women's track and field and were
5 at that national championship where Cecé Telfer won the 10:32:53
6 400-meter hurdles.

7 Q And were those students upset that Cecé Telfer
8 had won?

9 MR. FRAMPTON: Form.

10 THE WITNESS: The students had questions and 10:33:05
11 many of them stated questions such as how can that be
12 fair.

13 BY MR. BLOCK:

14 Q So were they upset?

15 MR. FRAMPTON: Same objection. 10:33:20

16 THE WITNESS: I guess I would need more
17 clarification on "upset."

18 BY MR. BLOCK:

19 Q So they didn't think it was fair?

20 A That would be correct. 10:33:32

21 Q And so in response to those student questions,
22 you -- you started doing research; is that right?

23 A I had been looking it prior to the student
24 questions, but in response to the student questions, I
25 suppose you could say I tried to dig deeper. 10:33:52

1 Q Okay. So what -- what -- how had you been
2 looking into it before the student questions?

3 A Before the student questions, I would look at
4 the policies as put out by the NCAA, put out by the
5 N -- IOC and tried to look at research that informed 10:34:08
6 those policies by searching Google Scholar, PubMed,
7 reading news articles about it and see if they had
8 links or information on research.

9 Q And what about Cecé's participation did the
10 students think were unfair? 10:34:26

11 A Cecé is a biological male and was competing in
12 women's sports.

13 Q And why did they think that was unfair?

14 A They thought it was unfair for a biological
15 male to compete in women's sports. 10:34:43

16 Q And when you say you did earlier research on
17 NCAA policy and the IOC, you know, what had prompted
18 you to do that research?

19 A It's an important topic in sports, in my
20 field. It's possible that the textbook I was using at 10:35:03
21 the time had a statement on it.

22 Q Had you done any research on the participation
23 of Caster Semenya in the IOC?

24 A I have read some news articles on
25 Caster Semenya and probably heard some things on 10:35:20

1 podcasts about Caster Semenya.

2 Q Okay. But you didn't do any research about
3 that?

4 A I -- again, more than news articles, I cannot
5 recall a specific article that said this was 10:35:37
6 Caster Semenya's medical condition in the scholarly
7 literature.

8 Q Okay. But you were more interested in doing
9 research on transgender athletes than on athletes like
10 Caster Semenya; is that fair? 10:35:54

11 MR. FRAMPTON: Objection; form.

12 THE WITNESS: That would be fair to say.

13 BY MR. BLOCK:

14 Q Okay. And why is that?

15 A We are dealing with separate issues. 10:36:06
16 Disorders of sexual development are not the same as a
17 transgender individual.

18 Q And so why were you more interested in the
19 participation -- researching the participation of
20 transgender individuals as opposed to individuals with 10:36:20
21 DSDs?

22 MR. FRAMPTON: Same objection.

23 THE WITNESS: The policies seem to, if I
24 recall, state "transgender individuals." The student
25 questions were about transgender individuals. The 10:36:35

1 stuff I was seeing in the news was about transgender
2 individuals.

3 BY MR. BLOCK:

4 Q When did the topic of the participation of
5 transgender individuals in -- in sports first come to 10:36:45
6 your attention?

7 A That would be very challenging to say, but I
8 would say sometime after 2004.

9 Q Why sometime after 2004?

10 A That seems to be the first IOC policy I 10:37:04
11 remember that addressed transgender individuals.

12 Q And when did a transgender individual first
13 participate in the Olympics?

14 A I don't know.

15 Q You have no idea? 10:37:23

16 A No.

17 Q Do you know if it was, like, before 2010?

18 A I don't know.

19 Q Okay. You have no -- do you have any
20 knowledge or recollection of any transgender people 10:37:45
21 participating in the Olympics?

22 A Would you consider the participation of
23 Bruce Jenner to be a transgender individual
24 participating in the Olympics?

25 Q About a -- a -- a transgender person competing 10:38:01

1 post transition.

2 A So I do know of someone that has done that.

3 Q Who?

4 A Laurel Hubbard.

5 Q Okay. Anyone before her? 10:38:19

6 A I cannot recall anyone before that.

7 Q Okay. When did you first -- when did you
8 first become -- well, let me -- I'll -- I'll -- I'll
9 come back to that.

10 When -- when is the first time a transgender 10:38:42
11 person -- a transgender woman competed in women's
12 tennis events?

13 A I -- I don't know.

14 Q You -- you have no idea?

15 A There's something I seem to recall of a 10:39:05
16 situation that was in the '70s or '80s, but I can't
17 recall off the top of my head more specifics.

18 Q Does the name Renée Richards refresh your
19 recollection about it?

20 A So as you mention that, yes, the name 10:39:24
21 Renée Richards playing tennis -- again, I couldn't, at
22 this point in time, put it in a timeframe other than I
23 think it was probably before I was even in college.

24 Q Okay. And when did you first become aware
25 that that had happened? 10:39:40

1 A Sometime in the past 15 or so years. In my
2 readings, I remember seeing something about
3 Renée Richards.

4 Q Okay. And did the readings -- what did the
5 readings say about her? 10:39:55

6 A I can't recall at this point in time.

7 Q Okay. And did you have any feelings about
8 whether it was fair for her to be participating in
9 women's tennis in the '70s?

10 MR. FRAMPTON: Objection; form and scope. 10:40:06

11 Go ahead.

12 THE WITNESS: I -- I would, once again, go
13 back to my statement that if Renée Richards was a
14 biological male, then biological males have advantages
15 over biological females in sports. 10:40:23

16 BY MR. BLOCK:

17 Q Yeah, but I'm just -- I'm asking about, sir,
18 when you formed an opinion about -- about
19 Renée Richards, if you do -- if you did form an opinion
20 about Renée Richards, like when you -- when you first 10:40:35
21 heard about it, did you have an opinion about it being
22 fair or unfair?

23 MR. FRAMPTON: Same objection.

24 MR. TRYON: Objection.

25 THE WITNESS: So I -- I think I answered that 10:40:46

1 when I stated that biological males should not be
2 competing in women's sports.

3 BY MR. BLOCK:

4 Q Okay. So -- but you had that opinion the
5 first time you heard about Renée Richards; right? 10:40:58

6 MR. FRAMPTON: Same objections.

7 THE WITNESS: Again, where I can't put in a
8 specific timeframe when I first heard about
9 Renée Richards, I can't say if Renée Richards
10 influenced my opinion one way or another or what my 10:41:15
11 opinion was before reading that article.

12 BY MR. BLOCK:

13 Q So did you have an opinion about the
14 participation of transgender athletes in women's sports
15 before you did further research on the topic? 10:41:32

16 MR. FRAMPTON: Objection; form and scope.

17 THE WITNESS: Well, as long as I can recall,
18 sports has been separated. So you have sports for men,
19 meaning biological men, and sports for women, meaning
20 biological women, and that separation has been there. 10:41:51
21 Again, as long as I can recall, my knowledge of anatomy
22 and physiology, since I have been involved in study of
23 anatomy and physiology as a student, indicates there
24 are differences.

25 ///

1 BY MR. BLOCK:

2 Q Okay. And so -- so that was your -- that was
3 your sort of baseline assumption before you conducted
4 research, that -- that it would be unfair to allow a
5 transgender woman to participate in women's sports? 10:42:16

6 MR. FRAMPTON: Objection --

7 MR. TRYON: Objection.

8 MR. FRAMPTON: -- form.

9 THE WITNESS: I think it would be fair to say
10 that based on the experience that sports have been 10:42:26
11 separated by sex and knowing of the differences between
12 biological males and biological females, there's a --
13 they should be separated on sex.

14 BY MR. BLOCK:

15 Q All right. Just going to -- going on to a -- 10:42:47
16 a new topic now.

17 In your report, you say that even before
18 puberty, prepubertal boys outperform prepuberto --
19 prepubertal girls in athletic competition; right?

20 A Yes, I state that in my report. 10:43:08

21 Q Okay. And you -- and you attribute those
22 differences in performances to biological factors
23 instead of social ones?

24 MR. FRAMPTON: Objection; form.

25 You can -- 10:43:17

1 THE WITNESS: Yes, biological factors are the
2 primary reason that boys outperform girls in athletic
3 events.

4 BY MR. BLOCK:

5 Q Yeah, so -- but for prepubertal boys and 10:43:29
6 prepubertal girls, you attribute their difference in
7 performance to biological factors?

8 A That is correct.

9 Q Okay. What biological factors provide an
10 advantage to prepubertal boys over prepubertal girls? 10:43:48

11 A Boys have more lean body mass, which includes
12 more lean muscle mass, than girls. There are perhaps
13 other factors that contribute to that more lean body
14 mass and more muscle mass.

15 Q What does that -- what does that mean, there 10:44:09
16 other factors that contribute to the more lean body
17 mass and lean muscle mass?

18 A Well, having a Y chromosome compared to being
19 XX chromosome, there are a multitude of genes in
20 muscles that respond to the Y chromosome differently 10:44:30
21 than they do to X chromosomes.

22 Q And is there any research on how they respond
23 before puberty?

24 A The research is focused on the fact that there
25 is a difference in lean body mass before puberty. 10:44:50

1 Q Okay. So besides --

2 A To the best of my knowledge.

3 Q Sorry, I didn't mean to cut you off.

4 Besides lean body mass and lean muscle mass,
5 are there any other physiological differences connected 10:45:01
6 to athletic performance between boys and girls --

7 MR. FRAMPTON: Same objection.

8 BY MR. BLOCK:

9 Q -- before puberty?

10 A Yes. There are differences in overall growth 10:45:12
11 between boys and girls, as evidenced by the CDC and the
12 World Health Organization having separate growth charts
13 for both male and female fetuses and for boys and
14 girls.

15 Q But -- but in terms of physiological 10:45:25
16 characteristics associated with athletic performance,
17 what other physiological differences besides 10 percent
18 difference in lean body mass and lean muscle mass?

19 MR. FRAMPTON: Objection; form:

20 THE WITNESS: I would say -- that is the one 10:45:43
21 that we will focus on because that is the one that has
22 been fairly well demonstrated. There has to be
23 something else that contributes that lean body mass
24 biologically.

25 ///

1 BY MR. BLOCK:

2 Q Okay. Do you -- but you can't think of any
3 other measurable factor besides lean body mass that is
4 tied to athletic performance advantages for prepubertal
5 boys over prepubertal girls; right? 10:46:21

6 MR. FRAMPTON: Objection; form.

7 Go ahead.

8 THE WITNESS: Well, the paper by Eiberg that's
9 cited in my report demonstrated differences in VO2 max,
10 even when controlled for lean body mass, it seemed like 10:46:33
11 the boys' VO2 max was higher.

12 BY MR. BLOCK:

13 Q Okay. Did the McManis article also confirm
14 those findings?

15 A I would need to look at the McManis article to 10:46:46
16 refer. I cannot remember if McManis -- it was written
17 after Eiberg, I think, but I cannot remember if they
18 cite Eiberg.

19 Q Okay. Well, we might -- we might come back to
20 that. 10:47:33

21 The difference in lean body mass and lean
22 muscle mass that you refer to in your report is a
23 10 percent difference?

24 MR. FRAMPTON: Objection; form.

25 Go ahead. 10:47:40

1 THE WITNESS: The 10 percent number is stated
2 in the article by McManis.

3 BY MR. BLOCK:

4 Q Do you have any other knowledge of the
5 difference besides 10 percent? 10:47:49

6 A I cite several articles demonstrating
7 difference in body composition in children prepuberty.
8 I would need to look at those articles to either
9 calculate the difference myself or see if they specify
10 the difference. 10:48:05

11 Q But in your report, you -- you quoted the
12 10 percent figure; correct?

13 A That is correct.

14 Q Okay. If you could turn to your report, which
15 I believe is -- is Exhibit 46 -- 64. I got that 10:48:24
16 flipped.

17 A All right.

18 Q Thank you. I'm going to point you to a
19 specific paragraph in a second.

20 Paragraph 42 on page 17. 10:49:27

21 A Sorry, the page numbering on the document is
22 different than the page number that Acrobat --

23 Q No.

24 A -- is taking me to, so it will take me a
25 second, sorry. 10:49:59

1 Q Sure thing.

2 A All right. Paragraph 42.

3 Q You say (as read):

4 "No -- No single physiological

5 characteristic alone accounts for all 10:50:05

6 or any one of the measured advantages

7 that men enjoy in athletic

8 performance."

9 Do you see that?

10 A Yes, I do. 10:50:13

11 Q Okay. So does a difference in lean body mass

12 account for all or any one of the measured advantages

13 that men enjoy in athletic performance?

14 A Lean body mass is a major factor that provides

15 men -- males with athletic advantages over females. 10:50:34

16 Q Does it -- does it alone account for all or

17 any one of the measured advantages that men enjoy in

18 athletic performance?

19 MR. FRAMPTON: Objection; form.

20 THE WITNESS: I think I've answered your 10:50:57

21 question by stating it's a major factor, but not the

22 only factor.

23 BY MR. BLOCK:

24 Q Is -- are there any studies about the -- a

25 difference -- about the effect of a 10 percent 10:51:04

1 difference in lean body mass on athletic performance?

2 A I'm going to say yes, I'm sure there's studies
3 that are correlating lean body mass with performance.

4 Q But my question is a 10 percent difference in
5 lean body mass. 10:51:26

6 MR. FRAMPTON: Objection; form.

7 THE WITNESS: Again, there are -- I -- I will
8 say there are studies that are correlating percent lean
9 body mass with athletic performance in all sorts of
10 different events, and so that would include a 10:51:42
11 10 percent difference, along with other differences,
12 probably.

13 BY MR. BLOCK:

14 Q You -- you don't cite anything in your report
15 that purports to study the effect of a -- a 10 percent 10:51:51
16 difference in lean body mass in athletic performance,
17 do you?

18 MR. FRAMPTON: Same objection.

19 THE WITNESS: Can you clarify what you're
20 trying to ask me there? 10:52:05

21 BY MR. BLOCK:

22 Q In your report, do you cite any studies
23 reflecting what affect a difference in -- I'll say that
24 again, sorry.

25 Do you, in your report, cite any studies 10:52:21

1 measuring the effect of a 10 percent difference in lean
2 body mass on athletic performance?

3 MR. FRAMPTON: Objection; form.

4 THE WITNESS: I don't recall citing any
5 studies that specifically identify how much a 10:52:35
6 10 percent advantage enhances performance.

7 BY MR. BLOCK:

8 Q Okay. Thank you.

9 Are you aware of any study proving that
10 differences in athletic performance between prepubertal 10:53:01
11 boys and girls are caused by biological factors and not
12 social ones?

13 MR. FRAMPTON: Objection; form.

14 THE WITNESS: From a scientific standpoint,
15 science does not prove. 10:53:19

16 BY MR. BLOCK:

17 Q Science does not prove what?

18 A Science doesn't prove anything from a
19 scientific standpoint.

20 Q Well, do you have -- are there any articles 10:53:31
21 that purport to exclude social factors as a cause of
22 difference in performance between prepubertal boys and
23 prepubertal girls?

24 A Yes. Eiberg.

25 Q How does that purport to exclude social 10:53:47

1 factors?

2 A So Eiberg measured six- to seven-year-old boys
3 and girls, very objectively measured physical activity
4 in those children, measured very objectively VO2 max in
5 those children and body composition in those children 10:54:09
6 and found that even for the children of the same amount
7 of physical activity, boys have higher fitness.

8 Q And what -- what do you mean, even for
9 children of the same physical activity?

10 A So boys and girls that engage in the same 10:54:24
11 amount of physical activity -- running, jumping,
12 whatever constitutes physical activity -- the boys had
13 higher fitness.

14 Q So -- but does this mean physical activity in
15 terms of what was measured, like for a particular 10:54:40
16 event, or -- or physical activity in all aspects of
17 their life?

18 A This was physical activity as measured by an
19 accelerometer which measures the quantity and intensity
20 of physical activity during the time period the 10:54:54
21 accelerometer is worn.

22 Q Okay. So can you just explain to me how that
23 can give you information about, you know, whether these
24 boys and girls, as a general matter, like, were equally
25 physically active, like, outside of the laboratory? 10:55:16

1 A Sure. So an accelerometer is a small device
2 that is typically worn on your belt, usually on your
3 right hip, aligned over your knee, and then that
4 accelerometer, because of the scientific engineering --
5 okay, I'll call it voodoo magic, but that's not really 10:55:37
6 the right way to say it. The way the accelerator
7 works, it measures the movement of the body, and then
8 it quantifies that movement as far as intensity.

9 And then after your study period, you have the
10 person wear the accelerometer for the period of time 10:55:54
11 you want, typically free living, you put it on the
12 children and ask them to wear it for a week or two
13 weeks or however long, then you come back, you connect
14 the accelerometer to the computer, it downloads the
15 information from the accelerometer, gives you what are 10:56:07
16 known as counts. And again, you can quantify those
17 counts as sedentary, light, moderate or vigorous
18 intensity physical activity.

19 So between the two, you get an amount of
20 physical activity, an intensity of physical activity 10:56:22
21 for the given time period of study.

22 Q And so what -- what this study found is that
23 people who were similarly -- like, just active during
24 the period in which they were wearing this device, the
25 boys were more physically fit than the girls? 10:56:45

1 does the study add to that, in terms of translating
2 that into an athletic advantage?

3 MR. FRAMPTON: Objection; form.

4 THE WITNESS: What the study is doing is
5 quantifying and clarifying the differences between boys 10:58:29
6 and girls that -- well, for the same amount of physical
7 activity, boys have a higher VO2 max than girls.

8 Q Anything else besides the VO2 max?

9 MR. FRAMPTON: Objection; form.

10 THE WITNESS: And again, body composition, 10:58:51
11 which, again, lean body mass is another determinant of
12 potential for athletic performance and performance in
13 sorts.

14 BY MR. BLOCK:

15 Q But -- but that's just confirming something 10:59:02
16 that we already know, that -- that prebortal boys --
17 prepubertal boys have, on average, 10 percent more lean
18 body mass?

19 MR. FRAMPTON: Objection; form.

20 THE WITNESS: If I recall, the study also 10:59:17
21 validated that for the same body composition, the boys
22 had a higher VO2 max. I would need to refer to the
23 study to verify if that was in there.

24 Q Okay. Anything else that -- that you think
25 purports to exclude social causes as a difference in 10:59:41

1 measured athletic performance --

2 MR. HAMPTON: Objection; form.

3 BY MR. BLOCK:

4 Q -- between prepubertal boys and prepubertal

5 girls? 10:59:56

6 MR. FRAMPTON: Sorry, same objection.

7 Go ahead.

8 THE WITNESS: So again, those papers that I

9 cite showing the differences in body composition

10 between prepubertal boys and prepubertal girls because 11:00:03

11 lean body mass is a biological factor.

12 BY MR. BLOCK:

13 Q Right. But besides body composition, I'm

14 talking about athletic performance. And is there

15 anything else that purports exclude social causes for 11:00:17

16 differences in athletic performance as opposed to body

17 composition?

18 MR. FRAMPTON: Same objection.

19 THE WITNESS: To the best of my knowledge,

20 there are no studies quantifying the effects of social 11:00:30

21 causes on differences in athletic performance or

22 physiological factors of athletic performance between

23 boys and girls.

24 BY MR. BLOCK:

25 Q In preparation for your report, did you 11:00:41

1 conduct original research on the athletic performance
2 of prepubertal boys and prepubertal girls?

3 A I have --

4 MR. FRAMPTON: Objection; form.

5 Go ahead. 11:00:59

6 THE WITNESS: I have downloaded, as stated in
7 my report, data from Athletic.net, looking at the
8 performance of seven-and eight-year-old children, of
9 nine- and ten-year-old children, which are presumed to
10 be prepubertal, and not just the numbers in the report, 11:01:14
11 but other data, I have analyzed it statistically, and
12 the boys outperform the girls in all of the track
13 events that I analyzed.

14 BY MR. BLOCK:

15 Q Have you tried to have your analysis published 11:01:25
16 anywhere?

17 A The analysis is being presented at UNK Student
18 Research Day Thursday of next week. After
19 presentation, the student author and I will probably
20 explore publication opportunities. 11:01:39

21 BY MR. BLOCK:

22 Q All right. But you haven't so far?

23 A No, I have not submitted it for publication
24 yet.

25 Q Okay. You've been writing on this topic in 11:01:46

1 the form of white papers and expert reports for over
2 two years now; right?

3 A That is correct.

4 Q Have you ever attempted to submit any of your
5 analysis for publication? 11:02:02

6 A I have not submitted these papers for
7 publication.

8 Q But your -- have you ever, like, tried to
9 submit your research on this topic in -- in general for
10 publication? 11:02:18

11 MR. FRAMPTON: Objection; form.

12 THE WITNESS: So in general, do you mean
13 differences between boys and girls?

14 BY MR. BLOCK:

15 Q I mean on the participation of transgender 11:02:27
16 girls and women.

17 A So as stated in my declaration, I have the
18 Physiology Educator (sic) Community of Practice blog
19 post that I have written, that was reviewed prior to
20 being published on the web, and I have the presentation 11:02:43
21 I made at the American Physiological Society Sex and
22 Gender conference.

23 Q Okay. Anything else?

24 A Those are the only two that I can remember
25 that I have put out for public dissemination. 11:02:58

1 Q Okay. And were -- were either of those two
2 examples peer reviewed?

3 A They were both peer reviewed.

4 Q Okay. Have you had -- well, we'll look at --
5 we'll look at those in -- in a minute, but there's no 11:03:16
6 other example of you attempting to submit work on this
7 topic to a peer-reviewed publication?

8 A I have reached out to a journal editor about a
9 possible letter to the editor, but the journal said
10 they don't publish letters to the editor. 11:03:40

11 Q Okay. Why didn't you attempt to have your
12 white paper, you know, published by a peer-reviewed
13 journal?

14 A Well, quite honestly, because Emma Hilton,
15 Tommy Lundberg, Joanna Harper and FIMS have all already 11:03:59
16 published on this and have done a pretty good job
17 reviewing the literature, so I'm not sure that another
18 review of the literature is going to add to the
19 scholarly knowledge.

20 Q What did the letter to the editor that you 11:04:12
21 wanted to write say?

22 A I just asked the editor if they would accept a
23 letter regarding the participation of trans women in
24 women's sports.

25 Q What publications was that? 11:04:27

1 A I cannot remember if it was Medicine & Science
2 in Sports & Exercise or the Journal of Strength and
3 Conditioning Research.

4 Q Okay. And did you say what the letter would
5 opine about? 11:04:43

6 A No.

7 MR. FRAMPTON: Objection; form.

8 THE WITNESS: Sorry.

9 I just asked if they would accept a letter on
10 the topic. 11:04:52

11 BY MR. BLOCK:

12 Q Okay. Are you aware of any studies that
13 specifically examine the athletic performance of
14 prepubertal transgender girls?

15 MR. FRAMPTON: Objection; form. 11:05:07

16 THE WITNESS: I am not aware of any studies
17 evaluating the performance of prepubertal biological
18 gir- -- biological boys competing in girls' sports.

19 BY MR. BLOCK:

20 Q Okay. So let's -- we agreed before that if I 11:05:18
21 say the term, you know, "trans girls," you understand
22 what I'm saying; right?

23 A Yes. I just am speaking to make sure I'm
24 clear to myself in what I'm saying.

25 Q Okay. So, you know, I -- I understand that 11:05:31

1 there's physical fitness data on -- on prepubertal boys
2 versus prepubertal girls, and my question is, are you
3 aware of any data that specifically breaks out
4 prepubertal trans girls and reports on their
5 performance? 11:05:53

6 A I am not aware of any data analyzing trans
7 girls.

8 Q Okay. So are you aware of any data comparing
9 the performance of prepubertal trans girls to
10 prepubertal cis girls? 11:06:12

11 A I am not aware of any research on that topic.

12 Q Okay. If you could turn to page -- sorry --
13 paragraph 114 of your report again.

14 A Yes, paragraph 114, page 37.

15 Q Okay. I have to pull it up, too. 11:06:38

16 All right. And it -- it continues from page
17 37 to 38. You say (as read):

18 "While boys exhibit some performance
19 advantages even before puberty, it is
20 both true and" -- 11:06:52

21 Sorry, my -- my PDF -- I'll read this again
22 for the record. I apologize. (As read):

23 "While boys exhibit some performance
24 advantages even before puberty, it is
25 both true and well known to common 11:07:03

1 experience that the male advantage
2 increases rapidly, and becomes much
3 larger, as boys undergo puberty and
4 become men. Empirically, this can be
5 seen by contrasting the modest 11:07:17
6 advantages reviewed immediately above
7 against the large performance
8 advantages enjoyed by men that I have
9 detailed in Section II."

10 Did I read that right? 11:07:26

11 A It sure seemed like you read it word for word.

12 Q All right. Thanks, I did my best.

13 So even though you contend that boys have a
14 performance advantage before puberty, you believe those
15 advantages are modest when compared with the large 11:07:41
16 performance advantages resulting from puberty?

17 MR. FRAMPTON: Objection; form.

18 THE WITNESS: Yes, they are smaller than the
19 advantages that occur after puberty.

20 BY MR. BLOCK: 11:07:55

21 Q Okay. And -- and "modest" was your word;
22 right?

23 A Yes, "modest" was my word.

24 Q Okay. And do you think it's unfair for
25 prepubertal boys and girls in elementary school to -- 11:08:11

1 to play on coed or mixed teams?

2 MR. FRAMPTON: Objection; form, scope.

3 THE WITNESS: Before puberty, boys have
4 athletic advantages compared to girls.

5 BY MR. BLOCK: 11:08:29

6 Q Do you think it's unfair for prepubertal boys
7 and girls in elementary school to play on coed or mixed
8 teams?

9 MR. FRAMPTON: Same objections.

10 THE WITNESS: I really haven't been retained 11:08:38
11 as an expert witness to state fair or unfair in this
12 matter as much as to provide the information and allow
13 the policymakers to determine fair versus unfair.

14 BY MR. BLOCK:

15 Q Okay. So you're not, in your expert report, 11:08:50
16 providing an opinion on whether it's fair for trans
17 girls and women to compete on women's sports teams; is
18 that right?

19 MR. FRAMPTON: Objection; form and scope.

20 Go ahead. 11:09:05

21 THE WITNESS: In my expert report, I have done
22 my best to focus on the known biological differences
23 between males and females, how those known biological
24 differences gives male an athletic advantage and how
25 that athletic advantage is not erased by a transgender 11:09:17

1 identity or the use of puberty blockers, gender --
2 transgender hormones.

3 BY MR. BLOCK:

4 Q Okay. So you don't provide an expert opinion
5 on whether the goals of fairness, safety and 11:09:30
6 transgender inclusion are reconcilable?

7 MR. FRAMPTON: Objection; form.

8 THE WITNESS: If I recall correctly, I think I
9 quote a source or two that state on that or perhaps
10 paraphrase a source or two on what has been stated on 11:09:49
11 that.

12 BY MR. BLOCK:

13 Q Okay. So -- so just to clarify the scope of
14 the opinions you're offering, you are not presenting an
15 expert opinion on whether it is fair or unfair for 11:09:57
16 girls and women who are transgender to participate on
17 girls and women's sports teams; correct?

18 MR. FRAMPTON: Objection; form.

19 THE WITNESS: I have tried to focus on the
20 biological differences and how those differences 11:10:16
21 provide male advantages and how those differences are
22 not erased due to transgender identity or
23 gender-affirming hormone therapy. I have tried to not
24 give an opinion on fair versus unfair.

25 ///

1 BY MR. BLOCK:

2 Q Okay. And, you know, I apologize for being
3 persnickety in the phrasing of the question, but I want
4 to make sure that -- that -- that you're not answering
5 about what you're focusing on. I want to know whether 11:10:45
6 any evidence is going to be submitted in the form of an
7 expert opinion by you regarding fairness of girls and
8 women who are transgender participating in -- in girls
9 and women's sports.

10 So I'm just going to ask it again, and I would 11:11:05
11 just appreciate a "yes" or "no" answer, if you're
12 capable of giving it.

13 Are you providing an expert opinion in this
14 case regarding whether it is fair or unfair for girls
15 and women who are transgender to compete on girls and 11:11:18
16 women's sports teams?

17 MR. FRAMPTON: Objection; form, scope.

18 Go ahead.

19 THE WITNESS: I don't think I can answer that
20 as a yes-or-no question because the information 11:11:30
21 demonstrates that there's an advantage for biological
22 males. And so then we come to a question of fair,
23 which is a very challenging metaphysical question that
24 I would prefer others address.

25 ///

1 BY MR. BLOCK:

2 Q So you -- you are not an expert on whether it
3 is fair or unfair for girls and women who are
4 transgender to participate on girls and women's sports
5 teams?

11:12:01

6 MR. FRAMPTON: Objection; form.

7 THE WITNESS: I'm not a sports philosopher in
8 whom that field would fall into.

9 BY MR. BLOCK:

10 Q Right. Therefore, you are not providing an
11 expert opinion on whether it is fair or unfair for
12 girls and women who are transgender to participate on
13 girls and women's sports teams?

11:12:15

14 MR. FRAMPTON: Same objection.

15 THE WITNESS: As I've said, I've done my best
16 to try and stick to the data and not give my opinion on
17 what is fair or unfair.

11:12:25

18 BY MR. BLOCK:

19 Q I'm sorry, Dr. Brown, this -- this really
20 should be like a -- a simple question. Because when
21 you say "focus" and "I've tried to," that -- that's
22 just not answering my question. I just really need a
23 question (sic) on whether evidence is going to be
24 submitted in this case, from you, in the form of an
25 expert opinion under Federal Rules of Evidence 702 on

11:12:35

11:12:50

1 whether or not it is fair or unfair for girls and women
2 who are transgender to participate.

3 Regardless of whether it's your focus,
4 regardless of whether you're trying -- what you're
5 trying or not trying to do, I just need a "yes" or "no" 11:13:07
6 answer on whether you are providing an expert opinion
7 on the topic of fairness.

8 MR. FRAMPTON: Same objection.

9 THE WITNESS: So would you allow me a few
10 minutes to review the conclusions to my declaration? 11:13:21
11 Because I don't want to say something that is
12 contradictory to what I have said in what is submitted
13 as an expert declaration.

14 MR. BLOCK: All right. We can -- we can go
15 off the record, if you would like to do that right now. 11:13:38

16 Does counsel want to go off the record?

17 MR. FRAMPTON: No, we don't need to go off the
18 record. If he wants to review something, he can review
19 it.

20 MR. BLOCK: Well, I'm not taking time out from 11:13:47
21 the deposition for him to review what -- what his
22 expert opinions are in -- in this case.

23 So, you know, if he wants to do it during a
24 break, you know, you're welcome to, but you're not
25 using my deposition time to answer a simple question. 11:14:00

1 I mean, this witness should know what he's
2 providing an expert opinion on, so --

3 MR. FRAMPTON: And I think he's told you about
4 three times now, but again, I don't need to argue that
5 on the record. 11:14:13

6 BY MR. BLOCK:

7 Q But you know you're not providing an expert
8 opinion on whether it's fair or unfair for prepubertal
9 girls and boys in elementary school to play on coed or
10 mixed sports teams? 11:14:28

11 A I think I've already answered that question
12 with my statement about focusing on what the science is
13 saying on who has advantages.

14 Q All right. Are you qualified to offer an
15 expert opinion on fairness? 11:14:39

16 MR. FRAMPTON: Objection; form.

17 THE WITNESS: Who is a qualified expert to
18 offer an opinion on fairness?

19 BY MR. BLOCK:

20 Q I don't know. Are you? 11:14:53

21 MR. FRAMPTON: Same objection.

22 Go ahead.

23 THE WITNESS: I think I can offer fairness as
24 far as my understanding of what the policies and
25 procedures are that are set to determine what is fair 11:15:08

1 in sports.

2 BY MR. BLOCK:

3 Q Your personal opinion; right?

4 MR. FRAMPTON: Same objection.

5 THE WITNESS: No. For instance, there are a 11:15:27

6 lot of policies that specify the -- that use of

7 performance-enhancing substances are unfair, in which

8 that is something that I would teach in my sports -- my

9 sport nutrition class. Since I'm teaching it in a

10 class, I've been judged by my peers to be an expert on 11:15:41

11 that.

12 BY MR. BLOCK:

13 Q Okay. But are you qualified to offer an

14 expert opinion on whether it's fair or unfair for girls

15 and women who are transgender to compete in women's 11:15:50

16 sports?

17 MR. FRAMPTON: Same objection.

18 THE WITNESS: Am I qualified? Well, the

19 policies state that it is not fair. And so if I am

20 following the policy, I suppose I am an expert in that. 11:16:02

21 BY MR. BLOCK:

22 Q I don't understand what that means.

23 A So when I teach in my classes, in my field, in

24 my expertise, quite often we discuss and teach about

25 the policies on what is fair participation or unfair 11:16:20

1 participation. Since I'm teaching it and I'm judged by
2 my peers as an expert in it, then I would say I can
3 give an expert opinion on it.

4 Q Who -- who are -- who -- who judges you as
5 quali- -- what peers judge you as qualified to -- to 11:16:40
6 give an expert opinion on whether it's fair for girls
7 and women who are transgender to compete in girls and
8 women's sports?

9 A Well, my -- again, I've been accepted by my
10 peers as an expert to present on this topic, on the 11:16:59
11 participation and the physiological effects of
12 transgender individuals.

13 Q Right. My question was about fairness.
14 Have you been -- who, among your peers, have
15 said that you are qualified to opine on the fairness of 11:17:16
16 the participation of girls and women who are
17 transgender in -- in girls and women's sports?

18 A My colleagues at the university I work at,
19 administrators at the university I work at, they honor
20 my opinion. 11:17:35

21 Q I thought that your opinion in this matter
22 just reflects your own views, not the views of the
23 university; is that right?

24 A That is correct.

25 Q Okay. So what do you mean by -- when you say 11:17:43

1 that the university honors your opinion?

2 A They allow me to express my opinion, and they
3 recognize that it falls within my discipline and my
4 field and the scope of my professional expertise.

5 Q How did they recognize that? 11:18:03

6 A They've told me.

7 Q Who has told you?

8 A The athletic director, the -- one of the
9 senior vice chancellors, I can't remember her full
10 title, another one of the vice chancellors for academic 11:18:24
11 and student affairs.

12 Q Has any --

13 A Along -- along with some of my colleagues in
14 the department.

15 Q Did the university tell you to testify in this 11:18:32
16 case?

17 A The university did not tell me to or not to
18 testify in this case.

19 Q Okay. Did any of the -- your -- your
20 colleagues that honor your opinions, are any of them 11:18:43
21 experts in fairness?

22 MR. FRAMPTON: Objection; form.

23 THE WITNESS: Well, one of them is a -- I
24 guess his area would be sports sociology and sports
25 psychology and does a lot of work in the area of 11:19:03

1 policies and procedures for sports, so I would say that
2 he's probably an expert in fairness.

3 BY MR. BLOCK:

4 Q Have you been invited by any sort of
5 professional policymaking organizations to participate 11:19:15
6 in crafting policies?

7 A No, I have not.

8 Q Okay. Do you know whether West Virginia has
9 any laws or policies regarding sex-separated sports for
10 prepubertal children? 11:19:43

11 MR. FRAMPTON: Objection; form.

12 THE WITNESS: My understanding of the law that
13 we're meeting about now does specify that you
14 participate in sports based on biological sex.

15 BY MR. BLOCK: 11:19:57

16 Q Do you -- do you know whether West Virginia
17 has any laws or policies regarding the participa- --
18 let me say this again.

19 Do you know whether West Virginia has any laws
20 or policies regarding sex-separated sports in 11:20:13
21 elementary school?

22 MR. FRAMPTON: Objection; form.

23 THE WITNESS: If I recall correctly, this law
24 applies to elementary school.

25 ///

1 BY MR. BLOCK:

2 Q Would your opinions in this case change if you
3 were to learn that the law doesn't apply to elementary
4 school?

5 MR. FRAMPTON: Objection to form. 11:20:36

6 THE WITNESS: No, my opinion would not change
7 because there are biological differences between males
8 and females that give males an inherent athletic
9 advantage.

10 BY MR. BLOCK: 11:20:45

11 Q Do you think it's reasonable for a state to
12 say that it wants sex-separated teams beginning in
13 middle school, but not in elementary school?

14 MR. FRAMPTON: Objection; form.

15 THE WITNESS: I think it is reasonable since 11:21:06
16 most of the time younger children's leagues are
17 considered developmental and the children are not
18 competing for prizes or honors. A lot of times that
19 competition begins in middle or high school.

20 MR. BLOCK: Okay. That -- that's a great 11:21:24
21 lead-in to the next exhibit. So if you would give me a
22 second to make that happen.

23 (Exhibit 69 was marked for identification
24 by the court reporter and is attached hereto.)

25 ///

1 BY MR. BLOCK:

2 Q All right. Soon appearing in your folder will
3 be a document marked Exhibit 69. Let me know when
4 that's available.

5 Do you see it? 11:22:09

6 A Exhibit 69, Briefing Book, WSPWG?

7 Q Yes. And you cite to this document in your
8 report; right?

9 A Yes, I think I do.

10 Q Okay. Great. 11:22:21

11 If you could turn to footnote 2, I believe,
12 footnote 2, page 8 of the document.

13 Can you let me know when you get to that?

14 A Footnote 2, page 8 starts off with the word
15 "endocrinologists." 11:22:51

16 Q Yes.

17 A Yes.

18 Q Okay. If you look at what that footnote 2,
19 like, refers to, in the third paragraph, beginning with
20 "at the same time." 11:23:05

21 Do you see in the text "at the same time"?

22 A Sorry.

23 Q Yeah. Sure. The third paragraph from the top
24 of the page begin- --

25 A Oh, sorry. Sorry. Yes, I've got it. 11:23:19

1 Q Yeah. The second sentence of that paragraph,
2 it says (as read):
3 "Because the onset of male puberty -
4 normally around ages 11 - 12 in boys -
5 is the physical justification for 11:23:30
6 separate sex sport..."

7 And then that's what triggers the footnote 2;
8 correct?

9 A Yes.

10 Q Okay. And then footnote 2 says (as read): 11:23:39
11 "Endocrinologists explain that puberty
12 in boys should start between ages 9-13
13 and in girls between ages 8-12; that
14 puberty usually takes 4-5 years to
15 complete so that 95% of boys will have 11:23:53

16 started puberty by age 13. This
17 timing is consistent with the formal
18 position of the Women's Sports
19 Foundation providing that '[p]rior to
20 puberty, females and males should 11:24:05
21 compete with and against each other on
22 coeducational teams.'"

23 Did I read that correctly?

24 A Yes, you read that correctly.

25 Q Okay. And then it cites to a document from 11:24:21

1 the Women's Sports Foundation; correct?

2 A Yes.

3 Q Did you read that document?

4 A I cannot recall specifically if I've read that
5 or not. I think I probably did, but I can't recall. 11:24:29

6 Q Okay. And so you understand that it's the
7 position of the Women's Sports Foundation that prior to
8 puberty, females and males should compete with and
9 against each other on coeducational teams?

10 A Well, that is what is stated in this document. 11:24:51

11 Q Okay. Do you feel like you -- do you feel
12 that you are qualified to offer an expert opinion on
13 the fairness of elementary school kids participating on
14 coeducational teams?

15 MR. FRAMPTON: Objection; form. 11:25:08

16 THE WITNESS: I think I can offer information
17 on the differences in -- the -- the biological
18 differences between boys and girls and how that gives
19 boys an advantage in athletics.

20 BY MR. BLOCK: 11:25:23

21 Q Do you think the Women's Sports Foundation is
22 a better source of information than you on what
23 benefits prepubertal girls in athletic participation?

24 MR. FRAMPTON: Objection; form.

25 THE WITNESS: Can you rephrase that question? 11:25:40

1 BY MR. BLOCK:

2 Q Yeah, yeah.

3 Who -- who -- who do you think is a better
4 source of authority on -- on -- on -- on what is in the
5 best interest of prepubertal girls when it comes to 11:25:53
6 athletics, you or the Women's Sports Foundation?

7 MR. FRAMPTON: Objection; form.

8 THE WITNESS: I think this may be a situation
9 where I don't agree with the Women's Sports Foundation.

10 BY MR. BLOCK: 11:26:08

11 Q Okay. If you go back to -- to your report, on
12 page 4, page 4 of your report. It's not in numbered
13 paragraphs yet. And this is Exhibit 64, I believe.

14 A Okay. Page 4 where I have "Overview"?

15 Q Yes. 11:26:59

16 A All right.

17 Q In the first bullet point, you say (as read):
18 "At the level of (a) elite, (b)
19 collegiate, (c) scholastic, and (d)
20 recreational competition, men, 11:27:10
21 adolescent boys, or male children,
22 have an advantage over equally aged,
23 gifted, and trained women, adolescent
24 girls, or female children in almost
25 all athletic events." 11:27:19

1 Is that right?

2 A That is correct.

3 Q Okay. So do you think that -- that
4 prepubertal boys and prepubertal girls should not be
5 playing in competition with each other in recreational 11:27:34
6 events?

7 MR. FRAMPTON: Objection; form.

8 THE WITNESS: I think if they are competing
9 for prizes, for awards, the boys have an advantage.
10 BY MR. BLOCK: 11:27:45

11 Q And, therefore, they should not be competing
12 against each other for prizes and awards?

13 MR. FRAMPTON: Objection; form, scope.

14 THE WITNESS: I would say that if we are --
15 yeah, the boys should not be competing against the 11:28:06
16 girls if they're competing for prizes and awards.

17 BY MR. BLOCK:

18 Q Do you think that in the case of transgender
19 girls and women after puberty, do you think they should
20 not be allowed to play on recreational teams with 11:28:24
21 cisgender girls and women?

22 MR. FRAMPTON: Objection; form, scope.

23 THE WITNESS: I have concerns about the safety
24 of cisgender girls and women competing against
25 biologically male -- sorry -- trans women. 11:28:45

1 BY MR. BLOCK:

2 Q Do you think that cisgender girls and women
3 should be allowed to play on football teams with
4 biological boys?

5 MR. FRAMPTON: Objection; form, scope. 11:29:00

6 THE WITNESS: If the girls are informed of the
7 risks, then the girls should be able to make an
8 informed choice on that matter.

9 BY MR. BLOCK:

10 Q So you don't think it's the -- the -- safety 11:29:13
11 reasons should prohibit cisgender girls and women from
12 playing football with cisgender boys?

13 MR. FRAMPTON: Same objection.

14 THE WITNESS: If the girls would like to play
15 on the boys' team and they and their parents make an 11:29:28
16 informed choice that they're willing to accept those
17 risks, then I think that is up to them to choose.

18 BY MR. BLOCK:

19 Q Okay. And -- and do you think that cisgender
20 girls and women should be allowed to play on wrestling 11:29:42
21 teams with cisgender boys and men?

22 MR. FRAMPTON: Same objection.

23 THE WITNESS: I would say the same statement,
24 if they are aware of the inherent risks and recognize
25 the advantages that males have, they can make that 11:29:56

1 choice.

2 BY MR. BLOCK:

3 Q Going back to recreational competition, do you
4 think that transgender girls and women should not be
5 allowed to play recreational sports on girls and 11:30:07
6 women's teams if the sport is a noncontact or collision
7 sport?

8 MR. FRAMPTON: Same objection.

9 THE WITNESS: If it is a women's league, then
10 that should be limited to biological women. 11:30:25

11 BY MR. BLOCK:

12 Q Even if they're not competing for prizes?

13 MR. FRAMPTON: Same objection.

14 THE WITNESS: Can I walk through this for just
15 a minute? 11:30:37

16 BY MR. BLOCK:

17 Q Sure.

18 A Oh. So if women are signing up for a women's
19 recreational league, I think they do so with the
20 expectation they will be playing -- and even if it's 11:30:47
21 not competing for prizes, but they are competing --
22 with other women. And so introducing a trans woman is
23 not fair to the women that have said that they are
24 competing against biological women.

25 Q Why isn't it fair if they're not competing for 11:31:04

1 prizes?

2 MR. FRAMPTON: Same objection.

3 THE WITNESS: Well, if they are competing --
4 even if it's not prizes, they are competing.

5 BY MR. BLOCK: 11:31:21

6 Q What if they're just -- just participating
7 together for recreational purposes?

8 MR. FRAMPTON: Objection; form.

9 THE WITNESS: Then I think that the cisgender
10 women still need to be fully informed of whether there 11:31:38
11 will be trans women or not, and then they could make
12 their choice on a recreational pickup game type of
13 play.

14 BY MR. BLOCK:

15 Q Okay. If -- how about riflery, should 11:31:47
16 transgender girls and women be allowed to play on a
17 recreational riflery league with cisgender girls and
18 women?

19 MR. FRAMPTON: Objection; form and scope.

20 THE WITNESS: Once again, if they are just out 11:32:14
21 shooting for fun and they're not competing and the
22 recognition is that it is not exclusively a women's
23 event. All of those need to be considered.

24 BY MR. BLOCK:

25 Q Do you think transgender girls and women have 11:32:28

1 an athletic advantage over cisgender girls and women
2 when it comes to riflery?

3 MR. FRAMPTON: Objection; form and scope.

4 THE WITNESS: Yes, I do think that transgender
5 girls and women have an advantage over cisgender girls 11:32:41
6 and women because you still have to hold the rifle, you
7 still have to feel the recoil, and a larger individual
8 will have less felt recoil.

9 BY MR. BLOCK:

10 Q So in terms of recreational activities, if a 11:33:16
11 policy said that transgender girls and women can't
12 compete in, you know, championship competition but can
13 compete on recreational teams with cisgender girls and
14 women and that policy is well known, is it your
15 position that transgender girls and women should still, 11:33:43
16 you know, not be allowed to compete on the -- to
17 participate on those recreational teams with cisgender
18 girls and women?

19 MR. FRAMPTON: Objection; form and scope.

20 THE WITNESS: It's kind of a long, complicated 11:33:57
21 question. Can you simplify it for me?

22 BY MR. BLOCK:

23 Q Well, your -- your answer on recreational
24 teams was that you want the cisgender people to be
25 informed that a transgender person might be there. 11:34:12

1 A Because --

2 MR. FRAMPTON: Same objection.

3 Go ahead.

4 THE WITNESS: Because they want to know who

5 they're competing against and because of our 11:35:29

6 longstanding policy of sex-segregated sports, they want

7 to know if they're playing on a coed team or a

8 sex-segregated team.

9 BY MR. BLOCK:

10 Q When you say your experience tells you that 11:35:42

11 women would like to know that, what experience?

12 A Talking with friends and family members,

13 students, colleagues, those types of things.

14 MR. BLOCK: So I -- I am going to another

15 section. I'm happy to continue going, unless you need 11:36:13

16 a -- a break.

17 THE WITNESS: I need a bathroom break.

18 MR. BLOCK: Sure. See you in five minutes.

19 THE WITNESS: All right. Thanks.

20 THE VIDEOGRAPHER: We are off the record at 11:36:24

21 11:36 a.m.

22 (Recess.)

23 THE VIDEOGRAPHER: We are on the record at

24 11:47 a.m.

25 MR. BLOCK: Great. 11:47:20

1 BY MR. BLOCK:

2 Q Dr. Brown, during the break, did you have a
3 chance to review your expert report to determine
4 whether you're offering an opinions on fairness?

5 MR. FRAMPTON: Objection; form. 11:47:30

6 THE WITNESS: I didn't take advantage of that
7 time to look at that.

8 MR. BLOCK: Okay. I'm going to mark another
9 exhibit here. So this -- this exhibit, which will
10 appear shortly, is going to be marked as Exhibit 70. 11:47:58

11 (Exhibit 70 was marked for identification
12 by the court reporter and is attached hereto.)

13 BY MR. BLOCK:

14 Q Please let me know when it's up on your
15 screen. 11:48:05

16 A All right. Exhibit 70, 070 - 2021.

17 Q Yes. Can you tell me -- well, first of all,
18 have you ever seen this document?

19 A You know, I can't promise that I have seen
20 this document. 11:48:38

21 Q Okay. What does -- this is a document -- I've
22 got to scroll back up to page 1 of this document
23 myself.

24 This document is a transcript of hearings
25 in -- in the Pennsylvania house of representatives on 11:48:56

1 H.B. 972, Fairness in Women's Sports Act.

2 Is that -- do you agree that's what this
3 document appears to be?

4 A Yes, that appears to be a transcript of a
5 hearing on that. 11:49:14

6 Q Okay. And that hearing was on August 4th,
7 2021; correct?

8 A That's what it says.

9 Q Okay. And do you remember providing testimony
10 as part of this hearing? 11:49:24

11 A I do remember providing testimony for that.

12 Q Okay. Terrific.

13 If you can go to page 15.

14 A Sorry. It's loading slowly. As I scroll, I
15 have to wait for the page to load. 11:49:54

16 Q Yeah. No, I -- I appreciate that.

17 A Okay. Page 15?

18 Q Yes.

19 A Starts off "Biological sex confers"?

20 Q Yeah. 11:50:03

21 A Okay.

22 Q "Biological" -- I'm just going to read it into
23 the record. (As read):

24 "Biological sex confers inherent
25 athletic advantages to human males 11:50:09

1 compared to human females such that
2 even before puberty, males have
3 10 percent more muscle mass, less body
4 fat, larger hearts and lungs, denser
5 bones, and other anatomical and 11:50:20
6 physiological traits that give males
7 inherent athletic advantages over
8 comparably aged and trained females."

9 Did I read that right?

10 A Yes. 11:50:31

11 Q And do you recall giving that testimony?

12 A Yes.

13 Q Is it true that -- that prepubertal boys have
14 denser bones than prepubertal girls?

15 A I would need to look back at my research 11:50:50
16 that -- you know, the papers that I've read to see on
17 that.

18 Q Okay. Is it -- is it true that prepubertal
19 boys have larger hearts and lungs than prepubertal
20 girls? 11:51:01

21 A They have larger lungs. And again, I would
22 want to refer back to my research on the larger hearts.

23 Q Okay. Now, if you go to page 16.

24 A Okay.

25 Q Actually, go to page 17, line 3. 11:51:31

1 You say (as read):
2 "And a male to female individual will
3 never experience nor need to learn how
4 to cope with menstrual-cycle
5 challenges, whereas 50 to 71 percent 11:51:49
6 of female athletes expressed concerns
7 that their menstrual cycle may
8 influence their physical performance."

9 Did I read that right?

10 A Yes, you did. 11:52:03

11 Q So is it your testimony that one advantage
12 that transgender girls and women have over cisgender
13 girls is that they don't have to worry about their
14 menstrual-cycle concerns?

15 MR. FRAMPTON: Objection to the form and 11:52:09
16 scope.

17 Go ahead.

18 THE WITNESS: Yes, that is what I said in this
19 situation in Philadelphia.

20 BY MR. BLOCK: 11:52:16

21 Q Okay. Do you --

22 A Sorry, Harrisburg.

23 Q Okay. Are you offering that opinion in this
24 case?

25 A I did not include that opinion in my written 11:52:23

1 statement for this case.

2 Q Okay. Are you offering that opinions now in
3 this case?

4 A I would offer that opinions now.

5 Q Okay. And -- so do you think that cisgender 11:52:33
6 girls who are not menstruating have an advantage over
7 cisgender girls who do menstruate?

8 MR. FRAMPTON: Objection; form, scope.

9 THE WITNESS: So the research regarding the
10 effects of the menstrual cycle on athletic performance 11:52:53
11 are very difficult and very confusing and some
12 instances so -- show that phase of the menstrual cycle
13 influence a performance, some do not.

14 But as I stated there, depending on which
15 survey you're looking at, 50 to 71 percent of female 11:53:11
16 athletes are concerned that their menstrual cycle will
17 negatively impair their performance.

18 BY MR. BLOCK:

19 Q Okay. Do you think we should have separate
20 teams for girls and women who menstruate and girls and 11:53:22
21 women who don't?

22 MR. FRAMPTON: Same objection.

23 THE WITNESS: No, I do not.

24 BY MR. BLOCK:

25 Q Why not? 11:53:36

1 A Because they're all biologically female.

2 Q Even though some of them would have the
3 advantage of not having to worry about their menstrual
4 cycle; is that right?

5 MR. FRAMPTON: Same objection. 11:53:46

6 THE WITNESS: Again, what -- can you please
7 rephrase that?

8 There were some questions -- some statements
9 in there that were more absolute than I'm comfortable
10 answering. 11:54:00

11 BY MR. BLOCK:

12 Q Okay. So despite the fact that cisgender
13 girls and women who don't menstruate don't have to
14 worry about how their menstrual cycle will affect
15 athletic performance, you think that it's still fair 11:54:13
16 for girls and women who menstruate to participate on
17 the same sports teams as girls and women who don't
18 menstruate; correct?

19 MR. FRAMPTON: Objection; form and scope.

20 THE WITNESS: So when you're talking about 11:54:30
21 menstruate, I want to make sure we're on the same page
22 here.

23 Do you mean they have lost having their
24 menstrual cycle?

25 ///

1 BY MR. BLOCK:

2 Q I -- you know, I -- some -- that -- that could
3 be one thing. Some -- some girls and women who are cis
4 don't have a menstrual cycle.

5 So for whatever reason, a cisgender girl and 11:54:58
6 women who do not menstruate, should they be playing on
7 different teams from girls and women who do menstruate?

8 MR. FRAMPTON: Objection; form and scope.

9 THE WITNESS: So loss of the menstrual cycle
10 is generally a negative connotation for a woman in 11:55:15
11 terms of athletic performance. It would indicate
12 somewhere progressing on the female athlete triad. And
13 so they're still biological women. They should still
14 be on the women's team.

15 BY MR. BLOCK: 11:55:39

16 Q So is it really relevant one way or another
17 whether or not someone is menstruating to their
18 athletic performance?

19 MR. FRAMPTON: Same objection.

20 THE WITNESS: Again, 50 to 71 percent of 11:55:47
21 female athletes are concerned that their menstrual
22 cycle will influence their physical athletic
23 performance.

24 BY MR. BLOCK:

25 Q So is it relevant to their athletic 11:56:01

1 performance whether or not someone is menstruating?

2 MR. FRAMPTON: Same objection.

3 THE WITNESS: For some women, it is. For some
4 women, it is not.

5 BY MR. BLOCK: 11:56:21

6 Q In your report, you refer, several times, to
7 something called "puberty blockers"; right?

8 A Yes.

9 Q Okay. So I want to make sure that we're using
10 the same terminology when we're using that phrase. 11:56:34

11 When I use the phrase "puberty blockers," I'm
12 referring to gonadotropin-releasing hormone analogues.

13 Is that consistent with your understanding of
14 the term "puberty blockers"?

15 A I know the gonadotropin-releasing hormone. I 11:56:53
16 cannot remember if the word is "analogues" or
17 "antagonists" or "agonists."

18 Q Okay. So GR- --

19 A GnR- -- yes.

20 Q I'm sorry, can you say that again? 11:57:06

21 A Yeah. G-N-R-H-As. And again --

22 Q So --

23 A -- I cannot remember specifically what the A
24 stands for.

25 Q So -- so it's your understanding that the term 11:57:13

1 "hormone blockers" refers to GnRHa's; correct?

2 A Puberty blockers.

3 Q Sorry. Puberty blockers.

4 It's your understanding that the term "puberty

5 blocker" refers to the GnRHa's; correct? 11:57:27

6 A That is correct.

7 Q Okay. Great.

8 If we go to paragraph 110 of your report --

9 again, that's Exhibit 64. Let me know when you're --

10 when you get there. 11:57:39

11 A Paragraph 110 is what I'm headed for?

12 Q Yep.

13 A All right. Paragraph 110, page 36.

14 Q Great. So in paragraph 110, you say -- if you
15 go, like -- one, two, three, four -- five lines down, 11:58:18

16 after the parenthetical number 9, you say (as read):

17 "While it is outside my expertise, my

18 understanding is that current practice

19 with regard to administration of

20 puberty blockers is similar in the 11:58:33

21 United States."

22 I think you're referring to as in the UK; is

23 that correct?

24 A Yes.

25 Q Okay. And then you say (as read): 11:58:43

1 "Tanner stages 2 and 3 generally
2 encompass" --
3 You say "an range," but I think you mean "a
4 range" -- sorry -- "a age range" -- no, I messed that
5 up. I'll say that again. I apologize for inserting an 11:59:00
6 error into your -- your sentence.

7 You say (as read):
8 "Tanner stages 2 and 3 generally
9 encompass an age range from 10 to 14
10 years old, with significant 11:59:07
11 differences between individuals."

12 And then you go on to say that you're not
13 aware of research directly addressing the implications
14 for athletic capability of the use of puberty blockers.
15 So, you know, my question is, when you wrote 11:59:24
16 that paragraph, did you think it -- did you consult the
17 Endocrine Society guidelines that we had previously
18 discussed?

19 MR. FRAMPTON: Objection to form.
20 THE WITNESS: I cannot recall if I 11:59:45
21 specifically looked at the Endocrine Society guidelines
22 as I was writing that. As I -- as I said, "as I
23 recall," I think, is the wording I used.

24 BY MR. BLOCK:
25 Q Okay. Did you make any effort to determine 11:59:57

1 what the -- the practice in the United States is with
2 regard to administering puberty blockers?

3 MR. FRAMPTON: Objection; form.

4 Go ahead.

5 THE WITNESS: Well, there's the 12:00:13

6 Endocrine Society guidelines, but those are not
7 specific to the United States, if I recall, and so I --

8 BY MR. BLOCK:

9 Q Right.

10 A -- don't know of a specific United States 12:00:22

11 policy compared to the UK policy. I think it's more of
12 a this is the policy.

13 Q Yeah, got it.

14 But did you make any effort to determine what
15 the practice is in the United States? 12:00:35

16 A I'm -- yes, I know I did look into it.

17 Q How? How did you look into it?

18 A Reading scholarly literature on the topic to
19 see what it says. Looking at web pages on the topic.

20 Q So -- so you read scholarly literature and web 12:00:57

21 pages on the topic and you couldn't determine whether
22 the practice in the United States is to administer
23 puberty blockers at Tanner II versus Tanner III?

24 MR. FRAMPTON: Objection; form.

25 THE WITNESS: As I said there, my -- that is 12:01:16

1 outside my scope of my expertise, and so I don't want
2 to be construed as saying this is the policy. So I was
3 trying to make sure that I was not giving specific
4 medical advice on when someone should be administering
5 puberty blockers. 12:01:32

6 BY MR. BLOCK:

7 Q If you submitted an article to a peer-reviewed
8 journal and it included a sentence saying "while it is
9 outside my expertise, my understanding is that," you
10 know, and then the sentence continued, do you think 12:01:48
11 that type of statement would be accepted in a
12 peer-reviewed article?

13 A It would need to be taken in the context of
14 the type of article. And some reviewers would find it
15 acceptable because -- acknowledging what I don't know, 12:02:06
16 and others would say perhaps not.

17 Q Do you think that your expert report in this
18 case should be held to the same standards that a
19 peer-reviewed article would be held to?

20 MR. FRAMPTON: Objection; form, scope. 12:02:21

21 THE WITNESS: No, this is not held in the same
22 standards of a peer-reviewed article.

23 BY MR. BLOCK:

24 Q Why not?

25 A This is written for a different audience. 12:02:31

1 Q So why -- why should it not be held to the
2 same standards?

3 MR. FRAMPTON: Objection; form and scope.

4 THE WITNESS: Once again, this is written for
5 a different audience. This is not written for the 12:02:48
6 other experts in the field. This is written to provide
7 information to policymakers and in a legal situation
8 like this.

9 BY MR. BLOCK:

10 Q Well, but do you think that the -- regardless 12:02:58
11 of the style in which something is written, do you
12 think the same underlying rigor should be required for
13 an expert report as a peer-reviewed article?

14 MR. FRAMPTON: Objection; form and scope.

15 THE WITNESS: No, an expert report is not 12:03:17
16 going to be held to the same rigor as a peer-reviewed
17 article.

18 BY MR. BLOCK:

19 Q Okay. So you -- do you think that the
20 opinions expressed in an expert report don't have to be 12:03:27
21 as reliable as the opinions expressed in a
22 peer-reviewed article?

23 MR. FRAMPTON: Objection; form and scope.

24 THE WITNESS: The opinions in an expert report
25 need to be accurate, they need to be correct. 12:03:43

1 BY MR. BLOCK:

2 Q Yeah, but that wasn't my question.

3 Can you answer my question, please?

4 A Can you restate my your question, please?

5 MR. BLOCK: Could the reporter read back my 12:03:50
6 question?

7 THE REPORTER: Yes.

8 (Record read.)

9 MR. FRAMPTON: Objection; form and scope.

10 THE WITNESS: Generally, in a peer-reviewed 12:04:16
11 article, you are not providing opinions; you are
12 summarizing literature. And that's primarily what I've
13 done here, is summarize literature.

14 BY MR. BLOCK:

15 Q Do you think the accuracy of the -- of your 12:04:26
16 summaries in an expert report should be held to the
17 same standard as the accuracy of summaries in a
18 peer-reviewed article?

19 MR. FRAMPTON: Objection; form and scope.

20 THE WITNESS: The information needs to be 12:04:43
21 correct, accurate, truthful.

22 MR. BLOCK: Can you read back my question,
23 Reporter?

24 (Record read.)

25 MR. FRAMPTON: Objection; form and scope. 12:05:06

1 THE WITNESS: I thought I answered that by
2 saying it needs to be accurate and correct and
3 truthful.

4 BY MR. BLOCK:

5 Q Can you answer the question? 12:05:13

6 I -- I asked -- give me a "yes" or "no"
7 answer, please.

8 MR. FRAMPTON: Same objection.

9 THE WITNESS: I don't know that this is really
10 a yes-or-no question. 12:05:25

11 BY MR. BLOCK:

12 Q Are there different standards of accuracy for
13 an expert report than for a peer-reviewed article?

14 MR. FRAMPTON: Objection; form and scope.

15 THE WITNESS: They both need to be accurate 12:05:45
16 and correct. The writing style is so phenomenally
17 different.

18 BY MR. BLOCK:

19 Q All right. But they -- but the accuracy needs
20 to be the same; correct? 12:05:58

21 MR. FRAMPTON: Same objection.

22 THE WITNESS: Yes, they need to be accurate
23 and correct.

24 BY MR. BLOCK:

25 Q Okay. Is it fair to say that you did not 12:06:03

1 approach the task of writing this report with the same
2 analytical rigor that you would have approached the
3 task of writing a peer-reviewed article?

4 MR. FRAMPTON: Objection; form and scope.

5 THE WITNESS: That would not be a correct 12:06:16
6 statement.

7 BY MR. BLOCK:

8 Q Okay. Would you be comfortable submitting the
9 opinions that you expressed in this report in a
10 peer-reviewed article? 12:06:26

11 A Yes, I would be comfortable submitting them in
12 a peer-reviewed article.

13 Q Okay. If we could go back to your report, to
14 paragraph 111. So your report is Exhibit 64.

15 A So paragraph 111 starts "Tack et al." 12:06:50

16 Q Yes, it does.

17 It says (as read):

18 "Tack et al. (2018) observed that in
19 21 transgender-identifying biological
20 males, administration of antiandrogens 12:07:02
21 for 5-31 months (commencing at 16.3 ±
22 1.21 years of age)" --

23 And then I think it says "age" again in
24 parentheses. Or -- or is that just in my copy? I'm
25 sorry. I -- this is the second time I've -- I've 12:07:17

1 introduced an error into your words, so I will start
2 that over again.

3 (As read):

4 "111. Tack et al. (2018) observed
5 that in 21 transgender-identifying 12:07:31
6 biological males, administration of
7 antiandrogens for 5-31 months
8 (commencing at 16.3 ± 1.21 years of
9 age) resulted in nearly, but not
10 completely, halting of normal 12:07:45
11 age-related increases in muscle
12 strength."

13 Okay. Did I read that correctly?

14 A Yes, you did.

15 MR. BLOCK: All right. Sorry for the error 12:07:54
16 the first time around.

17 So I'm going to introduce an exhibit now.

18 Okay. And so this exhibit, when it -- when it
19 pops up in your folder, will be marked Exhibit 71.

20 (Exhibit 71 was marked for identification 12:08:26
21 by the court reporter and is attached hereto.)

22 BY MR. BLOCK:

23 Q Can you please let me know when you see it.

24 A All right. Exhibit 71.

25 Q All right. Is that -- is this the Tack 12:08:41

1 article that you are referring to?

2 A Yes, it is.

3 Q Okay. Great.

4 So do you think this article is relevant to
5 the discussion about whether transgender girls who 12:08:53
6 receive puberty blockers have an athletic advantage
7 over cisgender girls?

8 A Yes, I think it is relevant.

9 Q Okay. Now, if you remember the conversation
10 we had a few minutes ago, we agreed that puberty 12:09:06
11 blockers referred to -- refers to GnRHa's; correct?

12 A That is correct.

13 Q Okay. Did any of the transgender girls in the
14 study receive GnRHa's?

15 A Not as I recall. 12:09:22

16 Q In fact, the transgender girls in the study
17 actually received a different type of hormone
18 medication called progestins; isn't that right?

19 A That is correct.

20 Q So this isn't actually a study about puberty 12:09:43
21 blockers, is it?

22 MR. FRAMPTON: Objection; form.

23 THE WITNESS: I never said this was a study
24 about puberty blockers.

25 ///

1 BY MR. BLOCK:

2 Q Why did you include this paragraph in a
3 discussion about the effects of puberty blockers?

4 A Well, I clarified, in this paragraph, that
5 they were using antiandrogens. Because as the authors 12:10:05
6 have stated on page 2148 (as read):

7 This will contribute to determining
8 the place of GnRHa and progestins,
9 respectively, in the pharmacological
10 treatment of trans youth and to 12:10:20
11 improving our knowledge on the
12 long-term effects of these
13 interventions, as has been suggested
14 recently.

15 And then they cite a source. 12:10:27

16 Q So in paragraph 110 of your report, you begin
17 a discussion about the effects of puberty blockers on
18 athletic performance; correct?

19 A Let me refer back to -- just to make sure
20 we've got the right paragraph number there. 12:10:47

21 Paragraph 110. Yes, that paragraph does bring
22 up the idea of puberty suppression and puberty
23 blockers.

24 Q Okay. And then in paragraph 111, you discuss
25 this article by Tack; correct? 12:11:22

1 A That is correct.

2 Q And then in paragraph 112, you say (as read):

3 "Klaver et al. (2018 at 256)

4 demonstrated that the use of puberty

5 blockers did not eliminate the 12:11:37

6 differences in lean body mass between

7 biological male and female teenagers."

8 Correct?

9 A That is correct.

10 Q And then paragraph 113, again, begins with the 12:11:44

11 words "the effects of puberty blockers"; isn't that

12 right?

13 A That is correct.

14 Q Okay. So paragraph 110, 112 and 113 are all

15 discussing the effects of puberty blockers; correct? 12:11:55

16 A Yes.

17 Q And -- but paragraph 111, which is in between

18 110 and 112, is describing a study that does not

19 involve puberty blockers; correct?

20 MR. FRAMPTON: Objection; form. 12:12:15

21 THE WITNESS: That's correct.

22 BY MR. BLOCK:

23 Q Do you think that someone reading your report

24 could form the false impression that this article in

25 fact discusses puberty blockers when in reality it 12:12:24

1 doesn't?

2 MR. FRAMPTON: Objection; form.

3 THE WITNESS: If someone is reading it and
4 pays attention to the statement of antiandrogens, they
5 would know that those are not puberty blockers. 12:12:35

6 BY MR. BLOCK:

7 Q Do you -- I thought you said recently that
8 this report is not meant for an audience of experts in
9 the field; right?

10 MR. FRAMPTON: Objection; form. 12:12:46

11 THE WITNESS: That is correct.

12 BY MR. BLOCK:

13 Q Okay. So do you think a lay audience, not of
14 experts in the field, would immediately understand that
15 antiandrogens are different from puberty blockers in 12:12:58
16 the context of this discussion?

17 MR. FRAMPTON: Objection; form.

18 THE WITNESS: So that's a difficult question
19 for me to answer because as I read through it, I notice
20 paragraph 110, puberty blockers, 112, -13, -14, all 12:13:13
21 specifically state puberty blockers, 111 states
22 antiandrogens. As I read that, as a critical thinker,
23 I would then say, well, why does this say antiandrogens
24 rather than puberty blockers and what -- learn the
25 difference. 12:13:32

1 BY MR. BLOCK:

2 Q So why does a paragraph in your report, in the
3 middle of discussing puberty blockers, talk about
4 antiandrogens at all?

5 A Because, to the best of my knowledge, that is 12:13:43
6 the only research that is out there on the effects of
7 transgender hormone treatment in teenagers on muscle
8 strength.

9 Q I see. But wouldn't it be better to include
10 that article in the subsequent sections of your report 12:14:01
11 that discuss the effect of suppressing testosterone?

12 MR. FRAMPTON: Objection; form.

13 THE WITNESS: I think this is a matter of
14 opinion. I think it fits well because this is focusing
15 on transgender youth. 12:14:17

16 BY MR. BLOCK:

17 Q Oh, okay. So your -- your testimony is this
18 section of the article is supposed to address the topic
19 of transgender youth in general and not the topic of
20 puberty suppression. Is that your testimony? 12:14:32

21 A No. My testimony is this is about transgender
22 youth, including puberty suppression, and what we know
23 on the topic of transgender youth and how it would
24 affect athletic performance.

25 Q I see. Let's go to the beginning of this 12:14:49

1 section, which is several pages up. It's a long
2 section. But the section begins on page 28 of your
3 report. 23 on the bottom pagination, 28 of the PDF.
4 And paragraph 68.

5 A All right. 12:15:28

6 Q Okay. So beginning with paragraph 68, you are
7 discussing -- oh, sorry. I -- can we just go a little
8 further down, to subsection A? I skipped over it
9 myself. So this is actually paragraph 71.

10 A Okay. 12:15:55

11 Q Thank you.

12 So subsection A (as read):

13 "Boys exhibit advantages in athletic
14 performance even before puberty."

15 Did I correctly read that that's the 12:16:04
16 subsection?

17 A Yes, that is correct.

18 Q Okay. And then, you know, if you -- if you
19 continue scrolling, you can take your time, it's a
20 bunch of paragraphs on, you know, physiological 12:16:14
21 characteristics before puberty, athletic performance
22 before puberty; correct?

23 A Yes.

24 Q All right. And if you keep -- keep scrolling,
25 I think all the way until we get to -- I -- I believe 12:16:31

1 it's paragraph 110.

2 A Yes.

3 Q All right. So for all these paragraphs until
4 110, you've been discussing characteristics of boys
5 before puberty; correct? 12:16:53

6 A Yes. The athletic differences and
7 physiological differences between biolo- -- between
8 boys and girls before puberty.

9 Q Okay. And then in paragraph 110, you say (as
10 read): 12:17:03

11 "For the most part, the data I review
12 above relate to pre-pubertal children.

13 Today, we also face the question of
14 inclusion in female athletics of males
15 who have undergone 'puberty 12:17:13

16 suppression.'"

17 Isn't that right?

18 A Yes.

19 Q Okay. So what connects paragraph 110 to
20 everything that came before it, as I understand it, is 12:17:22

21 that it's supposed to provide information on athletic
22 performance and advantages of what you call biological
23 males who have not experienced endogenous, typically
24 male, puberty yet; correct?

25 MR. FRAMPTON: Objection; form. 12:17:49

1 THE WITNESS: Yes, so if I understand what
2 you're referring to there, there's a lot of paragraphs
3 there about the differences between males and females
4 before puberty.

5 BY MR. BLOCK: 12:18:02

6 Q Right. Okay.

7 And so -- and what thematically connects that
8 to puberty blockers is that -- the argument is that
9 girls who are transgender and on puberty blockers never
10 experience, typically, male puberty; correct? 12:18:15

11 MR. FRAMPTON: Same objection. Objection to
12 form.

13 THE WITNESS: Can you state that again,
14 please?

15 BY MR. BLOCK: 12:18:25

16 Q Yeah. So transgender girls on hormone
17 blockers never experience, typically, male puberty if
18 they begin the blockers at stage Tanner II; is that
19 right?

20 MR. FRAMPTON: Objection; form, scope. 12:18:39

21 THE WITNESS: That is my understanding.

22 BY MR. BLOCK:

23 Q Okay. And so that's thematically what
24 connects the discussion of prepubertal kids to the
25 discussion of trans girls on puberty blockers; correct? 12:18:52

1 MR. FRAMPTON: Objection; form.

2 THE WITNESS: So what you're saying is there's
3 kind of a rough transition there?

4 BY MR. BLOCK:

5 Q Well, I -- I'm saying that -- I'm just asking 12:19:04
6 why are they in the same subsection that discusses
7 biological males before puberty?

8 A Well, because the puberty blockers would halt
9 puberty. That is the purpose of them.

10 Q Exactly. So this then leads to my question of 12:19:24
11 why do you then have a paragraph discussing
12 antiandrogens administered, you know, near the end of
13 puberty?

14 MR. FRAMPTON: Objection; form.

15 THE WITNESS: Because that is the only 12:19:42
16 information we have on teenagers and how their gender
17 treatment of hormones would be influenced.

18 If you look at some of those previous tables
19 and the tables in the appendix that go along with that,
20 they go up to 17-year-old children. 12:19:57

21 BY MR. BLOCK:

22 Q Right. But the -- the subsection is talking
23 ability prepubertal children; right?

24 MR. FRAMPTON: Objection; form.

25 THE WITNESS: That is the primary focus of 12:20:06

1 that subjection, yes.

2 BY MR. BLOCK:

3 Q Okay. And the -- the teenagers discussed in
4 the Tack study are not prepubertal teenagers; correct?

5 A That's correct. They are mid-prepubertal. 12:20:26

6 Q All right. Well, now let's look at
7 paragraph 112 of your report which discusses a 2018
8 study by Klaver.

9 Is that your understanding of how to pronounce
10 the name Klaver? 12:20:41

11 A Yes, that is my understanding of how to
12 pronounce the name. Thanks for asking.

13 MR. BLOCK: Okay. Great. And please feel
14 free to correct me if I pronounce anyone else's name
15 incorrectly. 12:20:54

16 All right. I'm going to introduce an exhibit.
17 This exhibit, when it appears on your screen, is going
18 to be marked as Exhibit 72.

19 (Exhibit 72 was marked for identification
20 by the court reporter and is attached hereto.) 12:21:14

21 BY MR. BLOCK:

22 Q Please let me know when it's visible.

23 A Exhibit 072 - Klaver - Early Hormonal
24 Treatment...

25 Q Right. And is this the article that you're 12:21:28

1 referring -- that you are referring to in
2 paragraph 112?

3 A I think so. Without double-checking between
4 my references cited, I -- I think this is the same
5 article. 12:21:46

6 Q Okay. Is it your understanding that the
7 people in this study received puberty blockers at the
8 beginning of Tanner II?

9 A As I recall, they received puberty blockers,
10 and I cannot recall the Tanner stage. I remember it 12:22:06
11 giving the ages.

12 Q Okay. What -- what age?

13 A Average age of fourteen and a half, if I
14 remember correctly.

15 Q Okay. And is fourteen and a half typically 12:22:15
16 the beginning of Tanner stage II?

17 A Not typically.

18 Q Okay. So if you go to page 254 of the Klaver
19 study --

20 A 2-5-4, yes. 12:22:37

21 Q All right. 2-5-4.

22 And if you look at the column that says

23 "Transwomen," it says (as read):

24 "Age at start of GnRHa, 14.5 ± 1.8."

25 Is that right? 12:22:59

1 A Yes.

2 Q Okay. And so accord- -- so with those
3 figures, that means that the earliest that any of the
4 trans girls in the study received puberty blockers was
5 at age 12.7; correct? 12:23:14

6 A Do you want me to take the time to do the math
7 on that?

8 Q Well, 14.5 minus 1.8 is 12.7, but --

9 A So that's only one standard deviation. That
10 only accounts for, basically, a third of the 12:23:37
11 individuals below and above that age. So take out
12 another 1.8 to get two standard deviations away.

13 Q Got it.

14 A And you take they way that 1.8 again to
15 encompass the whole 99.99 percent. 12:23:50

16 Q Oh, okay. So what's your understanding of the
17 youngest age at which someone -- the girls in the study
18 receive puberty blockers, just -- if you can do it
19 or -- without --

20 A Just eyeball it. I'll say 10.7. 12:24:04

21 Q Okay. Thank you.

22 But the average age is 14.5; right?

23 A That is the average age, yes.

24 Q Okay. Great.

25 Now, you see in paragraph 112 of your report, 12:24:14

1 which -- let me pull it up directly so I don't misread
2 it again.

3 Paragraph 112 of your report, the first
4 sentence you say (as read):

5 "Klaver et al. (2018 at 256) 12:24:29
6 demonstrated that the use of puberty
7 blockers did not eliminate the
8 differences in lean body mass between
9 biological male and female teenagers."

10 Did I read that right? 12:24:40

11 A I'm still getting to 112, sorry.

12 That -- that -- that sounds correct, but I'm
13 not --

14 Q Right.

15 A -- there to verify. 12:24:49

16 All right. Now I'm at 112.

17 Q Okay. I'll read it again. (As read):

18 "Klaver et al. (2018 at 256)
19 demonstrated that the use of puberty
20 blockers did not eliminate the 12:25:03
21 differences in lean body mass between
22 biological male and female teenagers."

23 Did I read that sentence right?

24 A Yes.

25 Q Okay. And then it says (as read): 12:25:09

1 "Subsequent use of puberty blockers
2 combined with cross-sex hormone use
3 (in the same subjects) still did not
4 eliminate the differences in lean body
5 mass between biological male and 12:25:19
6 female teenagers."

7 Is that right?

8 A Yes.

9 Q Okay. Great.

10 Did Klaver report any findings on percentage 12:25:26
11 of body fat?

12 A Let me look.

13 Yes.

14 Q And -- and what were the findings on -- on
15 body fat? 12:25:45

16 A Just looking at it to make sure I'm reading
17 these correctly.

18 So it gives -- this is table -- or, sorry,
19 figure 2. At the top of figure 2, there is percent
20 body fat presented. 12:26:08

21 Q Yep. And the first part of that graph,
22 page 256, table 2, shows the percent body fat of the
23 trans women being virtually the same as the body fat of
24 the cis women; correct?

25 A Sorry, how do you zoom on this Exhibit Share? 12:26:26

1 It's a tiny graph on my screen.

2 MS. DUPHILY: If you take your mouse on to the
3 bottom and push, you should be able to see a plus and a
4 minus to make it look bigger.

5 THE WITNESS: Okay. Ah, there we are. 12:26:47

6 All right. Sorry, it's taking me a minute to
7 zoom in on that.

8 MR. BLOCK: Sure thing.

9 THE WITNESS: Okay. So to make sure we're
10 looking at the same figure, the trans women are shown 12:27:05
11 in the solid line, the trans men are shown in the light
12 gray line, the cis men are shown in the dotted line,
13 and the cis women are shown in the hash line; correct?

14 BY MR. BLOCK:

15 Q Correct. 12:27:19

16 A Okay. So the percent body fat in the trans
17 women and the percent body fat in the cis women, the
18 lines overlap at the part indicated as "Start CHT."

19 Q Okay. So that indicates that by the time the
20 trans women in the study had begun CHT, their 12:27:42
21 percentages of body fat overlapped with the percentages
22 of body fat for cis women; right?

23 A That is correct.

24 Q Okay. And is body fat -- percentage of body
25 fat a factor in athletic advantage? 12:28:01

1 A Yes, it is. Having excess body fat is
2 considered a disadvantage.

3 Q Okay. So why didn't you mention this finding
4 in your summary of the Klaver study?

5 A Because I mentioned the next part of the 12:28:16
6 figure demonstrating that there was not elimination of
7 the difference in lean body mass.

8 Q No, I understand that, but why did you just
9 report on the lean body mass and not the body fat
10 finding? 12:28:31

11 MR. FRAMPTON: Objection; form.

12 THE WITNESS: Because lean body mass is a more
13 important determinant of athletic performance.

14 BY MR. BLOCK:

15 Q I see. Does your report ever say that lean 12:28:45
16 body mass is a more important determinant?

17 MR. FRAMPTON: Objection; form.

18 THE WITNESS: I have stated multiple times in
19 there that lean body mass is a determinant of athletic
20 performance, and I've stated that -- and I have stated 12:29:02
21 that excess body fat is a disadvantage.

22 BY MR. BLOCK:

23 Q Okay. But my question is, do you state that
24 lean body mass is a more important determinant?

25 MR. FRAMPTON: Objection; form. 12:29:19

1 THE WITNESS: I don't recall where I specified
2 which is more or least important in --
3 MR. BLOCK: Okay.
4 THE WITNESS: -- in regards to body
5 composition. 12:29:23

6 BY MR. BLOCK:

7 Q Okay. You have a whole section in your report
8 on the subject of body fat percentage; correct?

9 A Again, I would have to look to see if it's a
10 whole section, if we're talking about a couple 12:29:38
11 paragraphs, a couple of pages or whatnot, but, yes, I
12 talk about body composition.

13 Q Okay. And you don't cite this study when you
14 discuss body composition related to fat; correct?

15 A So I'm -- you're saying that I'm not citing 12:29:51
16 Klaver in my previous discussions of body composition
17 as a determinant of athletic performance?

18 Q In your discussion of the role of body fat in
19 the -- as a determinant of athletic performance, you
20 never cite to the findings of this Klaver article; 12:30:09
21 correct?

22 A I -- I don't think so. I think these are the
23 only paragraphs where I cite the Klaver articles, and
24 we're talking specifically about with the puberty
25 blockers. 12:30:23

1 Q I see. So -- but you -- you cite a finding of
2 the Klaver article that you think is -- supports your
3 view, but you don't cite a finding of the Klaver
4 article that cuts against your view. Is that a fair
5 statement? 12:30:41

6 MR. FRAMPTON: Objection; form.

7 THE WITNESS: Yes, I would say that it's fair
8 to say that I don't cite Klaver on the differences in
9 percent body fat.

10 BY MR. BLOCK: 12:30:55

11 Q Okay. So you testified earlier that you think
12 that an expert report needs to be held to the same
13 standards of accuracy as a peer-reviewed article;
14 right?

15 A Yes, that is correct. 12:31:06

16 MR. FRAMPTON: Objection --

17 THE WITNESS: Oh, sorry.

18 BY MR. BLOCK:

19 Q So do -- do you think your -- your paragraph
20 about Klaver is an accurate summary of the article in 12:31:14
21 its entirety?

22 MR. FRAMPTON: Objection; form.

23 THE WITNESS: The paragraph is not intended to
24 be a summary of the article in its entirety.

25 ///

1 BY MR. BLOCK:

2 Q Okay. The paragraph is -- is just intended to
3 pick out the portions of the article that support your
4 argument; is that right?

5 MR. FRAMPTON: Objection; form. 12:31:33

6 THE WITNESS: The paragraph is intended to
7 demonstrate that biological males retain athletic
8 advantages.

9 BY MR. BLOCK:

10 Q Well, the -- the article doesn't say anything 12:31:44
11 about athletic advantages; correct?

12 A I do not recall that the article uses the word
13 "athletic advantages."

14 Q All right. If you go to -- if you look at
15 page 255 of the Klaver article. So I think that's, 12:32:02
16 like, one page before the -- the -- where we were
17 looking.

18 A You're looking at table 2?

19 Q No. I'm -- I am just looking at the -- the --
20 the text of it. 12:32:25

21 A Okay.

22 Q If you look at the first full sentence in the
23 text that begins with "As a result."

24 A Okay.

25 Q Do you see that? 12:32:45

1 A Yes, I do.

2 Q All right. It says (as read):

3 "As a result of these changes, in
4 young adult transwomen at age 22" --

5 Excuse me. (As read): 12:32:56

6 "As a result of these changes, in
7 young adult transwomen at 22 years of
8 age, SDS for WHR, body fat, and LBM
9 showed greater similarity to ciswomen
10 than to cismen." 12:33:08

11 Did I read that correctly?

12 A Yes, you read that correctly.

13 Q Okay. And do you mention that finding in your
14 report?

15 A I do not think I quote that in my report. 12:33:17

16 Q Okay. All right.

17 MR. BLOCK: It's 1:30 -- can we go off the
18 record?

19 THE WITNESS: Is that okay with you going off
20 the record? 12:33:41

21 MS. DUPHILY: Kimberlee, are you there?

22 THE WITNESS: Nope.

23 MS. DUPHILY: We're going off the record at
24 approximately 1:32 p.m. [Sic]

25 (Recess.) 12:38:29

1 THE VIDEOGRAPHER: We are on the record at
2 12:38 p.m.

3 MR. BLOCK: Okay. Great.

4 BY MR. BLOCK:

5 Q I'd like to move on from the topic of puberty 12:38:43
6 blockers and ask a few questions about trans women who
7 suppress circulating levels of testosterone after
8 puberty.

9 Can we turn to page 56 of your report?

10 A Come on. Waiting for it to load. 12:39:04

11 All right. So page 56 by the page numbers;
12 correct?

13 Q Correct.

14 A All right. I'm there.

15 Q Great. So if you go to the third bullet 12:39:27
16 point, you say (as read):

17 "The administration of androgen
18 inhibitors and cross-sex hormones to
19 men or adolescent boys after the onset
20 of male puberty does not eliminate the 12:39:40
21 performance advantage that men and
22 adolescent boys have over women and
23 adolescent girls in almost all
24 athletic events."

25 Did I read that right? 12:39:50

1 A Yes, you did.

2 Q Okay. Great.

3 Have you read the expert reports that -- the
4 expert reports that Dr. Safer submitted in this case?

5 A Yes, I read the reports by Dr. Safer. 12:40:00

6 Q All right. You read both the initial and the
7 rebuttal reports?

8 A Yes.

9 Q Okay. Isn't it fair to say that the effects
10 of male to female hormone treatment on important 12:40:10
11 determinants of athletic performance still remain
12 largely unknown?

13 MR. FRAMPTON: Object to form.

14 THE WITNESS: Sorry, I blanked out there for a
15 second after the objection. 12:40:28

16 There are still a lot of questions. There are
17 still a lot of questions.

18 MR. BLOCK: Okay. So I'd like to show you
19 another exhibit. And we have to mark it as such.

20 All right. This is going to hopefully appear 12:41:08
21 on your screen as Exhibit 73.

22 (Exhibit 73 was marked for identification
23 by the court reporter and is attached hereto.)

24 BY MR. BLOCK:

25 Q Can you let me know when -- when you see it? 12:41:18

1 A All right. Exhibit 073 - Brown Blog Post.

2 Q Yes. Do you recognize what this document is?

3 A Yes.

4 Q What is it?

5 A That is my blog post for the Physiology 12:41:38
6 Educators Community of Practice about The Olympics,
7 sex, and gender in the physiology classroom.

8 Q Okay. What -- what is the Physi- --
9 Physiology Educators Community of Practice blog?

10 A So this is a blog sponsored by the American 12:41:58
11 Physiological Society and their -- specifically their
12 educators' interest group -- it probably has a
13 different name than that, but that's what it is -- just
14 sharing information for other teachers in physiology,
15 typically geared towards college-level educators. 12:42:16

16 Q And is there a submission process?

17 A Yes, there is.

18 Q What -- what is that submission process?

19 A Well, you have to contact the person that runs
20 the blog post and say you are interested. They connect 12:42:33
21 you, then, to the editor for Advances in Physiology
22 Education who then asks what you would like to blog on
23 and lets you know of available times, and then once you
24 agree on that, you'll submit it. And then, once again,
25 the editor reviews it, someone else associated also 12:42:55

1 reviews it prior to being put up on the web.

2 Q Okay. And so did you reach out with your
3 interest in -- in submitting something?

4 A Yes, I did.

5 Q You weren't invited to submit something; 12:43:13
6 correct?

7 A I did receive an in- -- an e-mail inviting to
8 submit to the Peacock blog, and I e-mailed back and
9 said, yes, I'm interested.

10 Q And did -- were you invited to submit 12:43:27
11 something on the topic of transgender women
12 participating in sports?

13 A The invitation was not specific on what I
14 was -- would be blogging on.

15 Q And was it an invitation to you individually, 12:43:43
16 or was it an invitation to a larger group?

17 A I think both, honestly. There is an
18 invitation that goes out, periodically, to the larger
19 group of published a paper in Advances in Physiology
20 Education and received an invitation to me. 12:44:03

21 Q Okay. And so did this blog go through a
22 revision process after you first submitted it?

23 A There was one round of revisions, if I
24 remember correctly.

25 Q Okay. And do you remember what feedback you 12:44:23

1 got during the revision process?

2 A The feedback was very positive, and I was told
3 that this is an extremely important topic that needs to
4 be presented. And I really think the feedback was
5 relevant to the -- the -- the graph that I had in there 12:44:41
6 to ensure that I had appropriate copyright permission
7 or whatever permission to have that reproduced.

8 Q Okay. Great.
9 This blog post doesn't discuss prepubertal
10 children; right? 12:44:57

11 A Sorry, I'm just reviewing it to see.
12 I don't recall that it discusses prepubertal
13 children.

14 Q And the blog also doesn't discuss trans girls
15 and women who received puberty blockers and never went 12:45:25
16 through endogenous puberty; right?

17 MR. FRAMPTON: Objection to the form.

18 THE WITNESS: I don't recall discussing that
19 in there, and I'm not seeing it, as I look at the blog
20 post. 12:45:43

21 BY MR. BLOCK:

22 Q Okay. So if you can just go to page 2, and if
23 you go to the first full paragraph on page 2, beginning
24 with the -- the second sentence, do you --

25 A Yes. 12:46:04

1 Q -- see that?

2 A Yes, I do.

3 Q Okay. So the second sentence there says (as
4 read):

5 "It is also important to note that the 12:46:18
6 effects of male-to-female hormone
7 treatment on the important
8 determinants of athletic performance
9 remain largely unknown."

10 Did I read that right? 12:46:26

11 A Yes, you did.

12 Q Okay. Do you still agree with that statement?

13 A Yes, I still agree with that statement.

14 Q And so you think it's important to note that
15 the effects remain largely unknown; correct? 12:46:36

16 MR. FRAMPTON: Objection; form.

17 THE WITNESS: Yes. Prior to allowing
18 biological males to compete in female sports, we should
19 have a better understanding of how that process would
20 influence competition. 12:46:52

21 BY MR. BLOCK:

22 Q Okay. So in your expert report, do you ever
23 note that the effects of male to female hormone
24 treatment on important determinants of athletic
25 performance advantage remain largely unknown? 12:47:05

1 A I could look and see, but I think I say --
2 state something in my conclusion where there are still
3 a lot of variables that have not been measured.

4 BY MR. BLOCK:

5 Q Okay. In this paragraph that I was reading 12:47:20
6 from, I'm just going to go into the next one. It says
7 (as read):

8 "Measurements of VO2max in transwomen
9 using direct or indirect calorimetry
10 are not available." 12:47:35

11 Did I read that right, even if I didn't
12 pronounce it correctly?

13 A Yes.

14 Q Okay.

15 A "Calorimetry" is how I say it because it kind 12:47:41
16 of flows when you say it fast.

17 Q Okay. That makes sense.

18 Do you ever note in your expert report that
19 measurements of VO2 max in trans women using direct or
20 indirect calorimetry are not available? 12:47:59

21 A Once again, I would need to refer back to my
22 report in the conclusions to see if I had included that
23 in there.

24 Q Do you think it would make sense to have
25 included that in there? 12:48:16

1 MR. FRAMPTON: Objection; form.

2 THE WITNESS: Yes, I think it would make sense
3 to include that in there, but it also -- like I said, I
4 cannot recall if I did or did not.

5 BY MR. BLOCK: 12:48:33

6 Q Okay. Well, let's -- well, let's look at your
7 report on -- so if you begin on page 39 of your report.

8 A All right.

9 Q All right. So this is -- Roman numeral V says
10 (as read): 12:49:04

11 "The available evidence shows that
12 suppression of testosterone in a male
13 after puberty has occurred does not
14 substantially eliminate the male
15 athletic advantage." 12:49:14

16 Right? That -- that's what section Roman
17 numeral V says; correct?

18 A That is correct.

19 Q Okay. And then subsection A on that page
20 talks about (as read): 12:49:25

21 "Empirical studies find that males
22 retain a strong performance advantage
23 even after lengthy testosterone
24 suppression."

25 Correct? 12:49:31

1 A Correct.

2 Q All right. Then on 40, there's a subsection
3 that says, "Hand Grip Strength."

4 A Okay.

5 Q Okay. And if you -- apologies. You know, 12:49:38
6 I -- I should have directed you to page 46,
7 subsection B of that. So if you can just skip ahead to
8 46.

9 A Okay. Page 46.

10 Q Great. Thank you. 12:50:00

11 So subsection B says (as read):

12 "Testosterone suppression does not
13 reverse important male physiological
14 advantages."

15 Right? 12:50:09

16 A Yes.

17 Q Okay. And then if you turn the page, on 47,
18 at the -- page 47, at the bottom, there's a little
19 discussion on cardiovascular advantages; right?

20 A Yes. 12:50:20

21 Q All right. And where would VO2 -- where would
22 the discussion of VO2 max go? Would that be in the
23 "Cardiovascular Advantage" section or in a different
24 subsection of this discussion?

25 MR. FRAMPTON: Object to the form. 12:50:40

1 THE WITNESS: It would probably belong in the
2 cardiovascular advantages.

3 BY MR. BLOCK:

4 Q Okay. So do you see, just in this subsection,
5 a discussion of the fact that measurements of VO2 max in 12:50:51
6 trans women using direct or indirect calorimetry are
7 not available?

8 A I have not directly made that statement.

9 Q Okay. And if -- toggling back over to -- to
10 Exhibit 73, your blog post, after that statement I just 12:51:17
11 read, you say (as read):

12 "Measurements of muscle strength in
13 standard lifts (e.g. bench press, leg
14 press, squat, deadlift, etc.) in
15 transwomen are not available." 12:51:29

16 Is that correct?

17 A That is correct.

18 Q All right. Do you disclose that information
19 in your expert report?

20 MR. FRAMPTON: Objection to the form. 12:51:39

21 THE WITNESS: In my expert report, I talk
22 about the measurements of strength that have been
23 conducted.

24 BY MR. BLOCK:

25 Q But you do not discuss the measurements of 12:51:52

1 strength that have not been conducted; correct?

2 MR. FRAMPTON: Objection to the form.

3 THE WITNESS: I'm scrolling up to see if I
4 have some statement in there about, you know, specific
5 measurements. 12:52:13

6 Here again, no, I do not specifically state
7 that those measurements have not been conducted.

8 BY MR. BLOCK:

9 Q Okay. And then in the next sentence of the
10 blog post, you say (as read): 12:52:27

11 "Nor have there been evaluations of
12 the effects of male-to-female hormone
13 therapy on agility, flexibility, or
14 reaction time."

15 Is that right? 12:52:37

16 A That is correct.

17 Q Okay. And you do not, in your report, say
18 anything about whether -- about the effects of hormone
19 therapy on agility, flexibility or reaction time, do
20 you? 12:52:55

21 MR. FRAMPTON: Objection to the form.

22 THE WITNESS: On page 39, I state that only a
23 limited number of studies have directly measured the
24 effect of testosterone suppression and the
25 administration of female hormones on the athletic 12:53:05

1 performance of males. And so then I go through those
2 studies which, you know, by default, then says those
3 other things have not been studied.

4 BY MR. BLOCK:

5 Q Okay. But you do discuss agility, flexibility 12:53:18
6 and reaction time when you're discussing the advantages
7 of cisgender men over cisgender women; right?

8 A Yes.

9 Q Okay. But then you don't have -- well, let me
10 just read the next part of the -- the blog post. (As 12:53:39
11 read):

12 "There has been no controlled research
13 evaluating how male-to-female hormone
14 treatment influences the adaptations
15 to aerobic or resistance training." 12:53:50

16 Is that correct?

17 A That is correct.

18 Q And again, that's not something you mention in
19 your report; correct?

20 MR. FRAMPTON: Objection to the form. 12:54:01

21 THE WITNESS: It is indirectly stated with my
22 statement about limited number of studies.

23 BY MR. BLOCK:

24 Q Okay. And then the final sentence in that
25 paragraph is (as read): 12:54:10

1 "And there are only anecdotal reports
2 of the competitive athletic
3 performance of transwomen before and
4 after using male-to-female hormone
5 treatment." 12:54:20

6 Is that right?

7 A That is correct.

8 Q Okay. So it's fair to say that when you
9 discuss Cecé Telfer in your report, that's an example
10 of one of the anecdotal reports you refer to in this 12:54:31
11 sentence; correct?

12 A That's correct.

13 Q Okay. So the discussion of Cecé Telfer and
14 Lia Thomas and Andraya Yearwood and Terry Miller, those
15 are, to use your words from the blog post, quote, only 12:54:56
16 anecdotal reports; correct?

17 MR. FRAMPTON: Objection to the form.

18 Go ahead.

19 THE WITNESS: If I may state, in my
20 declaration, I do cite a prepublished study by 12:55:12
21 Michael Joyner that is evaluating -- or, sorry,
22 Senefeld and Joyner that is evaluating Lia Thomas.

23 But yes, those -- those would primarily be
24 anecdotal reports.

25 ///

1 BY MR. BLOCK:

2 Q Okay. If you go to the second sentence in the
3 final paragraph, you say, (as read):

4 In the end, whether it is safe and
5 fair to include transgender athletes 12:55:46
6 and athletes with DSD in women's
7 sports comes down to a -- to a few
8 facts that can be extrapolated, lots
9 of opinions, and an interesting but
10 complicated discussion. 12:55:57

11 Did I read that right?

12 A I'm sorry, where were you reading that from?

13 Q Yeah, it's the -- it's the second sentence in
14 the last paragraph of your blog post.

15 A Okay. There. 12:56:12

16 Q Okay. I'll read it again. (As read):

17 In the end, whether it is safe and
18 fair to include transgender athletes
19 and athletes with DSD in women's
20 sports comes down to a few facts that 12:56:21
21 can be extrapolated, lots of opinions,
22 and an interesting but complicated
23 discussion.

24 Is that right?

25 A That is correct. 12:56:31

1 Q And you still agree with that statement?

2 A Yes.

3 Q Okay. What do you -- what do you mean by
4 "interesting but complicated discussion"?

5 A Well, as I was writing this for fellow 12:56:43
6 educators, this could be a very complicated discussion
7 because of -- this could be a very heated topic.

8 Q Okay. So when you say that there -- "a few
9 facts that can be extrapolated, lots of opinions, and
10 an interesting but complicated discussion," were you 12:57:09
11 referring at all to the underlying substance being
12 interesting but complicated?

13 MR. FRAMPTON: Objection to the form.

14 THE WITNESS: Yeah, I'm not sure what you mean
15 by "underlying substance." 12:57:25

16 BY MR. BLOCK:

17 Q Yeah, is the discussion of whether -- aside
18 from something being heated, is -- is the -- this topic
19 complicated?

20 MR. FRAMPTON: Objection to the form. 12:57:40

21 THE WITNESS: Yes, this is a complicated
22 topic.

23 BY MR. BLOCK:

24 Q Okay. So if we go to your report again --
25 let's see -- on page 57 of your report. 12:57:57

1 A All right. Page 57.

2 Q So if you look just at the paragraph beginning
3 with the word "but."

4 A Okay. All right.

5 Q All right. You say -- you know, actually, 12:58:32
6 instead, let's go a few sentences above that, so in the
7 middle of the previous paragraph beginning with -- the
8 sentence beginning with "instead."

9 Do you see that?

10 A I'm sorry, which -- 12:58:49

11 Q So this is about five -- five lines from the
12 top.

13 A Okay. Yes. It says, "Instead, the IOC"?

14 Q Yeah. So this says --

15 A Okay. 12:58:58

16 Q -- (as read):

17 Instead, the IOC calls on other
18 sporting bodies to define criteria for
19 transgender inclusion, while demanding
20 that such criteria simultaneously 12:59:05

21 ensure fairness, safety, and inclusion
22 for all. The recent -- recently

23 updated NCAA policy on transgender

24 participation also relies on other

25 sporting bodies to establish criteria 12:59:19

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1 for transgender inclusion while
2 calling for fair competition and
3 safety.

4 But what we currently know tells us
5 that these policy goals—fairness, 12:59:28
6 safety, and full transgender
7 inclusion—are irreconcilable for many
8 or most sports.

9 Did I read those sentences correctly?

10 A Yes, you did. 12:59:40

11 Q Okay. How come -- why, in your blog post, did
12 you not say that the goals of fairness, safety and full
13 transgender inclusion are irreconcilable?

14 MR. FRAMPTON: Objection to the form.

15 THE WITNESS: The purpose of the blog post was 12:59:58
16 to stimulate discussions in classroom while providing a
17 little bit of guidance, but not advocate for a specific
18 position within a classroom.

19 BY MR. BLOCK:

20 Q Why didn't you say in your expert report that 01:00:13
21 whether it is safe and fair to include transgender
22 athletes and athletes with DSD in women's sports comes
23 down to a few facts that can be extrapolated, lots of
24 opinions, in an interesting but complicated discuss?

25 MR. FRAMPTON: Objection to the form. 01:00:28

1 THE WITNESS: I think that a reasonable person
2 would come to those conclusions after reading all --
3 how many pages of my report?

4 BY MR. BLOCK:

5 Q Okay. So it's your expert testimony that 01:00:39
6 whether it is safe and fair to include trans girls and
7 women on girls and women's sports teams comes down to a
8 few facts that can be extrapolated, lots of opinions
9 and an interesting but complicated discussion?

10 MR. FRAMPTON: Object to the form. 01:01:01

11 THE WITNESS: Yes, I will stand by that
12 statement in my blog post.

13 MR. BLOCK: Okay. Great.

14 So I'm going to now ask a few questions about
15 your other, you know -- your other publication or 01:01:17
16 submission on this topic. Let me just move it into the
17 actual exhibits.

18 Let's see. So I -- this is a PowerPoint
19 document. It's going to be marked as Exhibit 74, although
20 I am not sure that it is actually going to work, 01:02:07
21 showing up, so please let me know if it actually shows
22 up for you.

23 (Exhibit 74 was marked for identification
24 by the court reporter and is attached hereto.)

25 THE WITNESS: All right. I see Exhibit 074. 01:02:21

1 MR. BLOCK: Okay. And I think we're going to
2 need some assistance in how -- how do we zoom in again,
3 Concierge?

4 MS. DUPHILY: You just hold your mouse over
5 the bottom of the image, and you'll see the positive 01:02:37
6 and negative-looking glasses at the bottom, and you
7 can -- there's a menu.

8 Do you see that?

9 MR. BLOCK: Mouse over the image?

10 MS. DUPHILY: You want to click on it when 01:02:54
11 you're --

12 MR. BLOCK: All right.

13 MS. DUPHILY: Did you do it?

14 MR. FRAMPTON: With the witness, we're not
15 getting that. 01:03:03

16 MS. DUPHILY: Hold on a minute. Let me see.

17 MR. TRYON: Yeah, this is Dave Tryon. I've
18 seen that on other exhibits, but this one, it's not
19 showing up for me.

20 MR. BLOCK: If you're able to download a 01:03:19
21 copy --

22 MS. DUPHILY: Yeah, you're probably better off
23 downloading this because it's a PowerPoint.

24 BY MR. BLOCK:

25 Q Have you been able to download it, Dr. Brown? 01:04:02

1 A It appears that my computer is trying to
2 update PowerPoint at this very moment.

3 Q Okay.

4 MR. BLOCK: So why don't we -- can we go off
5 the record, please? 01:04:12

6 MR. FRAMPTON: It looks like it's nearly --

7 THE VIDEOGRAPHER: We are off the record at
8 1:04 p.m.

9 (Recess.)

10 THE VIDEOGRAPHER: We are on the record at 01:05:37
11 1:05 p.m.

12 MR. BLOCK: Thanks.

13 BY MR. BLOCK:

14 Q So is this a presentation that you authored,
15 Dr. Brown? 01:05:51

16 A Yes, it is.

17 Q And the title of this presentation is
18 "Transwomen Competing in Women's Sports: What We Know,
19 and What We Don't"; is that right?

20 A That is correct. 01:06:01

21 Q Okay. And what conference did you submit this
22 presentation to?

23 A This was the American Physiological Society
24 Sex and Gender conference, if I remember the title
25 correctly. 01:06:18

1 Q Yeah. If I -- if I said it was called "The
2 New Trends in Sex and Gender Medicine" conference, does
3 that sound accurate to you?

4 A Yes.

5 Q Okay. And am I right that the conference took 01:06:28
6 place from October 19th to October 22nd?

7 A That sounds correct.

8 Q Okay. Did you attend any meetings or panel
9 discussions as part of this conference?

10 A So this was a virtual conference for everyone. 01:06:42

11 Q Uh-huh.

12 A And so, yes, I sat in on discussions and panel
13 discussions and presentations and such.

14 Q Okay. Did you sit in on the panel discussion
15 at this conference titled "New Trends in Transgender 01:07:05
16 Medicine"?

17 A I honestly can't remember if I sat in and
18 attended that or not.

19 Q Okay. You have no recollection one way or the
20 other? 01:07:18

21 A Yeah, I -- there was a lot of meetings, a lot
22 of presentations and a lot of discussions, so I can't
23 say exactly which ones I was in and which ones I was
24 not.

25 Q Do you think it would have been informative to 01:07:32

1 attend that presentation?

2 A Yes.

3 MR. FRAMPTON: Objection to the form.

4 THE WITNESS: Sorry.

5 MR. FRAMPTON: Go ahead. 01:07:39

6 BY MR. BLOCK:

7 Q You can answer.

8 A Yes, it -- it would have been informative.

9 Q Okay. And do you think it would have been at
10 least as relevant to your research as Ben Shapiro? 01:07:49

11 MR. FRAMPTON: Object to the form.

12 THE WITNESS: It's possible that I had a
13 conflicting obligation that made it so I'm not able to
14 attend. Again, I know that I did with all of them, I
15 wasn't able to attend every single session I wanted 01:08:04
16 because of other obligations.

17 BY MR. BLOCK:

18 Q I see. But -- but my question is, would -- it
19 would be a more reliable source of information than
20 Ben Shapiro, was my question. 01:08:19

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: I guess that would depend on
23 what we're asking, Ben Shapiro is -- is speaking about
24 and where he is citing his sources versus what is being
25 discussed in that discussion. 01:08:37

1 BY MR. BLOCK:

2 Q Okay. Now, would -- would this
3 presentation quali- -- would -- could this be
4 prescribed as a poster presentation?

5 A Yes. 01:08:51

6 Q Okay. Does your CV identify it as a poster
7 presentation?

8 A I don't think my CV discriminates on my
9 various academic presentations, as to what format they
10 were presented in. 01:09:06

11 Q Okay. So it's not your regular practice to
12 denote whether a presentation is specifically a poster
13 presentation?

14 A That is correct.

15 Q Okay. All right. What was the review process 01:09:13
16 for submitting this?

17 A So I -- I was encouraged by an editor from the
18 American Journal of Physiology to submit to this, after
19 having read my blog post. I submitted it, paid the
20 abstract submission fee, like any other professional 01:09:34
21 conference, and awaited for acceptance of the abstract.

22 Q And what -- were there edits to the abstract
23 sent back to you?

24 A No. They don't edit the abstracts.

25 Q Okay. All right. 01:09:47

1 If you go to the bottom right-hand corner of
2 this presentation, there's a box titled "What we don't
3 know"; right?

4 A Correct.

5 Q Okay. And then -- and this box says, "What We 01:10:09
6 Don't Know," and then the first bullet is "No
7 controlled training studies with male-to-female hormone
8 use"; correct?

9 A Correct.

10 Q Okay. And -- and again, as we discussed 01:10:20
11 before, that -- that statement is not in your expert
12 report; right?

13 MR. FRAMPTON: Object to the form.

14 THE WITNESS: That statement is not verbatim
15 in my expert report. 01:10:36

16 BY MR. BLOCK:

17 Q And then the second bullet point is "No
18 measurements of changes in VO2max, running economy,
19 lactate threshold, anaerobic power (e.g. Wingate test),
20 vertical jump, 1-Repetition Maximum (e.g. bench press, 01:10:47
21 leg press, squat, deadlift), or many other common
22 determinants of athletic performance"; correct?

23 A That is correct.

24 Q And that information in that bullet point is
25 not included in your expert report; correct? 01:11:05

1 MR. FRAMPTON: Object to the form.

2 THE WITNESS: Again, in my expert report, I
3 state that there is limited evaluation. I don't make
4 that statement exactly.

5 BY MR. BLOCK: 01:11:17

6 Q Okay. How come this poster presentation
7 doesn't say that the policy goals of fairness, safety
8 and full transgender inclusion are irreconcilable for
9 many or most sports?

10 MR. FRAMPTON: Object to the form. 01:11:28

11 THE WITNESS: This poster was put together and
12 presented before the recent IOC or NCAA adjustments,
13 stating that that was a requirement. And again, the
14 poster is summarizing the science of what we know and
15 what we do not know. 01:11:48

16 BY MR. BLOCK:

17 Q So would you feel comfortable making the
18 statement to a -- a peer-reviewed publication that the
19 policy goals of fairness, safety and full transgender
20 inclusion are irreconcilable? 01:12:05

21 A Yes, I would feel very comfortable saying that
22 in a peer-reviewed pol- -- publication or presentation.

23 Q Can you tell me your understanding of what
24 this case is about?

25 MR. FRAMPTON: Object to the form. 01:12:31

1 Go ahead.

2 THE WITNESS: So the State of West Virginia,
3 like about currently 11 other states, if I recall,
4 passed a law to limit participation in women's sports
5 to biological women. 01:12:43

6 In this case, a young trans girl has retained
7 some lawyers and filed a lawsuit asking to be able to
8 participate in girls sports.

9 The judge has given an injunction specifically
10 for the plaintiff, but not halting the law overall. 01:13:05

11 BY MR. BLOCK:

12 Q And do you -- so the -- the plaintiff's name
13 is -- is Becky.

14 Do you oppo- -- do you think Becky should not
15 be allowed to participate on her middle school 01:13:23
16 cross-country team?

17 MR. FRAMPTON: Object to the form and scope.

18 THE WITNESS: So my understanding is the
19 plaintiff is biologically male, so a trans girl, who
20 wants to compete on girls sports. 01:13:39

21 BY MR. BLOCK:

22 Q Yes. And -- and so what's the answer to my
23 question?

24 A So --

25 MR. FRAMPTON: Same objections. 01:13:54

1 THE WITNESS: So if we were to follow the law,
2 then the plaintiff should not be participating in
3 girls' sports.

4 BY MR. BLOCK:

5 Q Yeah, but it's your -- is it your expert 01:14:01
6 opinions that Becky should not be participating in the
7 girls' cross-country team at her middle school?

8 MR. FRAMPTON: Objection; form and scope.

9 THE WITNESS: So my expert statement, expert
10 declaration, is not meant to make judgments on an 01:14:17
11 individual basis, but overall policy and law.

12 BY MR. BLOCK:

13 Q Okay. Well, so you -- you made a distinction
14 between the fact that the injunction is -- applies only
15 to Becky and not to the -- the statute on its face, and 01:14:31
16 so I'm just trying to figure out whether your expert
17 opinion is only about other applications of the statute
18 to people beyond Becky or whether you are also offering
19 expert testimony with respect to the specific issue of
20 Becky's as-applied challenge. 01:14:51

21 MR. FRAMPTON: Objection; form and scope.

22 THE WITNESS: I've not made any statements
23 that I'm aware of specific to an individual plaintiff
24 in this case or -- I don't think in any of the cases.

25 ///

1 BY MR. BLOCK:

2 Q Okay. So you're not offering an expert
3 opinions in this case with regard to whether Becky, as
4 an individual, should be allowed to participate on her
5 girl's cross-country team in middle school? 01:15:22

6 MR. FRAMPTON: Objection; form and scope.

7 THE WITNESS: I'm offering an expert opinion
8 based on what the science says and what we know overall
9 regarding differences between males and females and how
10 those differences are affected by transgender hormone 01:15:37
11 use.

12 BY MR. BLOCK:

13 Q Okay. And are you offering any opinion on
14 whether Becky, as an individual, has any athletic
15 advantages compared to cisgender girls? 01:15:52

16 MR. FRAMPTON: Objection; form and scope.

17 THE WITNESS: I'm not making statements
18 specific to Becky. I am talking about boys and girls
19 overall.

20 BY MR. BLOCK: 01:16:07

21 Q Okay. And it's possible that Becky, as an
22 individual, as opposed to people with a male sex
23 assigned at birth overall -- let me just rephrase that.

24 It's possible that Becky, as an individual,
25 may not have any athletic advantages compared with 01:16:21

1 cisgender girls; right?

2 MR. FRAMPTON: Object to the form and scope.

3 THE WITNESS: Based on the information I have
4 read, the information cited in my expert report, if we
5 are comparing the plaintiff to a similarly aged trained 01:16:34
6 and gifted girl, the plaintiff, as a biological male,
7 will have athletic advantages.

8 BY MR. BLOCK:

9 Q Well, that -- that raises questions for me.

10 I -- I -- I guess my understanding of your 01:16:49
11 report was that you were discussing average group-based
12 differences between males and females; right?

13 A If you look at my --

14 MR. FRAMPTON: Objection; form.

15 Go ahead. 01:17:01

16 THE WITNESS: If you look at my report, I -- I
17 provide information on individuals in the 10th
18 percentile, individuals in the 50th percentile,
19 individuals in the 90th percentile, and state multiple
20 times if we compare equally trained, gifted and 01:17:14
21 talented same-age individuals, the males have an
22 advantage.

23 BY MR. BLOCK:

24 Q Well, what do you mean by "gifted"?

25 A There are many gifts that could help a person 01:17:25

1 be a better athlete than others, whether --

2 Q So --

3 A -- whether it is something biological, whether
4 that is something with family support.

5 Q Okay. But -- so when -- when you're 01:17:43

6 discussing the physiological characteristics that, on
7 average, make cisgender boys have better outcomes in
8 athletic performance than cisgender girls, you're not
9 saying that every single cisgender boy has

10 physiological characteristics that make -- that give 01:18:03

11 them an advantage over the average cisgender girl of
12 the same age and training, are you?

13 MR. FRAMPTON: Object to the form.

14 THE WITNESS: When we look at the data, if you
15 compare comparably gifted aged and trained males and 01:18:24
16 females, the males have an advantage.

17 BY MR. BLOCK:

18 Q Yeah, but you're -- you're smuggling in the
19 word "gifted" here, and you're including these
20 physiological characteristics as meaning gifted, it 01:18:34
21 sounds like.

22 I'm trying to isolate your testimony about
23 physiological advantages, okay?

24 And so it's possible there's -- there's plenty
25 of boys that are shorter than girls; right? 01:18:46

1 A Yes, there are some boys that are shorter than
2 some girls.

3 Q Yes. So not -- not every -- and there are
4 some boys that are shorter than the average girl of the
5 same age; correct? 01:19:04

6 A Yes, there are some boys that are shorter than
7 the average girl.

8 Q Okay. So not -- not every -- so even if
9 males, on average, are taller than females, on average,
10 not every male is gifted with greater height than the 01:19:18
11 average girl of the same age; right?

12 A 50 percent of men are taller than 90 percent
13 of women.

14 Q Yeah. And I know you're -- you're -- you're
15 making a statement, though, that that doesn't answer my 01:19:38
16 question. And so I'm taking that as -- is the answer
17 to my question "correct"?

18 A Could you restate the question, please?

19 Q Yes. Not every boy is taller than the average
20 cisgender woman; right? 01:19:54

21 Let me switch from boys to gir- -- to a woman.

22 Not every cisgender boy is taller than the
23 average cisgender girl of the same age; correct?

24 A If I can -- I'm -- I'm just a little confused
25 here because you are comparing an absolute of every boy 01:20:13

1 with average.

2 Q Yes, I -- I -- I am. I -- I'm saying that it
3 is entirely possible that there's an individual that is
4 not taller than the -- an individual who is a boy that
5 is not taller than the average girl, the mean -- or the 01:20:31
6 mean height of girls of the same age; right?

7 A Yes. So if you look at the distribution
8 curves for body height, boys on the shorter end of the
9 distribution curve may be shorter than girls in the
10 average of the distribution curve. 01:20:47

11 Q And -- and the same is true for speed; right?

12 A If I may, I would actually like to refer back
13 to the graphs by Gabe Higgard so we could look and see
14 where the slowest boys are relative to the
15 50th percentile for the girls in those competitions. 01:21:09

16 Q Okay. We can -- so we -- I appreciate that.
17 We can refer back to that later.

18 Are -- are you familiar at all with Becky's
19 athletic performance?

20 A No. I know nothing of Becky's athletic 01:21:26
21 performance.

22 Q Okay. And you -- as we said before, you are
23 not providing expert testimony about her as an
24 individual; correct?

25 A Right. I'm providing testimony on overall 01:21:41

1 what we would see if we compare equal, as much as
2 possible, males to females.

3 Q And is it your understanding of -- of this law
4 that it prevents girls who are transgender from
5 participating on the same sports teams as cisgender 01:22:06
6 girls?

7 MR. FRAMPTON: Object to the form and scope.

8 THE WITNESS: My understanding is, yes, this
9 states that people should participate in sports
10 based -- based on their biological sex. 01:22:21

11 BY MR. BLOCK:

12 Q Right. And, therefore, transgender girls
13 should not be allowed to participate on the same sports
14 team as cisgender girls; correct?

15 MR. FRAMPTON: Same objection. 01:22:32

16 THE WITNESS: Just going to rephrase that.

17 So trans girls should not be competing with
18 cis girls, yes.

19 BY MR. BLOCK:

20 Q Okay. Thank you. 01:22:40

21 And you think H.B. 3293 -- well, let me say,
22 do you know what I'm talking about when I refer to
23 H.B. 3293?

24 A I know we're talking about H.B. I don't
25 remember the number. I will assume that it is the law 01:22:57

1 in West Virginia.

2 Q Okay. Great.

3 You think H.B. 3293 is justified by science;
4 right?

5 MR. FRAMPTON: Object to the form and scope. 01:23:06

6 THE WITNESS: Yes, I do.

7 BY MR. BLOCK:

8 Q Okay. And you think it's justified by science
9 even though it applies to trans girls who, as a result
10 of puberty blockers and gender-affirming hormones, 01:23:23
11 never go through endogenous puberty; right?

12 MR. FRAMPTON: Same objections.

13 THE WITNESS: Yes.

14 BY MR. BLOCK:

15 Q And you think H.B. 3293 is justified by 01:23:29
16 science even though it applies to trans girls and women
17 who go through endogenous puberty and then take
18 medication to lower their levels of circulating
19 testosterone; right?

20 MR. FRAMPTON: Same objections. 01:23:43

21 THE WITNESS: Yes.

22 BY MR. BLOCK:

23 Q Okay. And you think H.B. 3293 is justified by
24 science even though it applies the same categorical
25 rule to all sex-separated sports instead of creating 01:23:50

1 different standards for different sports; is that
2 right?

3 MR. FRAMPTON: Same objections.

4 THE WITNESS: Yes.

5 BY MR. BLOCK: 01:24:01

6 Q Okay. I would like to direct your attention
7 to paragraph 8 of your report. Let me know when you're
8 there.

9 A It is on page 7, under item II, "Biological
10 men"?. 01:24:29

11 Q Yes.

12 A Okay.

13 Q Okay. Make sure I'm there myself.

14 Okay. So I'm just going to read this to you,
15 beginning with the second sentence. (As read): 01:24:44

16 "I cited many" --

17 Actually, I'll begin with the first sentence.

18 Sorry.

19 You say (as read):

20 "Nevertheless, these differences have 01:24:52

21 been extensively studied and measured.

22 I cited many of these studies in the

23 first paper on this topic that I

24 prepared, which was submitted in

25 litigation in January 2020. 01:25:03

1 Since then, in light of current
2 controversies, several authors have
3 compiled valuable collections or
4 reviews of data extensively
5 documenting this objective fact about 01:25:11
6 the human species, as manifest in
7 almost all sports, each of which I
8 have reviewed and found informative.

9 Did I read that correctly so far?

10 A Yes, you did. 01:25:23

11 Q Okay. Thanks.

12 And you say (as read):

13 "These include Coleman (2020), Hilton
14 & Lundberg (2021), World Rugby (2020),
15 Harper (2021), Hamilton (2021), and a 01:25:36
16 'Briefing Book' prepared by the
17 Women's Sports Policy Working Group
18 (2021).

19 Did I read that right?

20 A Yes. 01:25:46

21 Q Okay. And if you -- if you could look at
22 the -- that list that you gave, and I'd like you to --
23 to tell me -- and I -- and I will write it down --
24 which of those sources support excluding transgender
25 girls and women from sports if they have had puberty 01:26:08

1 blockers and gender-affirming hormones and, as a
2 result, have not gone through endogenous puberty.

3 MR. FRAMPTON: Object to the form.

4 THE WITNESS: Can you please rephrase that
5 question? It was just kind of long. 01:26:21

6 BY MR. BLOCK:

7 Q Yeah, sure.

8 So I -- I'm talking about trans girls who have
9 been on puberty blockers and, as a result, not
10 experienced endogenous puberty. 01:26:33

11 Which of the sources identified in paragraph 8
12 support excluding those trans girls who are on puberty
13 blockers from participating in girls and women's
14 sports?

15 MR. FRAMPTON: Object to the form. 01:26:47

16 THE WITNESS: I cannot recall right now which
17 or if any of those papers discuss specifically puberty
18 blockers.

19 BY MR. BLOCK:

20 Q Okay. So -- so you can't recall whether any 01:26:58
21 of those papers discuss puberty blockers at all. Is
22 that what you're saying?

23 A I'm saying I cannot recall if they advocate
24 for preventing people who have used puberty blockers
25 from participating in girls' sports. 01:27:15

1 Q Okay. Can you recall if any of them advocate
2 in favor of allowing girls who use puberty blockers to
3 participate in girls and women's sports?

4 A Well, as we discussed earlier, the Women's
5 Sports Policy Working Group has a statement about that, 01:27:37
6 and I think World Rugby has a statement about that.

7 Q Okay. Any others?

8 A I can't recall from the others.

9 Q Okay. So just in terms of what you can
10 recall, at least two of them advocate in favor of 01:27:52
11 allowing trans girls on puberty blockers to participate
12 and you can't recall if any of the others support
13 excluding girls who are transgender?

14 MR. TRYON: Objection.

15 MR. FRAMPTON: Same objection. Form. 01:28:17

16 THE WITNESS: So I can't recall specifically.
17 I think Hilton and Lundberg have some mention on that
18 topic, but again, I can't recall without referring back
19 to the paper to look.

20 BY MR. BLOCK: 01:28:28

21 Q Okay. And so which of the sources cited in
22 this paragraph advocate in favor of excluding trans
23 girls and women who go through puberty and then
24 suppress testosterone?

25 MR. FRAMPTON: Objection; form. 01:28:46

1 Go ahead.

2 THE WITNESS: I think that is Hilton and
3 Lundberg and World Rugby and Harper and Hamilton and
4 the Women's Sports Policy Working Group.

5 BY MR. BLOCK: 01:28:55

6 Q Okay. So it's Hilton and Lundberg and Harper
7 and World Rugby and Women's Sports Policy Working
8 Group?

9 A And, I think, Hamilton.

10 Q Okay. You think that those five sources 01:29:12
11 advocate in favor of excluding transgender girls and
12 women from participating on girls and women's sports
13 team if they have gone through endogenous puberty and
14 then lowered their levels of circulating testosterone?

15 MR. FRAMPTON: Object to the form. 01:29:36

16 THE WITNESS: Yes, I think those all indicate
17 that women deserve to compete in a protected category.

18 BY MR. BLOCK:

19 Q Okay. And then which of the sources cited in
20 paragraph 8 advocate in favor of having a categorical 01:29:49
21 rule that apply to all sports instead of
22 differentiating based on what sport is at issue?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: So World Rugby is speaking
25 specifically about rugby; and, therefore, I would not 01:30:14

1 expect it to talk too much about other sports.

2 If I recall correctly, Hamilton states
3 specifically that women deserve to compete in a
4 protected category, which implies all sports.

5 Hilton and Lundberg advocate for sex 01:30:31
6 segregation of sports, and, as far as I know, it's for
7 all sports.

8 And Harper indicates that trans women have a
9 retained athletic advantage compared to cisgender
10 women. 01:30:45

11 BY MR. BLOCK:

12 Q And so just to clarify, my question isn't
13 whether or not there should be separation in those --
14 in all sports; the question is whether or not there
15 should be the same rules for excluding transgender 01:30:58
16 girls and women in all sports.

17 MR. FRAMPTON: Objection; form.

18 THE WITNESS: I guess you'll need to rephrase
19 the question because I thought I answered it.

20 BY MR. BLOCK: 01:31:17

21 Q Yeah. So IOC used to have a single standard
22 that applied to all sports. They then changed their
23 policy so that individual standards could be crafted
24 for different sports.

25 H.B. 3293 has a single standard that applies 01:31:30

1 to all sports.

2 My question is which of the sources support
3 having a single standard that applies to all sports
4 instead of having individual standards crafted to
5 different sports.

01:31:46

6 MR. FRAMPTON: Objection to the form.

7 THE WITNESS: I would need to review each of
8 them to be specific and certain. So going off of
9 memory, Hilton and Lundberg, Hamilton, Women's
10 Sport (sic) Policy Working Group, again, as I recall,
11 without looking at them specifically, state that it
12 should be categorical women's sports and men's sports.

01:32:05

13 MR. BLOCK: Okay. Can we go off the record
14 for a second?

15 MR. FRAMPTON: Sure.

01:32:19

16 THE VIDEOGRAPHER: We are off the record at
17 1:32 p.m.

18 (Recess.)

19 THE VIDEOGRAPHER: We are on the record at
20 2:08 p.m.

02:08:00

21 BY MR. BLOCK:

22 Q Good afternoon, Dr. Brown.

23 A Mr. Block, how are you doing?

24 Q I -- I'm good.

25 Okay. So, you know, we -- just before the

02:08:12

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1 break, we had just a series of questions about some of
2 the sources quoted in your report, and I'm trying to
3 just pull back, again, the -- the paragraph where this
4 was discussed.

5 This is paragraph 8, page 7, from your expert 02:08:32
6 report, you know, marked Exhibit 64.

7 A Yes.

8 Q And, you know, we -- we had a series of
9 questions about them. And if you recall, my questions
10 focused on three features of H.B. 3293. One is the 02:08:46
11 fact that it excludes trans girls and women even if
12 they've had blockers. Two is that it includes trans
13 girls and women if they've gone through puberty and
14 suppressed their testosterone. And three is that it
15 has an across-the-board rule. And I asked you a series 02:09:09
16 of questions about those elements of it, and now I'm
17 going to turn to looking at the sources cited in
18 paragraph 8, with an eye towards those elements. So
19 that's not a question for you; that's just to orient
20 you for the next couple of questions. 02:09:27

21 MR. BLOCK: So if you could look in your
22 exhibit file, Exhibit 75, that should be a PDF of
23 Coleman -- of the first Coleman article. Coleman 2020.

24 (Exhibit 75 was marked for identification
25 by the court reporter and is attached hereto.) 02:09:46

1 THE WITNESS: Yes. By Doriane Coleman and
2 Michael Joyner and Donna L.

3 BY MR. BLOCK:

4 Q Yes. All right. So if we look at that
5 article -- if you could turn to page 130 of her 02:10:12
6 article. Let me know when you're there. It's near the
7 end.

8 A Still scrolling. Almost there.

9 All right. Page 130. Duke Journal of Gender
10 and Law Policy, Volume 27:69, 2020. 02:10:49

11 Q Yep. Okay.

12 Now, just to preface this, you know, this
13 article uses the phrase "category affirming" and
14 "category defeating."

15 Are you familiar with those terms? 02:11:01

16 A If I remember correctly, category affirming
17 applies to male and female. Is that correct?

18 Q So my understanding, which I'll represent to
19 you, is that category affirming means that the
20 participation is consistent with the purposes of having 02:11:20
21 a female category, and category defeating means
22 allowing someone to participate would sort of defeat
23 the purpose of having a female category.

24 So if -- does that ring a bell at all for you?

25 A Yes, it does. It does. 02:11:37

1 Q Okay. So if you look at the -- the paragraph
2 beginning "In high school" --

3 A Uh-huh.

4 Q -- "In high school intramural."

5 Do you see that? 02:11:48

6 A Yes, I do.

7 Q Okay. So it says (as read):

8 "In high school intramural, junior

9 varsity, and regular season play,

10 where institutional goals are 02:11:57

11 primarily related to health and

12 fitness and to the development of

13 social skills, unconditional inclusion

14 of gender diverse students according

15 to their gender identity rather than 02:12:06

16 their sex will usually be category

17 affirming."

18 Do you see that?

19 A I do.

20 Q Okay. So that sentence indicates that it 02:12:12

21 would be consistent with the female category according

22 to Coleman 2020 to have -- to allow trans girls to

23 participate in intramural, junior varsity and regular

24 season play without any medical interventions

25 whatsoever. Do you agree? 02:12:39

1 MR. FRAMPTON: Object to the form.

2 THE WITNESS: I'm looking at the sentence
3 after that, however, which has some exceptions, which
4 would include invitational and postseason
5 opportunities. 02:12:53

6 BY MR. BLOCK:

7 Q Yes. Is it your understanding that H.B. 3293
8 is limited to excluding trans girls from invitational
9 and postseason opportunities?

10 MR. FRAMPTON: Object to the form. 02:13:04

11 THE WITNESS: Yes, it is my understanding that
12 the law in West Virginia states that biological females
13 only compete in female sports.

14 BY MR. BLOCK:

15 Q Right. But not just -- not just the 02:13:22
16 invitational and postseason opportunities of female
17 sports; right?

18 MR. FRAMPTON: Same objection.

19 THE WITNESS: Yes, it is my understanding that
20 it is all parts of the sports. 02:13:31

21 BY MR. BLOCK:

22 Q Right. So the H.B. 3293 does not allow trans
23 girls to participate on girls' teams in the regular
24 season play of sports; correct?

25 MR. FRAMPTON: Object to the form. 02:13:46

1 THE WITNESS: I will trust your interpretation
2 on that.

3 BY MR. BLOCK:

4 Q Would you support a policy of allowing trans
5 girls to participate in regular season play? 02:14:01

6 MR. FRAMPTON: Object to the form and scope.

7 THE WITNESS: Inasmuch as biological males
8 have inherent athletic advantages over biological
9 females, I think the category should be retained.

10 BY MR. BLOCK: 02:14:19

11 Q Yeah, I know. I'm -- I'm sorry, I really just
12 need like a clear answer to my questions.

13 This article draws a distinction between
14 allowing trans girls to play in regular season play
15 versus in postseason opportunities. I'm just trying to 02:14:30
16 get an answer from you about whether you agree with
17 that distinction or not. So --

18 MR. FRAMPTON: Objection to the form that
19 misstates the article.

20 MR. BLOCK: Okay. 02:14:44

21 BY MR. BLOCK:

22 Q So --

23 MR. FRAMPTON: You can go ahead and answer.

24 BY MR. BLOCK:

25 Q So do you think that trans girls should not be 02:14:45

1 allowed to play on girls' teams for regular season
2 play?

3 MR. FRAMPTON: Object to the form.

4 Go ahead.

5 THE WITNESS: I think that whether it's 02:14:58
6 regular season, preseason, postseason, males have
7 inherent athletic advantages; therefore, we should
8 protect women's sports and men's sports.

9 BY MR. BLOCK:

10 Q So -- so that's a yes? 02:15:13

11 MR. FRAMPTON: Same objection.

12 THE WITNESS: I think you could take that as a
13 yes.

14 BY MR. BLOCK:

15 Q Thank you. 02:15:17

16 All right. Then if you go down, continuing in
17 the article, the paragraph that says -- let me find
18 this. All right. The paragraph above that begins with
19 "where combined." (As read):

20 Where combined teams or practices 02:15:44

21 coupled with sex segregated

22 competition cannot be -- cannot

23 accomplish institutional goals, the

24 accommodations approach detailed in

25 Part IIIC4 should be adopted." 02:15:55

1 And that cross references a section that I
2 don't think we need to turn to for purposes of this
3 question, but let me know if you disagree.

4 Then the -- then the paragraph continues,
5 so -- (as read):

02:16:08

6 "This will be the case" --

7 Meaning the accommodations approach should be
8 adopted.

9 (As read):

10 -- "in circumstances where sex

02:16:14

11 segregated teams and events remain

12 necessary to secure parity of

13 opportunity for females. Where the

14 accommodations approach is adopted,

15 trans students will train and compete

02:16:24

16 consistent with their gender identity

17 so long as their inclusion can be

18 relevantly conditioned. The NCAA

19 transgender policy is illustrative of

20 a hormonal condition in this category;

02:16:38

21 others that do not require

22 medicalization- such as handicaps,

23 offsets, and quotas- exist as more

24 appropriate models for the high school

25 sports space.

02:16:45

1 Do you see that?

2 A Yes, I see that.

3 Q Okay. So am I correct in saying that this
4 article points to the NCAA transgender policy as
5 illustrative of a model of allowing trans girls to 02:16:58
6 participate so long as their inclusion can be
7 relatively -- relevantly conditioned?

8 MR. FRAMPTON: Object to the form.

9 THE WITNESS: And I'm unclear what they mean
10 by "relevantly conditioned," so I don't know how I can 02:17:21
11 answer that.

12 BY MR. BLOCK:

13 Q Okay. Why do you think they're citing the
14 NCAA transgender policy?

15 A This is the old NCAA policy, not the current 02:17:35
16 NCAA policy, and the old NCAA policy did have a
17 statement about testosterone suppression.

18 Q So -- and so they are citing testosterone
19 suppression as an example of an accommodations approach
20 that should be used in circumstances for sex-segregated 02:18:00
21 teams and events remain necessary to secure parity of
22 opportunity for females; right?

23 MR. TRYON: Objection.

24 MR. FRAMPTON: Object to the form.

25 THE WITNESS: And again, what -- I'm still not 02:18:19

1 sure what you're asking me here.

2 BY MR. BLOCK:

3 Q Sure. I'm -- I'm asking, does this article
4 support a policy of -- of excluding trans girls and
5 women from all female athletic events, even if they 02:18:28
6 suppress testosterone after puberty?

7 MR. FRAMPTON: Same objection.

8 THE WITNESS: As I read it, this article is
9 kind of confusing on that.

10 MR. BLOCK: Okay. All right. I'll -- I'll 02:18:50
11 leave that article at that.

12 Let's next look at the Hilton and Lundberg
13 article, which I will cue up for you. For some reason,
14 Exhibit Share is being slow.

15 (Exhibit 76 was marked for identification 02:19:43
16 by the court reporter and is attached hereto.)

17 BY MR. BLOCK:

18 Q Okay. This should pop up on your exhibit list
19 as Exhibit 76.

20 A All right. Exhibit 076 - Hilton - Transgender 02:20:00
21 Women...?

22 Q Yes.

23 A Okay.

24 Q So, you know, we discussed this, you know,
25 as -- you -- you cited this as an exam- -- as, 02:20:12

1 potentially, an example of an article supporting a
2 categorical rule across sports; correct?

3 A That is correct.

4 Q Okay. And you cited this, potentially, as an
5 example of an article supporting an exclusion of trans 02:20:29
6 girls and women even if they've suppressed
7 testosterone; right?

8 MR. FRAMPTON: Same -- object to the form.

9 THE WITNESS: Yes.

10 BY MR. BLOCK: 02:20:40

11 Q Okay. Great.
12 So let's look on page 211 of this article.
13 Let me know when you're there.

14 A All right. Yep, page 211.

15 Q Great. All right. Sorry. One second. 02:21:08
16 All right. If you look on the right-hand
17 column, the second -- the third sentence there, where
18 it begins, "It is also," do you see that?

19 A So page 211, right-hand column?

20 Q Second full paragraph, third sentence. 02:21:44

21 A Yes. "It is also important to recognize..."

22 Q Yeah. So that says (as read):
23 "It is also important to recognize the
24 performance in most sports may be
25 influenced by factors outside muscle 02:21:58

1 mass and strength, and the balance
2 between inclusion, safety and fairness
3 therefore differs between sports."

4 Do you see that?

5 A Yes. 02:22:06

6 Q Okay. Does that refresh your recollection at
7 all about whether or not this article advocates for a
8 single across-the-board rule?

9 MR. FRAMPTON: Object to the form.

10 THE WITNESS: It doesn't make a clear 02:22:21
11 statement one way or the other, necessarily.

12 BY MR. BLOCK:

13 Q Okay. So let's continue reading.
14 If you go to the final full paragraph.

15 A Okay. 02:22:47

16 Q The second sentence beginning with
17 "regardless."

18 A Okay.

19 Q Okay. It says (as read):

20 "Regardless of what the future will 02:22:54

21 bring in terms of revised transgender
22 policies, it is clear that different
23 sports differ vastly in terms of
24 physiological determinants of success,
25 which may create safety considerations 02:23:05

1 and may alter the importance of
2 retained performance advantages.
3 Thus, we argue against universal
4 guidelines for transgender athletes in
5 sport and instead propose that each 02:23:17
6 individual sports federation evaluate
7 their own conditions for inclusivity,
8 fairness and safety."

9 Do you see that?

10 A Yes, I do. 02:23:26

11 Q Okay. So is it fair to say that this article,
12 they state that they argue against universal guidelines
13 for transgender athletes in sport?

14 MR. FRAMPTON: Object to form.

15 THE WITNESS: Yes, that would be a correct 02:23:42
16 statement based on what is written right there.

17 BY MR. BLOCK:

18 Q Okay. So based on what is written right
19 there, they do not support a single categorical rule
20 that applies equally to all sporting events; correct? 02:23:52

21 MR. FRAMPTON: Same objection.

22 THE WITNESS: Based on that sentence, that is
23 correct.

24 BY MR. BLOCK:

25 Q Okay. Let's go to page 209 of this. 02:23:59

1 At the top of the page, on the left-hand
2 column.

3 A Okay.

4 Q Okay. The paragraph beginning -- I mean, not
5 the paragraph. The sentence beginning with the word 02:24:28
6 "however."

7 Do you see that --

8 A Yes.

9 Q -- right in the middle of that first
10 paragraph? 02:24:35

11 All right. It says (as read):

12 "However, given the plausible
13 disadvantages with testosterone
14 suppression mentioned in this section,
15 together with the more marginal male 02:24:43

16 advantage in endurance-based sports,
17 the balance between inclusion and
18 fairness is likely closer to
19 equilibrium in weight-bearing

20 endurance-based sports compared with 02:24:55
21 strength-based sports where the male
22 advantage is still substantial.

23 Do you see that?

24 A Yes, I do.

25 Q All right. So -- and feel free to read more 02:25:03

1 of that paragraph of which this is an excerpt, but is
2 it fair to say that the authors of this article are
3 saying there is a substantial advantage for
4 strength-based sports for transgender women who
5 suppress testosterone, but when it comes to -- when it 02:25:25
6 comes to weightbearing endurance-based sports, the
7 balance between inclusion and fairness is likely closer
8 to equilibrium?

9 MR. FRAMPTON: Object to the form.

10 MR. TRYON: Objection. 02:25:45

11 THE WITNESS: I think you need to take that
12 particular statement in context of the other
13 information presented in this article in which the
14 authors clearly demonstrate a 10 to 13 percent
15 advantage in endurance performance for males compared 02:25:57
16 to females relative to the 30 to 60 percent -- I guess
17 I could look up at the table and tell you exactly the
18 percent -- that they're showing for advantage in
19 strength-based sports.

20 And then if you look at the para- -- the 02:26:10
21 sentence right above what you've quoted, they mention
22 about unknown effects on vari- -- a number of the
23 determinants of endurance performance.

24 And so I really can't say too much beyond that
25 that is kind of a speculative statement. 02:26:26

1 BY MR. BLOCK:

2 Q I see. So if you look on page 208, there's a
3 discussion about -- on the right-hand column, there's a
4 discussion about hemoglob- -- hemoglobin levels being
5 reduced with once testosterone is suppressed; correct? 02:26:48

6 A Yes. Second paragraph down, page 208, starts
7 "Circulating hemoglobin."

8 Q Right. And if you -- and then if you look at
9 the next paragraph, it also says (as read):

10 "The typical increase in body fat 02:27:07
11 noted in transgender women may also be
12 a disadvantage for sporting activities
13 (e.g. running) where body weight (or
14 fat distribution) presents a marginal
15 disadvantage." 02:27:21

16 Right?

17 A Correct.

18 Q Okay. All right. I'll leave it at that
19 article.

20 We already -- you mentioned the World Rugby 02:27:36
21 policies, and you already noted that World Rugby allows
22 girls and women -- trans girls and women to -- I guess
23 I'll start over.

24 You already mentioned that World Rugby allows
25 trans women to participate in women's rugby if they've 02:27:55

1 had puberty blockers and, therefore, not experienced
2 endogenous puberty; right?

3 MR. FRAMPTON: Object to form.

4 Go ahead.

5 I'm sorry. I couldn't tell if you finished 02:28:11
6 the question.

7 Go --

8 MR. FRAMPTON: But objection.

9 Go ahead and answer.

10 THE WITNESS: All right. That is my 02:28:14
11 understanding of what World Rugby has stated.

12 BY MR. BLOCK:

13 Q Okay. So you don't need me to put on the
14 screen a -- a copy of the World Rugby policy to -- to
15 point out that provision, do you? 02:28:27

16 A I would ask you to put it on the screen so we
17 can evaluate if they cite any sources to make that
18 statement.

19 Q Sure. Let's put that -- let's put it on the
20 screen. One second. 02:28:40

21 MS. DUPHILY: Did you say you wanted to put
22 something on the screen or --

23 MR. BLOCK: No, I'll take -- I'll take care of
24 it. I'm just looking up which specific one I want to
25 put up. 02:29:03

1 MS. DUPHILY: Okay.

2 (Exhibit 77 was marked for identification
3 by the court reporter and is attached hereto.)

4 BY MR. BLOCK:

5 Q All right. So this is going to pop up as 02:29:22
6 marked as Exhibit 77. Let me know when you see it.

7 A All right. Exhibit 077 - World Rugby
8 Transgender...?

9 Q Yes. All right. And you see it says, "Can
10 transgender women play rugby?" right? 02:29:58

11 A Yes.

12 Q Okay. And the first bullet point says (as
13 read):

14 "Transgender women who transitioned
15 pre-puberty and have not experienced 02:30:08
16 the biological effects of testosterone
17 during puberty and adolescence can
18 play women's rugby (subject to
19 confirmation of medical treatment and
20 the timing thereof). 02:30:18

21 Right?

22 A Yes, I see that.

23 Q Okay. The third bullet point also says (as
24 read):

25 "Transgender women can play 02:30:22

1 mixed-gender non-contact rugby."

2 Right?

3 A Yes.

4 Q Okay. And if we -- scroll down.

5 Do you know -- do you know if World Rugby at 02:31:00
6 all talks about any advantages for -- between boys and
7 girls before puberty?

8 A I don't recall this document from World Rugby
9 evaluating differences between boys and girls
10 prepuberty. 02:31:25

11 Q Can you recall any document from World Rugby
12 evaluating that?

13 A Sitting here right now, I cannot recall that
14 World Rugby has evaluated and cited sources on
15 differences before puberty or the effect of puberty 02:31:45
16 blockers on those differences.

17 Q Okay. All right.

18 So that's -- that's World Rugby. So we can
19 put that down as not supporting a policy of excluding
20 trans girls and women from participating in girls and 02:32:04
21 women's sports if they've had puberty blockers;
22 correct?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: I think it's important that
25 that's specific to rugby. 02:32:18

1 BY MR. BLOCK:

2 Q I -- I understand. But the -- the answer to
3 my question is correct; right?

4 MR. FRAMPTON: Object to the form.

5 THE WITNESS: Isn't that what I said? 02:32:26

6 BY MR. BLOCK:

7 Q No. You -- you've made a different statement,
8 so I -- I just -- I need you to answer my question
9 before you make a different statement.

10 So it's fair to say that -- that 02:32:35

11 World Rugby -- this World Rugby policy does not support
12 excluding trans girls and women from girls and women's
13 teams in rugby if they have been on hormone blockers
14 and not experien- -- puberty blockers and not
15 experienced endogenous puberty; correct? 02:32:58

16 MR. FRAMPTON: Object to the form.

17 THE WITNESS: Yes, that is correct, as you
18 stated, the World Rugby statement is about rugby.

19 (Exhibit 78 was marked for identification
20 by the court reporter and is attached hereto.) 02:33:10

21 BY MR. BLOCK:

22 Q Okay. All right. Now let's look at the
23 Harper 2021 article.

24 All right. This is going to appear on your
25 screen as Exhibit 78. Please let me know once you have 02:33:36

1 it.

2 A All right. Exhibit 078 - Harper.

3 Q All right. See if I can grab -- all right.

4 So if you go to page 7. Let me know when you're there.

5 A All right. Page 7 of 9. 02:34:17

6 Q Yeah. So if you look at the first full
7 paragraph, beginning with "in contrast," do you see
8 that?

9 A Yes.

10 Q Okay. It says (as read): 02:34:35

11 "In contrast to strength-related data,

12 blood cell findings revealed a

13 different time course of change.

14 After 3-4 months on GAHT" -- which is

15 gender-affirming hormone therapy -- 02:34:48

16 "the HCT or Hgb levels of transwomen

17 matched those of cisgender women, with

18 levels remaining stable within the

19 'normal' female range for studies

20 lasting up to 36 months." 02:35:02

21 Do you see that?

22 A Yes, I do.

23 Q Okay. And then if you look at the bottom of

24 the paragraph, so that's the top of the second column,

25 it says (as read): 02:35:19

1 "Given this, and that the changes in
2 Hgb/HCT follow a different time course
3 than strength changes, sport-specific
4 regulations for transwomen in
5 endurance versus strength sports may 02:35:30
6 be needed."

7 Do you see that?

8 A Yes, I see that.

9 Q Okay. So is this Harper article advocating
10 for a single categorical rule that doesn't distinguish 02:35:41
11 between endurance sports and strength sports?

12 MR. FRAMPTON: Object to the form.

13 THE WITNESS: That would appear to be correct.

14 BY MR. BLOCK:

15 Q Okay. Now, if you look at the bottom right, 02:35:53
16 so the last paragraph, bottom right of page 7, it says
17 (as read):

18 "Although the data we present are
19 meaningful, the effects of GAHT on
20 these parameters, or indeed athletic 02:36:15
21 performance in transgender people who
22 engage in training and competition,
23 remain unknown."

24 Do you see that?

25 A Yes. 02:36:23

1 Q Okay. Great.

2 And then if we move down -- actually, never
3 mind. I'll come -- I'll come back to this article.
4 I -- I have one more to quote for you, and then I'll
5 come back to this article. 02:36:44

6 If you go to page 8, at the very end, the
7 second to last sentence.

8 A Is that the one that starts "Whether
9 transgender"?

10 Q Yes. It says (as read): 02:36:57

11 Whether --

12 A Okay.

13 Q (As read):

14 "Whether transgender and cisgender
15 women can engage in meaningful sport, 02:37:02
16 even after gender-affirming hormone
17 therapy, is a highly debated question.

18 However, before this question can be
19 answered with any certainty, the
20 intricacies and complexity of factors 02:37:12

21 that feed into the development of
22 high-performance athletes warrant
23 further investigation of attributes
24 beyond those assessed herein."

25 Do you see that? 02:37:23

1 A I see that.

2 Q Okay. So do the authors of this article
3 believe that the information they present here allows a
4 policy maker to determine with any certainty whether
5 transgender and cisgender women can engage in 02:37:38
6 meaningful sport after GAHT?

7 MR. FRAMPTON: Object to the form.

8 MR. TRYON: Objection.

9 THE WITNESS: The authors state that that
10 question cannot be answered. 02:37:52

11 BY MR. BLOCK:

12 Q Okay. And you -- do you think the question
13 can be answered?

14 MR. FRAMPTON: Object to the form.

15 Go ahead. 02:38:05

16 THE WITNESS: I think that the question can be
17 answered sufficiently that we should not do away with
18 existing policies until further information
19 demonstrating the removal of biological male advantage
20 has been obtained. 02:38:18

21 BY MR. BLOCK:

22 Q Okay. Let me ask that again.

23 So the -- the -- the -- because I'm just not
24 sure it came out clearly.

25 So the authors of this article say -- I'm just 02:38:32

1 going to read it again for the record. (As read):

2 "Whether transgender and cisgender
3 women can engage in meaningful sport,
4 even after gender-affirming hormone
5 therapy, is a highly debated question. 02:38:47

6 However, before this question can be
7 answered with any certainty, the
8 intricacies and complexity of factors
9 that feed into the development of
10 high-performance athletes warrant 02:38:56
11 further investigation of attributes
12 beyond those assessed herein."

13 Do you agree or disagree with that statement?

14 MR. FRAMPTON: Object to the form.

15 Go ahead. 02:39:08

16 THE WITNESS: So what is the question I'm
17 agreeing with or not agreeing with?

18 BY MR. BLOCK:

19 Q I -- I believe the question is that until --
20 until the intricacies and complexity of factors that 02:39:24
21 feed into the development of high-performance
22 athletes -- let me ask the question again in a -- in a
23 clearer way.

24 Do you -- the -- the question is, do you -- is
25 the information presented in this article sufficient 02:39:37

1 for a policy maker to answer with any certainty whether
2 transgender and cisgender women can engage in
3 meaningful sport after gender-affirming hormone
4 therapy?

5 MR. FRAMPTON: Same objection. 02:39:55

6 Go ahead.

7 THE WITNESS: What is meant by "meaningful
8 sport"?

9 BY MR. BLOCK:

10 Q What -- what do you think is meant by 02:39:59
11 "meaningful sport"?

12 A I asked first.

13 Q So you can't answer the question without
14 knowing more what they mean by "meaningful sport"?

15 A Yes, I would like know what they mean more by 02:40:19
16 "meaningful sport."

17 Q Okay. Do you think that -- all right. We can
18 come back to this article later too.

19 So a question about the Hamilton article. You
20 have several times, if I'm right, referenced a 02:40:45
21 statement in the Hamilton article about how women have
22 a right to compete in a protected category; is that
23 right?

24 A Yes, I have stated that.

25 Q Okay. Is there any other portion of the 02:41:02

1 Hamilton article that you remember?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: I remember there was a lot of

4 statements in the Hamilton article that seemed

5 confusing and contradictory. 02:41:18

6 BY MR. BLOCK:

7 Q What do you mean by "confusing and

8 contradictory"?

9 A Again, if I'm remembering the article

10 correctly, it seemed like they would make a statement 02:41:30

11 in one place about how trans women retain significant

12 advantages and then in another statement state

13 something about how those advantages wouldn't influence

14 sport performance and then come back and state that

15 those are advantages that influence sport performance. 02:41:48

16 I'm -- I'm grossly generalizing here, but that

17 was my impression because I read a lot of the article.

18 Q Okay. Which portions of the article did you

19 decide to cite in your report?

20 MR. FRAMPTON: Object to the form. 02:42:06

21 THE WITNESS: The -- if I'm remembering

22 correctly, that is a direct quote from Hamilton, that

23 cisgender women deserve to compete in a protected

24 category, and I thought that was a very clear statement

25 from that article. 02:42:22

1 BY MR. BLOCK:

2 Q Okay. But -- but you had said before that
3 several statements in the article are contradictory;
4 right?

5 A Yes. 02:42:30

6 Q Okay. And in your report, you quoted the
7 statements that you believe support excluding trans
8 girls and women from female sports; is that right?

9 MR. FRAMPTON: Object to the form.

10 THE WITNESS: Yes, I quoted from Hamilton 02:42:56
11 those parts that -- yeah, as you said.

12 BY MR. BLOCK:

13 Q Okay. But you didn't quote any of the
14 portions of the Hamilton article that are contradictory
15 with that; right? 02:43:19

16 MR. FRAMPTON: Object to the form.

17 THE WITNESS: I didn't put quotations in there
18 that were confusing and contradictory to other
19 quotations in the article.

20 BY MR. BLOCK: 02:43:28

21 Q Well, so if there's two quotations in the
22 article, one of them supports allowing trans women to
23 participate and the other one opposes allowing
24 transgender women to participate, you decided to cite
25 to the quote that opposes allowing trans women to 02:43:42

1 participate; right?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: Yes, that is what I quoted.

4 BY MR. BLOCK:

5 Q Okay. And why did you choose to cite the 02:43:55
6 portions that you believe support opposing -- I'll ask
7 again.

8 Why did you choose to cite to the portions
9 that would support excluding transgender women instead
10 of the portions of the article that you think support 02:44:08
11 including them?

12 MR. FRAMPTON: Object to the form.

13 THE WITNESS: Because as I read the article
14 and evaluated the information, I thought it was a clear
15 statement opposing the inclusion of trans women in 02:44:22
16 women's sports.

17 (Exhibit 79 was marked for identification
18 by the court reporter and is attached hereto.)

19 BY MR. BLOCK:

20 Q Okay. So let's look at the -- let's look at 02:44:28
21 the article.

22 So this will appear on your screen in a second
23 as Exhibit 79. Let me know when it appears.

24 A All right. Exhibit 079 - Hamilton.

25 Q Okay. Is this article that you were 02:45:19

1 referencing when you cited to the 2021 Hamilton
2 article?

3 A Yes. I think I also refer to it in my
4 declaration as the FIMS 2021 statement.

5 Q Yeah. What -- what is FIMS? 02:45:33

6 A It's the International Sports Medicine
7 Federation. I think it's French, is why it's like
8 Federation International Medicine Sport. That's why it
9 becomes FIMS.

10 Q Uh-huh. 02:45:46

11 A Beyond that, it's just a -- it's a
12 professional organization of people interested in
13 sports medicine.

14 Q Is -- in your -- your report, you say that the
15 statement is "signed by more than 60 sports medicine 02:46:01
16 experts from prestigious institutions around the
17 world"; is that right?

18 A What page is that on my declaration so I make
19 sure I'm agreeing to a number that --

20 Q Sure. It's paragraph 167, which is page 56 of 02:46:16
21 the PDF. And it's page 51 of the bottom pagination.

22 A All right. Yes, that is what I stated in my
23 declaration.

24 Q Okay. So the views expressed by this body,
25 you think, are entitled to significant weight; right? 02:46:36

1 MR. FRAMPTON: Object to the form.

2 THE WITNESS: It is an -- it is a statement
3 from an organization that is, you know, a respected
4 organization.

5 BY MR. BLOCK: 02:46:58

6 Q Okay. If you turn to page 2 of this, so
7 page 1402, at the top left, there's a little box that
8 says "Key Points."

9 Do you see that?

10 A Yes. 02:47:08

11 Q Okay. Key Points. And the first point there
12 is (as read):

13 "The use of testosterone concentration
14 limits of 5 nmol/L in transwomen and
15 DSD women athletes is a justifiable
16 threshold based on the best available
17 scientific evidence."

02:47:19

18 Did I read that right?

19 A You read that correctly.

20 Q And so of the points in this article 02:47:29
21 highlighted as the key points, this is the first one;
22 right?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: Yes, that appears to be the
25 first highlighted key point.

02:47:39

1 BY MR. BLOCK:

2 Q Okay. But you didn't choose to mention this
3 first key point in your report; right?

4 A That is correct.

5 Q Okay. Why not? 02:47:49

6 A I disagree with that key point.

7 Q Okay. So you only highlighted -- you only
8 cited to the portions of this article that you agreed
9 with; right?

10 MR. FRAMPTON: Object to the form. 02:47:58

11 THE WITNESS: I cited the information that I
12 agree with after evaluating the other scientific
13 information.

14 BY MR. BLOCK:

15 Q Let's go to 1409. 02:48:22

16 Do you see that?

17 A Yes.

18 Q Okay. So the third bullet point here, when we
19 get to -- this is -- I'm sorry, under -- this whole
20 section of bullet points is under the subsection 5.7 02:48:41

21 "FIMS Consensus Statements for the Integration of DSD
22 Women and Transwomen Athletes into Elite Female Sport";
23 right?

24 A That is correct.

25 Q All right. So based on the foregoing 02:48:53

1 information discussed in the article, these are the
2 consensus statements that FIMS agreed upon; right?

3 A That's a reasonable conclusion, yes.

4 Q Okay. So the third bullet point on the
5 right-hand column is (as read):

02:49:13

6 "Transwomen have a (sic) right to
7 compete in sports. However, cisgender
8 women have the right to compete in a
9 protected category."

10 Is that right?

02:49:26

11 A That's correct.

12 Q Okay. And this bullet point is a bullet point
13 that you included in your report; right?

14 A Correct.

15 Q Okay. Do you know if you included any of the
16 other bullet points in your report?

02:49:33

17 A I don't think I included any of the other
18 bullet points.

19 Q Okay. So let's look at some of those other
20 bullet points.

02:49:46

21 If you go two bullet points down from the --
22 the one we just looked at, it says (as read):

23 "As each sport can vary greatly in
24 terms of physiological demands, we
25 support the view held also by others

02:49:58

Page 232

1 BY MR. BLOCK:

2 Q And then two more bullet points down, it says
3 (as read):

4 "The use of serum testosterone
5 concentrations as the primary 02:51:17
6 biomarker to regulate the inclusion of
7 athletes into male and female
8 categories is currently the most
9 justified solution as it is supported
10 by the available scientific literature 02:51:27
11 and should be implemented at the elite
12 level, where there is an emphasis on
13 performance enhancement."

14 Did I read that right?

15 A Yes, you read that correctly. 02:51:38

16 Q Okay. And that's -- that's similar to the key
17 point that we talked about before, on the second page;
18 right?

19 A That is similar to that previous key point.

20 Q Okay. And then if you turn the page, the 02:51:46
21 first full -- fir- -- excuse me -- the first full
22 bullet point at the top, you know, again, is --
23 essentially restates the -- the key point that we
24 discussed before; is that right?

25 MR. FRAMPTON: Same objection. 02:52:04

1 Go ahead.

2 THE WITNESS: Yes. That reiterates the
3 5 nmol/L threshold for testosterone.

4 BY MR. BLOCK:

5 Q Okay. And then the sentence also says that 02:52:14
6 that threshold may be modified as new evidence arises
7 for an event or sport-specific concentrations; is that
8 right?

9 A Yes, that is what it says.

10 Q Okay. And so -- so that -- that bullet point 02:52:28
11 and the other bullet point we looked at about the use
12 of serum testosterone and the other bullet point about
13 having individual policies for individual sports are
14 bullet points that you disagreed with; right?

15 A That is correct. 02:52:49

16 Q Okay. And because you disagreed with them,
17 you did not include them in your report?

18 MR. FRAMPTON: Object to the form.

19 Go ahead.

20 THE WITNESS: That is correct. 02:53:01

21 BY MR. BLOCK:

22 Q Okay. But at least according to this
23 document, the -- all the authors of this statement had
24 agreed on those bullet points as consensus statements;
25 right? 02:53:19

1 MR. FRAMPTON: Object to the form.

2 THE WITNESS: Assuming that the authors, you
3 know, agreed to it with their signature, that is a
4 reasonable assumption.

5 BY MR. BLOCK: 02:53:31

6 Q Okay. Great.

7 And actually -- in fact -- one second.

8 All right. If you look at page 1403, it
9 says -- at the bottom of that first paragraph, do you
10 see where it says "all statements"? 02:54:16

11 A The bottom of which paragraph?

12 Q Sorry. On the right-hand column, on
13 page 1403, under the "Methods" section, do you see
14 that? The paragraph begins with -- with "here."
15 "Here, we present." 02:54:37

16 A Yes.

17 Q Okay. So the last sentence -- the last two
18 sentences say (as read):

19 "All statements received unanimous
20 approval by all named authors except 02:54:48
21 for the statement on the testosterone
22 limit of 5 nmol/L, which received
23 majority approval and the voting
24 result is included in this (sic)
25 article." 02:54:59

1 Do you see that?

2 A Yes, I see that.

3 Q All right. So let's go down to what the
4 voting results were for that.

5 Okay. It's actually on the bullet points that 02:55:20
6 we looked at before, on 1410.

7 A On page 1410?

8 Q Uh-huh.

9 A All right.

10 Q Okay. So beginning with -- so the first -- 02:55:38
11 the second full bullet point, it says (as read):

12 "The statement on the testosterone
13 concentration threshold for transwomen
14 and DSD women athletes was the only
15 point of contention for the FIMS 02:55:48

16 Panel. All 70 authors voted, of whom
17 87% were in favour of the 5 nmol/L
18 threshold, 2% of the authors were in
19 favour of a threshold of 8 nmol/L, 2%
20 were in favour of a threshold around 02:56:04

21 the upper testosterone concentration
22 of normal healthy females of
23 0.2-1.7 nmol/L, and 8% of authors were
24 in favour of no change to the limit
25 until further evidence was acquired." 02:56:18

1 Do you see that?

2 A Yes, I see that.

3 Q Okay. So -- so based on this paragraph, it
4 appears that none of the 70 authors supported a policy
5 of prohibiting trans women from participating, you 02:56:35
6 know, regardless of how low they suppressed their
7 circulating testosterone levels; right?

8 MR. FRAMPTON: Object to the form.

9 THE WITNESS: Can you restate the question?

10 BY MR. BLOCK: 02:56:58

11 Q Sure. Did any of the 70 au- -- 70 authors
12 vote in favor of prohibiting trans women completely
13 from prohibiting -- from -- from participating in
14 women's sports regardless of how low they -- they
15 lowered their levels of circulating testosterone? 02:57:15

16 MR. FRAMPTON: Same objection.

17 THE WITNESS: I would really like to read the
18 article more and not just look at this particular
19 statement on their decision on what they thought were
20 acceptable testosterone levels. 02:57:27

21 BY MR. BLOCK:

22 Q Okay. But based on this paragraph, it appears
23 that none of the 70 authors supported a policy
24 analogous to H.B. 3293; right?

25 MR. FRAMPTON: Same objection. 02:57:46

1 THE WITNESS: And this is another example of
2 something that is confusing and contradictory to me, is
3 when they say that cisgender women deserve a protected
4 category and then have this kind of a statement.

5 BY MR. BLOCK: 02:57:57

6 Q Well, isn't one way to reconcile it that it's
7 possible to have a protected category for cisgender
8 women if appropriate conditions are placed on the
9 participation of trans women?

10 MR. FRAMPTON: Object to the form. 02:58:17

11 THE WITNESS: My understanding of the
12 intention of the authors is then it would no longer be
13 a protected category.

14 BY MR. BLOCK:

15 Q Well, it would be protected from participation 02:58:24
16 by cisgender men or anyone else with circulating levels
17 of testosterone over the threshold limit; right?

18 MR. FRAMPTON: Same objection.

19 THE WITNESS: Within the -- the field, a
20 protected category of women typically means biological 02:58:38
21 women.

22 BY MR. BLOCK:

23 Q Okay. Let's look at the next document.

24 All right. And, actually, we already marked
25 this one as an exhibit. This is the women's policy 02:58:57

1 briefing book. So this is Exhibit 69, if you could
2 pull it up again.

3 A All right. Women's Sports Policy Working
4 Group, Briefing Book?

5 Q Yes. 02:59:21

6 All right. If you look at page 15.

7 A All right. Page 15.

8 Q So at the -- the top, you can see this is
9 their Proposed Amendment to the Title IX Regulations.

10 Do you see that? 03:00:04

11 A Yes.

12 Q Okay. So if we scroll down to subsection C,
13 Treatment of Transgender Athletes, do you see that?

14 A Yes.

15 Q Okay. So -- so subsection (c)(1) says (as
16 read): 03:00:12

17 Because trans girls/women who have not

18 begun male puberty do not have

19 significant male linked -- male

20 sex-linked advantages, they shall be 03:00:24

21 included in girls' and women's sports

22 without conditions or limitations.

23 Do you see that?

24 A I see that.

25 Q All right. So to the extent that H.B. 3293 03:00:33

1 prohibits trans girls and women from participating in
2 women's sports, even if they have not experienced
3 endogenous male puberty, the authors of this briefing
4 book would disagree with H.B. 3293, to that extent?

5 MR. FRAMPTON: Object to the form. 03:00:56

6 THE WITNESS: I don't think that I can speak
7 on behalf of these authors for what they agree or
8 disagree with regarding H.B. 323 (sic) -- whatever it
9 is. Sorry.

10 BY MR. BLOCK: 03:01:12

11 Q Okay. So do you think that subsection (c)(1)
12 is consistent with H.B. 3293?

13 MR. FRAMPTON: Object to the form.

14 THE WITNESS: Well, (c)(1) says they shall be
15 included in girls and women's sports. 03:01:28

16 BY MR. BLOCK:

17 Q So the answer to my question is yes?

18 MR. FRAMPTON: Object to the form.

19 BY MR. BLOCK:

20 Q I mean -- no, I'll just ask that again. 03:01:40

21 Can you just give me a "yes" or "no" answer so
22 I don't have to worry about getting a clean transcript?

23 So just -- my question is, is section (c)(1)
24 consistent with H.B. 3293?

25 MR. FRAMPTON: Same objection. 03:01:52

1 Go ahead.

2 THE WITNESS: I think there is an
3 inconsistency there.

4 BY MR. BLOCK:

5 Q Okay. Thank you. 03:02:02

6 If you look at section (c)(3), it says (as
7 read):

8 "Trans girls/women who have
9 experienced all or part of male
10 puberty and who have sufficiently 03:02:14

11 mitigated their male sex-linked
12 advantages – through surgery and/or
13 gender affirming hormones consistent
14 with the rules of their international
15 federations – may participate in 03:02:25

16 girls'/women's sport without
17 additional conditions or limitations."

18 Do you see that?

19 A I see that.

20 Q Okay. And so section (c)(3) is also 03:02:32
21 inconsistent with H.B. 3293; correct?

22 MR. FRAMPTON: Same objection.

23 Go ahead.

24 THE WITNESS: I would say that it may or may
25 not, apparently depending on the rules of the 03:02:44

1 international federations.

2 BY MR. BLOCK:

3 Q Okay. So are there any international
4 federations, aside from rugby, that categorically
5 exclude girls and women who are transgender from 03:02:58
6 participating in the female category?

7 A There have been a lot of changes in those
8 lately and a lot of organizations debating that, and so
9 I can't say for certain whether there is or is not an
10 organization or no organizations that specifically 03:03:16
11 state that.

12 Q But you consider yourself an expert on this
13 issue, don't you?

14 A Yes. And there's a lot of organizations that
15 are in process of making decisions, and so I can't say 03:03:29
16 what their decisions are when they have not released
17 their decisions.

18 Q All right. Well, has any organization
19 released a decision excluding trans girls and women
20 from participating in the female category, even if they 03:03:43
21 have lowered their circulating testosterone, besides
22 rugby?

23 A I know swimming had a recent change, and I
24 can't remember the exact wording on that, and -- again,
25 that's what I can remember right now at this moment. 03:04:10

1 Q All right. Does -- did the recent change from
2 swimming categorically exclude trans girls and women
3 from participating in women's swimming events?

4 MR. FRAMPTON: Objection to the form.

5 THE WITNESS: I would need to look at the 03:04:28
6 document to be sure.

7 BY MR. BLOCK:

8 Q Isn't it true that the new swimming policy
9 extended the period of hormone suppression to three
10 years? Does that sound familiar to you? 03:04:46

11 A As you say it, it sounds familiar, but I can't
12 be sure if I'm remembering it because you told me I
13 should remember it.

14 Q Okay. Well, we'll -- we'll get you a -- a
15 copy of that. 03:05:05

16 And then subsection (4) says (as read):

17 "Trans girls/women who have
18 experienced all or part of male
19 puberty and who have not, or only
20 insufficiently, mitigated their male 03:05:19
21 sex-linked advantages according to the
22 international federation standards in
23 their sport may be accommodated within
24 girls'/women's sports but not in
25 head-to-head competition with female 03:05:31

1 athletes."

2 Do you see that?

3 A I see that.

4 Q Okay. And so that also is inconsistent with

5 H.B. 3293; correct? 03:05:39

6 MR. FRAMPTON: Object to the form.

7 THE WITNESS: This is somewhat of a confusing

8 statement because how is somehow included in women's

9 sports if they're not competing head-to-head with

10 women. 03:05:50

11 BY MR. BLOCK:

12 Q Well, there's scrimmages and, you know, team

13 practices and other events that are not for trophies.

14 Those are some examples; right?

15 A And I would ask, are they really included, 03:06:07

16 then, if they can only participate in limited aspects

17 of the sport.

18 Q Okay. But my question is whether or not this

19 is consistent with H.B. 3293.

20 And so section (c)(4) is inconsistent with 03:06:22

21 H.B. 3293; correct?

22 MR. FRAMPTON: Object to the form.

23 THE WITNESS: I would need to refer back to

24 the bill to be certain, but I think that your statement

25 is, yes, this is an inconsistency. 03:06:39

1 BY MR. BLOCK:

2 Q Okay. Let's go back to your report. So
3 that's Exhibit -- oh, I'm sorry, I just want to make
4 sure we got through all of the sources cited in that
5 paragraph of your report. So let me -- let's turn to 03:07:09
6 your report and just make sure we've -- we've looked at
7 all of them because I don't want to leave any out.

8 I believe -- is this on page 8? Or
9 paragraph 8? It's paragraph 8, I believe. On page 7,
10 paragraph 8. 03:07:30

11 Let me know when you're there.

12 A I'm there.

13 Q Okay. So we looked at Coleman 2020; correct?

14 A Yes.

15 Q And Hilton and Lundberg 2021; correct? 03:07:42

16 A Yes.

17 Q And World Rugby?

18 A Yes.

19 Q And Harper 2021?

20 A Yes. 03:07:53

21 Q And Hamilton 2021?

22 A Yes.

23 Q And a briefing book prepared by the Women's
24 Sports Policy Working Group 2021; right?

25 A Yes. 03:08:00

1 Q Okay. So now that we've looked at all of
2 those, do any of them advocate in favor of excluding
3 girls and women who are trans from participating in
4 women's sports if they have had puberty blockers and
5 not gone through endogenous puberty? 03:08:17

6 MR. FRAMPTON: Object to the form.

7 Go ahead.

8 THE WITNESS: I still think that that
9 statement from Hamilton, where they say women deserve a
10 protected category, with the understanding that 03:08:24
11 protected category, as it is used in the field, means
12 biological women only.

13 BY MR. BLOCK:

14 Q Okay. But other portions of the -- the
15 Hamilton statement don't support that; correct? 03:08:39

16 A Correct.

17 Q Okay. So after reviewing all these sources,
18 let's see, how -- how many of them do we think support
19 excluding girls and women who are transgender if
20 they've experienced puberty and then suppressed their 03:09:04
21 testosterone?

22 MR. FRAMPTON: Object to the form.

23 THE WITNESS: So as we've reviewed these
24 sitting here, I would say Hamilton supports it, with
25 the caveat that it is, at times, contradictory. 03:09:20

1 BY MR. BLOCK:

2 Q Okay. And did any of these sources support
3 having a single across-the-board rule that applied to
4 all sporting events?

5 MR. FRAMPTON: Object to the form. 03:09:37

6 THE WITNESS: Again, the same statement with
7 Hamilton seems to state that, with the caveat that, I
8 guess, you and I can agree there is some contradiction
9 or confusion there.

10 BY MR. BLOCK: 03:09:51

11 Q Okay. Let's look at page 4 of your report.

12 A All right. Page 4, Overview.

13 Q Yes. If you look at the second bullet point.

14 A Okay.

15 Q It says (as read): 03:10:13

16 "Biological male physiology is the
17 basis for the performance advantage
18 that men, adolescent boys, or male
19 children have over women, adolescent
20 girls, or female children in almost
21 all athletic events."

22 Did I read that right? 03:10:25

23 A Yes, you read that correctly.

24 Q Okay. And so your expert opinions about

25 transgender women are based on the premise that 03:10:34

1 transgender women who have not had any gender-affirming
2 medical interventions will have the same physiology as
3 cisgender men; right?

4 MR. FRAMPTON: Object to the form.

5 THE WITNESS: Yes, they are still biological 03:10:51
6 males.

7 BY MR. BLOCK:

8 Q And will have the same physiological
9 characteristics that are the basis for the performance
10 advantage; correct? 03:10:59

11 MR. FRAMPTON: Same objection.

12 THE WITNESS: That is correct. Male
13 physiology is the basis of the performance advantage.

14 BY MR. BLOCK:

15 Q So let's go back to that Hamilton article we 03:11:09
16 were discussing. So that is, I believe, Exhibit 79.

17 A All right.

18 Q Okay. Can you go to page 1402, please.

19 A All right. 1402.

20 Q Okay. Pull that up. 03:11:39

21 If you look on the right-hand column, on this
22 little table 1 --

23 A Yes.

24 Q -- do you see that?

25 And then you go -- one, two, three, four -- 03:11:54

1 five items down there, there's a line that begins with
2 "the assumption."

3 Do you see that?

4 A I do see that.

5 Q Okay. And that sentence says (as read): 03:12:04

6 "The assumption that the physiology of
7 elite DSD women and transwomen
8 athletes is the same as elite male
9 athletes is an oversimplified view."

10 Do you see that? 03:12:15

11 A I see that statement.

12 Q Okay. And you didn't cite to that statement
13 in your report; right?

14 A I disagree with that statement.

15 Q And, therefore, because you disagreed with it, 03:12:23
16 you chose not to cite it in your report?

17 MR. FRAMPTON: Object to the form.

18 THE WITNESS: I don't think it's appropriate
19 to cite a statement that I don't think I can defend.

20 BY MR. BLOCK: 03:12:36

21 Q Okay. Do you think it's appropriate to cite
22 an article who -- that contains many statements that --
23 that you don't think you can defend?

24 MR. FRAMPTON: Object to the form.

25 THE WITNESS: Yes. Trying to cite that there 03:12:53

1 is a lot of information out there.

2 BY MR. BLOCK:

3 Q I see.

4 If we go to page 1406 -- well, actually,
5 before going there, were you aware of this statement in 03:13:07
6 the Hamilton article at the time that you wrote your
7 report?

8 A Yes. I cited the Hamilton article. I had
9 read it.

10 Q All right. You -- okay. So you read the 03:13:22
11 whole thing, and then you picked out certain statements
12 to cite?

13 A Correct.

14 Q Okay. So if you go to page 1406.
15 Do you -- do you see your role in this case as 03:13:45
16 an advocate for one side or the other?

17 MR. FRAMPTON: Object to the form.

18 THE WITNESS: I have been retained to give my
19 expert opinion, my expert analysis of the data.

20 BY MR. BLOCK: 03:14:01

21 Q All right. And to -- but do -- do you see
22 your role in this case as presenting the portions of
23 the data that support one side?

24 MR. FRAMPTON: Object to the form.

25 THE WITNESS: I think my role is to present 03:14:19

1 the data and the information with which I agree with as
2 an expert.

3 BY MR. BLOCK:

4 Q Okay. So you -- you don't see your role in
5 this case as prevent- -- presenting an overview of the 03:14:32
6 data for and against H.B. 3293; right?

7 MR. TRYON: Objection.

8 MR. FRAMPTON: Object to form.

9 THE WITNESS: I think I'm suppo- -- my role is
10 presenting the information from the best of my 03:14:52
11 expertise and analysis of it, which -- what I think is
12 the correct information.

13 BY MR. BLOCK:

14 Q Okay. Not -- so -- so you don't think -- if
15 the Court wanted just an overview of the information 03:15:07
16 out there for and against H.B. 3293, your expert report
17 wouldn't be the source of getting that; right?

18 MR. FRAMPTON: Object to the form.

19 MR. TRYON: Objection.

20 THE WITNESS: I would think that would be a 03:15:27
21 specific request made by the Court to get information.

22 BY MR. BLOCK:

23 Q So -- but you saw -- but you said, when you
24 wrote your blog post, that, you know, the purpose of
25 that blog post was to provide information for educators 03:15:46

1 to use on their own, to teach the subject; right?

2 A That is correct.

3 Q Okay. And so you wrote that blog post with a
4 different purpose in mind than you wrote this document;
5 right? 03:16:03

6 A Yes. The blog post was intended for
7 educators.

8 Q And do you think that it's important for
9 educators to have accurate information?

10 MR. FRAMPTON: Object to the form. 03:16:20

11 THE WITNESS: Yes, educators need accurate
12 information.

13 BY MR. BLOCK:

14 Q Okay. So do -- do you think educators need
15 information different from what the court needs? 03:16:26

16 MR. FRAMPTON: Object to the form.

17 THE WITNESS: Truthful information is truthful
18 information, and I've done my best to present truthful
19 information.

20 BY MR. BLOCK: 03:16:40

21 Q Okay. So let's go to 1406 of -- of Hamilton.

22 MR. TRYON: Before you go on.

23 Mr. Frampton, I can't hear you when you're
24 objecting. If you could speak a little louder, please.

25 MR. FRAMPTON: Sure. 03:17:08

1 BY MR. BLOCK:

2 Q So in -- in 1406, in the paragraph beginning
3 with the words "despite the lack," do you see that?

4 A Page 1406?

5 Q Left -- left-hand column -- 03:17:23

6 A Okay. Yeah. That's three down?

7 Q Yes.

8 A Okay.

9 Q Okay. If you look at, I think, the third
10 sentence, after it says "Table 1," in parentheses, it 03:17:39
11 says (as read):

12 "Data showing lower baseline isometric
13 torque and muscle volume in transwomen
14 compared to cisgender males highlight
15 the problematic nature of inferring 03:17:50
16 that transwomen and cisgender males
17 are the same, as this ignores the
18 impact of gender-affirming treatments
19 such as HRT and GAS and the
20 psychological effects of gender 03:18:00
21 dysphoria such as low self-esteem,
22 anxiety and/or depression, and
23 becoming socially isolated."

24 Do you see that?

25 A I see that. 03:18:09

1 Q Okay. Do you disagree that there is data
2 showing lower baseline isometric torque and muscle
3 volume for trans women compared to cisgender women?

4 A So if I'm remembering correctly, reference 51
5 here is probably to the -- the article by Wiik and 03:18:26
6 Lundberg and others. That is the only paper I'm aware
7 of that evaluated isometric torque and muscle volume in
8 transgender individuals.

9 Can I refer to that paper to verify?

10 Q Yeah. If you look at 51, it -- it does go 03:18:40
11 back to the -- the Wiik article.

12 You're saying you want to look directly at the
13 Wiik article?

14 A I would like to.

15 Q All right. Well, we can try to make time for 03:18:51
16 that later.

17 So -- but sitting here, you're saying you're
18 not sure that that sentence accurately reports the --
19 the findings of the Wiik article?

20 A Yeah, I can't remember for -- right now what 03:19:08
21 the baseline data were in the Wiik article, whether
22 they were statistically significant or just numerically
23 different or what.

24 Q Okay.

25 A I can see the graph in my mind, but not in 03:19:22

1 enough detail to completely answer that.

2 Q Okay. Hold on one second. All right.

3 Let's go to the Harper article again. So that
4 is Exhibit 78.

5 A All right. 03:20:13

6 Q So if you go to page 7 of the Harper.

7 A All right.

8 Q All right. There's a paragraph that begins
9 with "of interest."

10 Do you see that? 03:20:42

11 A Right-hand side, first full paragraph, under
12 the table?

13 Q Yes.

14 A Okay.

15 Q All right. Where it says (as read): 03:20:48

16 "Of interest, compared with cisgender
17 men, hormone-naive transwomen
18 demonstrate 6.4%-8.0% lower lean body
19 mass, 6.0%-11.4% lower muscle CSA and
20 approximately 10%-14% lower handgrip
21 strength."

22 Do you see that?

23 A Yes.

24 Q And then it says (as read):

25 "This disparity is noteworthy given 03:21:14

1 that hormone-naive transwomen and
2 cisgender men have similar
3 testosterone levels."

4 Do you see that?

5 A Yes. 03:21:20

6 Q Okay. So do you have any reason to disagree
7 with those reported findings?

8 A I would like to include the next sentence,
9 where it says "explanations for this strength
10 difference are unclear," and continuing on with that, 03:21:37
11 indicating that the trans women may actively refrain
12 from building muscle and/or engaging in disordered
13 eating.

14 So there's a whole statement of speculative
15 explanations for that. 03:21:51

16 Q So do you -- do you have any explanations for
17 those differences?

18 A Well, we have no known biological markers in
19 which we can draw blood or a sample of something to say
20 that a person is transgender. And so it would 03:22:10
21 apparently be a social explanation for why the
22 transgender individuals have lower handgrip strength
23 and smaller muscles.

24 Q Okay. And so does that -- does that affect
25 whether or not having lower handgrip strength and 03:22:31

1 stronger (sic) muscles gives an advantage in athletic
2 performance?

3 MR. FRAMPTON: Object to the form.

4 Go ahead.

5 THE WITNESS: In those cited studies, the 03:22:43
6 handgrip strength of the trans women was in the 90 to
7 95th percentile for cisgender women.

8 So while they may be slightly less strong than
9 a typical male, they are considerably stronger than the
10 typical female. 03:22:57

11 Q Okay. Right. But my -- but my question is,
12 in terms of comparing the strength of trans women to
13 the strength of cis men, don't those studies show that,
14 with respect to those indicators of athletic
15 performance, the trans women are not the same as the 03:23:19
16 cis men?

17 MR. FRAMPTON: Object to the form.

18 THE WITNESS: So, Mr. Block, are you trying to
19 say that smaller, weaker men are trans women?

20 BY MR. BLOCK: 03:23:37

21 Q I'm -- I'm asking my question.

22 Can you answer my question, please?

23 A Could you please clarify the question?

24 Q Yes.

25 Don't those -- doesn't that data show that -- 03:23:47

1 to use the words of Harper -- hormone-naive trans women
2 may not, on average, have the same athletic attributes
3 as cisgender men?

4 MR. FRAMPTON: Object to the form.

5 Go ahead. 03:24:05

6 THE WITNESS: I think there are a whole lot of
7 qualifying statements that need to be included in that.

8 BY MR. BLOCK:

9 Q Okay. And so putting aside the cause of these
10 differences, putting aside whether those causes are, 03:24:22

11 you know, physiological or as a result of social
12 factors, all right, at the end of the day, regardless

13 of the cause, doesn't this data reflect that on a

14 population level, hormone-naive trans women may not, on

15 average, have the same athletic attributes as cisgender 03:24:46

16 men?

17 MR. FRAMPTON: Same objection.

18 Go ahead.

19 THE WITNESS: Those studies were not

20 attempting to evaluate baseline population-wide 03:24:57

21 strength for trans women, and so I don't think that we

22 can accurately extrapolate them to the population of

23 trans women.

24 BY MR. BLOCK:

25 Q Okay. If the participa- -- in the 03:25:08

1 participants on -- in those studies had performed
2 physical fitness tests alongside cisgender men, would
3 it be reasonable to assume that the participants in
4 these studies would not have performed as well on those
5 physical fitness tests? 03:25:26

6 MR. FRAMPTON: Object to form.

7 THE WITNESS: So if we are stating these
8 participants, yes, these participants were not as
9 strong as their comparison group.

10 But I do again want to caveat that neither of 03:25:40
11 these groups really were designed to represent
12 population-wide strength or body mass distributions.

13 BY MR. BLOCK:

14 Q Now, you've discussed in your article -- or
15 your article -- you've discussed in your report, you 03:25:57
16 know, your view that once you have acquired muscle
17 mass, that lowering your circulating testosterone does
18 not sufficiently reduce that muscle mass to eliminate a
19 performance advantage; is that right?

20 A I think you've appropriately characterized 03:26:20
21 what I've stated.

22 Q Thank you.

23 And so in your article, do -- or in your
24 report, do you discuss at all whether if someone lowers
25 their circulating testosterone before acquiring a lot 03:26:37

1 of muscle mass or doing exercises or training, whether
2 having a lower level of testosterone would restrict
3 their ability to add new muscle mass?

4 MR. FRAMPTON: Object to the form.

5 THE WITNESS: I don't think I addressed that 03:27:04
6 topic specifically, as far as how much reducing
7 testosterone and then engaging in training can
8 compensate for reduced testosterone.

9 BY MR. BLOCK:

10 Q Okay. So let's say the -- the trans women in 03:27:16
11 this study and the cis men in the study both engage in
12 the same types of exercise regimens, but the trans
13 women, given their lower baselines and -- have these
14 lower baselines and have lowered their testosterone
15 before engaging in these exercise regimens, is it -- do 03:27:49
16 you have an expert opinion on whether you would expect
17 that these trans women, having lowered their
18 testosterone levels, would be able to acquire new
19 muscle mass at the same degree as the cis men who had
20 not lowered their testosterone levels? 03:28:05

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: Based on research not cited in
23 my article, because I didn't think it was worth going
24 into in that particular publication -- or that expert
25 declaration, there is information that in middle-aged 03:28:20

1 men who suppress their testosterone and such as a
2 treatment for prostate health problems, they're able to
3 engage in strength training to overcome the lost
4 testosterone. And so that is the closest to a
5 speculative statement we can make regarding of how 03:28:43
6 transgender women, or trans women, would respond to
7 training.

8 BY MR. BLOCK:

9 Q Okay. If we go back to the Hamilton article
10 for a second. I apologize. If you go to 1407 of the 03:29:05
11 Hamilton article.

12 Let me know when you're there, okay?

13 A All right. 1407. I'm there.

14 Q Uh-huh. It says -- halfway through the -- the
15 first paragraph there, there's a sentence that begins 03:30:11
16 "in contrast."

17 Do you see that?

18 A Page 1407. Are we on the left-hand side?

19 Q I'm sorry, on the right-hand side.

20 A Ah, okay. I wondered. 03:30:26

21 There we go. Right-hand side, just after
22 citation to 61, it says, "In contrast."

23 Q Right. It says (as read):

24 "In contrast, when bioavailable
25 testosterone was reduced to castrate 03:30:34

1 levels in young men, isometric
2 strength did not increase after
3 resistance exercise training."

4 Are you familiar with that study that --
5 that's being referred to? 03:30:48

6 A I am not familiar with that study.

7 Q Okay. If you look at footnote 62 of the
8 article, it says it's a study by Kvorning,
9 K-V-O-R-N-I-N-G, from 2006.

10 Just sitting here today, does -- are you 03:31:09
11 familiar with the Kvorning study from 2006?

12 A That -- that study is not ringing a bell.

13 Q Okay.

14 Okay. The -- the name of the study is
15 "Suppression of endogenous testosterone production 03:31:27
16 attenuates the response to strength training: a
17 randomized, placebo-controlled, and blinded
18 intervention study."

19 Still doesn't ring a bell?

20 A Still not ringing a bell. 03:31:40

21 Q Okay. So if -- if -- from the title of that
22 study, does the study seem to be in tension with the
23 study you just cited to me about how people, the
24 cisgender men, who are on therapies that lower their
25 tosterone -- testosterone being able to have strength 03:32:01

1 training to overcome the deficit?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: Looking at that study and the
4 study I was referring to, it appears that the two are
5 somewhat contradictory, but it's also hard to say with 03:32:21
6 this saying young men and the older -- the other one
7 was dealing with older men.

8 Without looking at both studies side by side,
9 it's really hard to make a comparison.

10 BY MR. BLOCK: 03:32:32

11 Q Okay. So in the -- in the Hamilton article,
12 after the sentence I read, it says (as read):

13 "Assuming these findings are
14 replicated and if extrapolated to
15 elite DSD women athletes and 03:32:46
16 transwomen athletes, they would imply
17 that decreasing bioavailable
18 testosterone concentrations would
19 mitigate to some extent any previous
20 sporting advantage due to the 03:32:57
21 previously high testosterone
22 concentrations."

23 Do you agree with that sentence?

24 MR. FRAMPTON: Object to the form.

25 THE WITNESS: Would mitigate to some extent, 03:33:12

1 yes.

2 BY MR. BLOCK:

3 Q Okay.

4 MR. BLOCK: Can we take a break and go off the

5 record? 03:33:19

6 THE VIDEOGRAPHER: We are off -- off the

7 record at 3:33 p.m.

8 (Recess.)

9 THE VIDEOGRAPHER: We are on the record at

10 3:43 p.m. 03:43:29

11 BY MR. BLOCK:

12 Q Hi, Dr. Brown. I -- I won't keep you too much

13 longer, but -- but I do have some -- I'm going to keep

14 you a little bit longer, though.

15 If -- 03:43:39

16 A No worries.

17 Q If we could go to the Hilton article again,

18 which is marked as Exhibit -- I can't see it on my

19 computer. One sec. The Hilton article is Exhibit 76.

20 A All right. 03:44:05

21 Q All right. Thanks.

22 If you look at page 208, under 4.3.

23 A Yes.

24 Q All right. Just the second sentence there, it

25 says (as read): 03:44:35

1 "Sex differences in endurance
2 performance are generally smaller than
3 for events relying more on muscle mass
4 and explosive strength."

5 Do you see that? 03:44:43

6 A Yes, I see that.

7 Q Okay. Do you -- do you agree with that
8 statement?

9 A Typically, the differences between males and
10 females for endurance running events or swimming events 03:44:52
11 are somewhere in the range of 10 to 13 percent compared
12 to the 25 percent or more in strength sports.

13 Q So -- so that means you agree with that
14 statement?

15 A Yes. 03:45:08

16 Q Okay. Thanks.

17 All right. If you look at, again, 208, it
18 says -- the paragraph before 4.3.

19 A That big long one?

20 Q Yep. 03:45:49

21 And near -- like two-thirds down, there's a
22 sentence that begins with "furthermore."

23 Do you see that?

24 A Okay. Furthermore, given the (sic) cohorts?

25 Q Yeah. So I -- I just want to direct your 03:46:01

1 attention to the first half of the sentence. This is
2 the Hilton article. And it says (as read):

3 "Furthermore, given that cohorts of
4 transgender women often have slightly
5 lower baseline measurements of muscle 03:46:15
6 and strength than control males."

7 Do you see that?

8 A Yes.

9 Q Okay. And then if you follow that footnote,
10 it goes to footnote 53, and there's an article by 03:46:25
11 someone whose name I can't pronounce. It's Van
12 C-A-E-N-E-G-E-M.

13 Are you able to click through to footnote 53?

14 A Can we agree to call that Van C?

15 Q Oh, good -- good call. Yes. 03:46:46

16 A Yeah, I don't know how to say the last name
17 either.

18 Q Okay. All right.

19 And so could you -- you see the footnote?

20 A Yes. 03:46:52

21 Q Okay. And the footnote is to an article that
22 says, "Preservation of volumetric bone density and
23 geometry in trans women during cross-sex hormonal
24 therapy: a prospective observational study"; right?

25 A Yes. 03:47:06

1 Q Okay. And so Hilton cites this article for
2 the proposition that -- I have to get -- I don't want
3 to misquote her. Hold on -- it says -- cites for the
4 proposition that cohorts of transgender women often
5 have slightly lower baseline measurements of muscle and 03:47:36
6 strength than control males; right?

7 A Yes, that is what it says.

8 Q Okay. And so that's a sim- -- that's similar
9 to the statement in the Hamilton article; right?

10 MR. FRAMPTON: Object to the form. 03:47:47

11 THE WITNESS: I'm sorry, can we go back to
12 what the Hamilton article says, or could you --

13 BY MR. BLOCK:

14 Q Sorry, I'm -- I just want to -- you know, we
15 looked at two sources that talk about how the baseline 03:47:54
16 measurements of trans women are not always the same as
17 the baseline measurements of control cis men. And we
18 looked at two studies saying that, one was the Hamilton
19 study and one was the Harper study. And all I want to
20 do is add this study as -- this article as a third 03:48:13
21 article making that observation.

22 Would you agree that this article is another
23 article that at least makes the observation that the
24 baseline measurements for trans women appear to often
25 be lower than the baseline measurements for cisgender 03:48:36

1 men who are used as controls?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: I -- I think in this article by
4 Hilton, a couple of key points here is where it says
5 "cohorts of transgender women," not saying population 03:48:53
6 representative sampling or anything like that. And
7 then there's a lot of further qualifications that you
8 go on in that sentence emphasizing caution with
9 interpreting these data.

10 BY MR. BLOCK: 03:49:10

11 Q Yeah. Well, so, actually, I have a question
12 for you.

13 So you talk about how these are just cohorts
14 of trans women, not population samples, but you cite to
15 these same articles in support of your argument that -- 03:49:20
16 about the effects of gender-affirming hormones, don't
17 you?

18 A Yes, I cite these articles.

19 Q Okay. So how come -- can't the same caveat be
20 made that whatever conclusions you're drawing about 03:49:39
21 trans women from these articles don't necessarily apply
22 to trans women at a population level?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: These are the best sources of
25 information that we have, and the studies looking at 03:49:54

1 changes over time or changes in strength, muscle mass
2 and such that I've cited, that was the purpose of the
3 study, was to evaluate those changes and then
4 statistically apply it to a population whereas those
5 studies were not designed to get a population baseline 03:50:13
6 sampling for normative data.

7 BY MR. BLOCK:

8 Q Okay. Well, that -- I'm glad you made that
9 point because -- let's go to -- to your expert report
10 where -- on page -- on page -- let me make sure I have 03:50:28
11 the right page.

12 So page 2 -- actually, go to page 1, so I'm
13 not missing anything.

14 Let me know when you're at page 1.

15 A So is page 1 Personal Qualifications and 03:51:02
16 Disclosure?

17 Q It is.

18 A Okay.

19 Q So right before the bullet points, you say (as
20 read): 03:51:08

21 "Articles that I have published that
22 are closely related to topics that I
23 discuss in this white paper
24 include..."

25 And then there's a list. Right? 03:51:14

Page 270

1 A Yes.

2 Q And -- and then if you go to the -- the second
3 to last bullet point.

4 A Yes.

5 Q Do you see that? 03:51:26

6 That says (as read):

7 "A study finding (among other things)

8 that height, body mass, and maximal

9 oxygen consumption were higher in a

10 group of male NCAA Division 2 distance 03:51:36

11 runners, while women NCAA Division 2

12 distance runners had higher percent

13 body fat."

14 Do you see that?

15 A Yes. 03:51:48

16 Q Okay. And we discussed this study during our
17 previous deposition. Do you remember that?

18 A Yeah. It's a fun paper.

19 Q Yeah. But we discussed how this data about

20 height, body mass and oxygen consumption was base- -- 03:52:00

21 was data -- baseline data that you took of -- of these

22 athletes, but the purpose of the study was not to do a

23 population-wide, you know, sampling of -- of height,

24 body mass and oxygen consumption; right?

25 A Yes, that is correct. 03:52:22

1 Q Okay. So -- so what you just said before,
2 when we were talking about the -- the cohorts of trans
3 women, you had said, well, the purpose of those studies
4 was not to provide population sampling on, you know,
5 the physiological characteristics of -- of the trans 03:52:43
6 women in the study; therefore, you couldn't extrapolate
7 that as a general matter, all trans women were likely
8 to have similar characteristics.

9 Is that -- is that a fair summary of what you
10 had just said? 03:52:59

11 MR. FRAMPTON: Object to the form.

12 THE WITNESS: Yes, that is a fair summary.

13 BY MR. BLOCK:

14 Q But in your description of your study here, do
15 you think a reader, reading that sentence, would think 03:53:10
16 that you are making the statement that as a general
17 matter, on a population-wide basis, you found in your
18 study that height, body mass and mox -- maximal oxygen
19 consumption were higher for the male NCAA competitors
20 compared to female NCAA competitors? 03:53:32

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: I'm kind of unclear with what
23 you're trying to ask.

24 BY MR. BLOCK:

25 Q Yeah, so I'm saying that this happened to be 03:53:45

1 the data for a particular cohort that you're doing a
2 different study on; correct?

3 MR. FRAMPTON: Object to the form.

4 THE WITNESS: So, yes, as I've stated, this is
5 a group of male and female Division II distance 03:53:57
6 runners.

7 BY MR. BLOCK:

8 Q Okay. And so that study wouldn't allow you to
9 draw any conclusions generalizable to other males and
10 females about, you know, what their comparative height, 03:54:10
11 body mass and oxygen consumption would be; right?

12 MR. FRAMPTON: Same objection.

13 THE WITNESS: I don't think I've ever
14 purported that that was the purpose of this study.

15 BY MR. BLOCK: 03:54:24

16 Q You don't think that someone reading that
17 sentence, where it says the study -- a study finding
18 these things, you don't think someone reading that
19 sentence would have the impression that that was the
20 purpose of the study? 03:54:40

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: Those were findings of the
23 study. That's what I have states, is those are
24 findings of the study.

25 ///

1 BY MR. BLOCK:

2 Q Was the rest of the -- is the rest of the
3 study relevant to the topic of this case?

4 A You mean is that the male athletes were faster
5 than the female athletes? 03:55:10

6 Q I mean -- what -- what I mean is you -- you --
7 you select this finding from the study, but were any
8 other findings from that study relevant to this case?

9 A Yes, we could say that. For the same heart
10 rate, the men were faster than the women. 03:55:32

11 Q Okay. Okay. Let's go to -- to page 4.

12 A On my declaration?

13 Q Yeah. Or your report.

14 A Yeah, just make sure we're on the same -- so
15 this is the overview? 03:55:54

16 Q Yes. And I just want to direct your attention
17 to the three bullet points that you've listed there.

18 Do you see them?

19 A Yes, I do.

20 Q Okay. Are you offering any expert opinions in 03:56:11
21 this case other than the opinions contained in those
22 three bullet points?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: Well, I -- I mean, those are the
25 basis for everything else, those three bullet points, 03:56:35

1 and most of the other information is trying to support
2 and substantiate why I drew those conclusions.

3 BY MR. BLOCK:

4 Q Okay. So -- but there are no -- I appreciate
5 that. 03:56:48

6 There's -- you're not offering an opinions on
7 any other issue, are you?

8 MR. FRAMPTON: Object to the form.

9 THE WITNESS: Kind of unclear what you're
10 asking. 03:57:07

11 I think it states there fairly clearly what
12 I'm -- the -- the statements I'm trying to make.

13 BY MR. BLOCK:

14 Q Yeah, I'm just trying to nail down the full
15 scope of the expert opinions you're offering here. And 03:57:24
16 so you're not offering any expert opinions on the
17 appropriateness of particular modes of healthcare for
18 trans people; is that right?

19 A That is correct, I'm not offering an opinion
20 on healthcare for transgender individuals. 03:57:45

21 Q Okay. And you are not -- you discuss these
22 bullet points, what you say are advantages, but you are
23 not offering an opinions on whether particular policies
24 are fair or unfair in light of the data that you
25 present here, are you? 03:58:08

1 MR. FRAMPTON: Object to the form and scope.

2 Go ahead.

3 THE WITNESS: So I think this comes back to

4 our previous discussion where we discuss the

5 irreconcilable differences between inclusion and 03:58:21

6 fairness.

7 BY MR. BLOCK:

8 Q Yes, it does, which is why I'm coming back to

9 it.

10 So I -- I -- you know, I understand that, you 03:58:37

11 know, you have laid out your criteria, your -- excuse

12 me -- your credentials for proving -- for providing an

13 expert opinion on whether an advantage exists, and so

14 I -- I -- I just want to find out whether or not, you

15 know, the -- in light of that information you present 03:58:58

16 regarding the existence or nonexistence of an

17 advantage, whether a particular policy maker will then

18 decide that something is fair or unfair, is not -- is

19 not something that you are providing an expert opinion

20 on; right? 03:59:18

21 MR. FRAMPTON: Same objection.

22 Go ahead.

23 THE WITNESS: So I'm trying to detail the

24 advantages, the differences between males and females

25 biologically, documenting the advantages in athletic 03:59:30

1 performance the males have over female, documenting
2 what we know regarding transgender individuals and
3 their -- the treatments that they might receive and how
4 that would affect athletic advantages, and then
5 bringing up the point that there is, apparently, some 03:59:47
6 irreconcilable differences -- I'm not sure if that's
7 the best way to state it, but I state it in the
8 document -- between goals of inclusion and fairness.

9 BY MR. BLOCK:

10 Q Yeah, I guess -- someone reading your 04:00:00
11 report -- you know, let's say someone reads all the
12 information in the report, absorbs all the facts, you
13 know, and then, you know, is asked, based on all the
14 facts presented in your report, is it fair to include
15 trans girls and women or not to include them, would you 04:00:21
16 have any greater expertise in answering that ultimate
17 question than anyone else who has absorbed the facts
18 you presented in your report?

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: Are you saying does every piece 04:00:46
21 of knowledge I've ever written put on -- on this
22 document and someone would know everything that I know?

23 BY MR. BLOCK:

24 Q No. I'm saying that based on these facts, you
25 know, someone needs to draw a conclusion about what's 04:01:02

1 fair, okay? And so my question is -- you know, I
2 understand that you're providing an expert -- you know,
3 opinions on the -- the -- the -- the facts you say in
4 your report. All my question is that, you know, the
5 second step of drawing a conclusion about what's fair 04:01:18
6 or unfair is not something that you are an expert on;
7 right?

8 MR. FRAMPTON: Object to the form.

9 Go ahead.

10 THE WITNESS: I would hope that someone would 04:01:33
11 read my document, and they're also going to read the
12 document from the other experts, weigh the evidence and
13 make a decision on what is -- what is fair.

14 BY MR. BLOCK:

15 Q And -- and you are not offering, you know, 04:01:52
16 that decision, that ultimate decision, as part of your
17 expert report; right? That's for someone else to
18 decide?

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: Yes, that is my intention, is 04:02:16
21 that someone else will weigh the information, weigh the
22 data and make their decision.

23 MR. BLOCK: All right. Thank you, Dr. Brown.

24 I have no further questions.

25 MR. FRAMPTON: Anyone else? 04:02:37

1 MS. GREEN: This is Roberta Green on behalf of
2 WVSSAC. No questions.

3 THE VIDEOGRAPHER: Can we go off the record,
4 Attorney Block?

5 MR. BLOCK: Sure. Unless anyone else wants to 04:02:52
6 say on the record that they don't have any other
7 questions.

8 MR. CROPP: This is Jeffrey Cropp with
9 Harrison County Board of Education and Dora Stutler. I
10 have no question. 04:02:57

11 MR TAYLOR: Michael Taylor on behalf of the
12 State BOE and Superintendent Burch. No questions.

13 MR. TRYON: Dave Tryon. No questions.

14 MR. FRAMPTON: Hal Frampton for the
15 intervenor. No questions.

16 It sounds like we're done.

17 MR. BLOCK: See you in another two years,
18 Dr. Brown.

19 (Simultaneous speaking.)

20 MS. DUPHILY: Hold on. Let's take this off 04:03:24
21 the record. One second.

22 THE VIDEOGRAPHER: We are off the record at
23 4:03 p.m., and this concludes today's testimony given
24 by Gregory Brown.

25 The total number of media used was eight and 04:03:31

1 will be retained by Veritext Legal Solutions.

2 (TIME NOTED: 4:03 p.m.)

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I, GREGORY BROWN, Ph.D., do hereby declare under penalty of perjury that I have read the foregoing transcript; that I have made any corrections as appear noted, in ink, initialed by me, or attached hereto; that my testimony as contained herein, as corrected, is true and correct.

EXECUTED this ____ day of _____,
20____, at _____, _____.
(City) (State)

GREGORY BROWN, Ph.D.

Volume I

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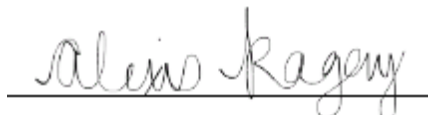
I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: April 5, 2022



ALEXIS KAGAY

CSR NO. 13795

Exhibit 31

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

B.P.J., by her next friend and mother, HEATHER JACKSON,

Plaintiff,

vs.

WEST VIRGINIA STATE BOARD OF EDUCATION; HARRISON COUNTY BOARD OF EDUCATION; WEST VIRGINIA SECONDARY SCHOOLS ACTIVITIES COMMISSION; W. CLAYTON BURCH, in his official capacity as State Superintendent, DORA STUTLER, in her official capacity as the Harrison County Superintendent, and the STATE OF WEST VIRGINIA,

Defendants,

and

LAINY ARMISTEAD,

Defendant-Intervenor.

Case No. 2:21-cv-00316

Hon. Joseph R. Goodwin

DECLARATION OF DR. CHAD T. CARLSON, M.D., FACSM

I, Dr. Chad T. Carlson, pursuant to 28 U.S. Code § 1746, declare under penalty of perjury under the laws of the United States of America that the facts contained in my Expert Report of Dr. Chad T. Carlson, M.D., FACM prepared for *B.P.J. v. West Virginia*, attached hereto, are true and correct to the best of my knowledge and belief, and that the opinions expressed therein represent my own expert opinions.

Executed on February 23, 2022.



Chad T. Carlson, MD

**Expert Report of Dr. Chad Thomas Carlson, M.D., FACM
prepared for *B.P.J. v. West Virginia*
February 23, 2022**

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INTRODUCTION

Up to the present, the great majority of news, debate, and even scholarship about transgender participation in female athletics has focused on track and field events and athletes, and the debate has largely concerned questions of fairness and inclusion. However, the transgender eligibility policies of many high school athletic associations in the United States apply with equal force to all sports, including sports in which players frequently collide with each other, or can be forcefully struck by balls or equipment such as hockey or lacrosse sticks. And in fact, biologically male transgender athletes have competed in a wide range of high school, collegiate, and professional girls' or women's sports, including, at least, basketball,¹ soccer,² volleyball,³ softball,⁴ lacrosse,⁵ and even women's tackle football.⁶

¹https://www.espn.com/espnw/athletes-life/story/_/id/10170842/espnw-gabrielle-ludwig-52-year-old-transgender-women-college-basketball-player-enjoying-best-year-life (accessed 2/17/22)

²https://www.unionleader.com/news/education/nh-bill-limits-women-s-sports-to-girls-born-female/article_d1998ea1-a1b9-5ba4-a48d-51a2aa01b910.html;
<https://www.outsports.com/2020/1/17/21069390/womens-soccer-mara-gomez-transgender-player-argentina-primera-division-villa-san-marcos> (accessed 6/20/21)

³<https://news.ucsc.edu/2016/09/challenging-assumptions.html> (accessed 6/20/21);
<https://www.outsports.com/2017/3/20/14987924/trans-athlete-volleyball-tia-thompson> (accessed 6/20/21)

⁴<https://www.foxnews.com/us/californias-transgender-law-allows-male-high-schooler-to-make-girls-softball-team> (accessed 6/20/21)

⁵<https://savewomenssports.com/f/emilys-story?blogcategory=Our+Stories> (accessed 6/20/21)

⁶<https://www.outsports.com/2017/12/13/16748322/britney-stinson-trans-football-baseball> (accessed 6/20/21); <https://www.mprnews.org/story/2018/12/22/transgender-football-player-prevails-in-lawsuit> (accessed 6/20/21)

The science of sex-specific differences in physiology, intersecting with the physics of sports injury, leaves little doubt that participation by biological males in these types of girls' or women's sports, based on gender identity, creates significant additional risk of injury for the biologically female participants competing alongside these transgender athletes.

In 2020, after an extensive review of the scientific literature, consultation with experts, and modeling of expected injuries, World Rugby published revised rules governing transgender participation, along with a detailed explanation of how the new policy was supported by current evidence. World Rugby concluded that “there is currently no basis with which safety and fairness can be assured to biologically female rugby players should they encounter contact situations with players whose biological male advantages persist to a large degree,” and that after puberty, “the lowering of testosterone removes only a small proportion of the documented biological differences.” Hence, World Rugby concluded that biological men should not compete in women's rugby. (World Rugby Transgender Women Guidelines 2020.) World Rugby has been criticized by some for its new guidelines, but those criticisms have often avoided discussions of medical science entirely, or have asserted that modeling scenarios can overstate true risk. What cannot be denied, however, is that World Rugby's approach is evidence-based, and rooted in concern for athlete safety. As a medical doctor who has spent my career in sports medicine, it is my opinion that World Rugby's assessment of the evidence is scientifically sound, and that injury modeling

meaningfully predicts that biologically male transgender athletes do constitute a safety risk for the biologically female athlete in women's sports.

In a similar vein, in 2021, the UK Sports Councils' Equality Group released new guidance for transgender inclusion in organized sports. This guidance was formulated after extensive conversations with stakeholders, a review of scientific findings related to transgender athletes in sport through early 2021, and an assessment of the use by some sport national governing bodies of case-by-case assessment to determine eligibility. Noteworthy within these stakeholder consultations was a lack of consensus on any workable solution, as well as concerns related to athlete safety and "adherence to rules which give sport validity." The Literature Review accompanying the guidance document further noted that "[t]here are significant differences between the sexes which render direct competition between males and females . . . unsafe in sports which allow physical contact and collisions." (UK Sports Councils' Equality Group Literature Review 2021 at 1.) Their review of the science "made clear that there are retained differences in strength, stamina and physique between the average woman compared with the average transgender woman....with or without testosterone suppression." (UK Sports Councils' Equality Group Guidance at 3.) This was also reflected in their ten guiding principles, stating that physical differences between the sexes will "impact safety parameters in sports which are combat, collision or contact in nature." (UK Sports Councils' Equality Group Guidance 2021 at 7.) Ultimately, UK Sport

concluded that the full inclusion of transgender athletes in women’s sports “cannot be reconciled within the current structure of sport,” stating that “the inclusion of transgender people into female sport cannot be balanced regarding transgender inclusion, fairness and safety in gender-affected sport where there is meaningful competition due to retained differences in strength, stamina and physique between the average woman compared with the average transgender woman..., with or without testosterone suppression.” (UK Sports Councils’ Equality Group Guidance 2021 at 6.) Finally, UK Sport affirmed the use of sex categorization in sport, along with age and disability, as important for the maintenance of safety and fairness. (UK Sports Councils’ Equality Group Guidance 2021 at 7-8.)

Unfortunately, apart from World Rugby’s careful review and the recent release of UK Sports Councils’ guidance, the public discourse is lacking any careful consideration of the question of safety. As a physician who has spent my career caring for athletes, I find this silence about safety both surprising and concerning. It is my hope through this white paper to equip and motivate sports leagues and policy makers to give adequate attention to the issue of safety for female athletes when transgender policies are being considered. I first explain the nature and causes of common sports injuries. I then review physiological differences between male and female bodies that affect the risk and severity of injuries to females when biological males compete in the female category, and

explain why testosterone suppression does not eliminate these heightened risks to females. Finally, I explain certain conclusions about those risks.

CREDENTIALS

1. I am a medical doctor practicing Sports Medicine, maintaining an active clinical practice at Stadia Sports Medicine in West Des Moines, Iowa. I received my M.D. from the University of Nebraska College of Medicine in 1994 and completed a residency in family medicine at the University of Michigan in 1997.

2. Following my time in Ann Arbor, I matched to a fellowship in Sports Medicine at Ball Memorial Hospital in Muncie, Indiana, training from 1997 to 1999, with clinical time split between Central Indiana Orthopedics, the Ball State Human Performance Laboratory, and the Ball State University training room. I received my board certification in Sports Medicine in 1999, which I continue to hold. Since residency training, my practice has focused on Sports Medicine—the treatment and prevention of injuries related to sport and physical activity.

3. Since 1997, I have served in several clinical practices and settings as a treating physician, including time as team physician for both the University of Illinois and Ball State University, where I provided care to athletes in several sports, including football, ice hockey, basketball, field hockey, softball, gymnastics, soccer, and volleyball. In the course of my career, I have provided coverage for NCAA Power Five Conference championships and NCAA National

Championship events in basketball, field hockey and gymnastics, among other sports, as well as provided coverage for national championship events for U.S.A. gymnastics, and U.S. Swimming and Diving. I have also covered professional soccer in Des Moines.

4. Since 2006, I have been the physician owner of Stadia Sports Medicine in West Des Moines, Iowa. My practice focuses on treatment of sports and activity-related injury, including concussive injury, as well as problems related to the physiology of sport.

5. I have served in and provided leadership for several professional organizations over the course of my career. In 2004, I was designated a Fellow of the American College of Sports Medicine (ACSM). I have served on ACSM's Health and Science Policy Committee since 2010, and for a time chaired their Clinical Medicine Subcommittee. From 2009 to 2013, I served two elected terms on the Board of Directors of the American Medical Society for Sports Medicine (AMSSM), and during that time served as Chair of that body's Practice and Policy Committee. I was subsequently elected to a four-year term on AMSSM's executive committee in 2017, and from 2019-20, I served as AMSSM's President. AMSSM is the largest organization of sports medicine physicians in the world. I gained fellowship status through AMSSM in 2020—my first year of eligibility. My work for ACSM and AMSSM has brought with it extensive experience in public policy as relates to Sports Medicine.

6. In 2020, I was named as AMSSM's first board delegate to the newly-constituted Physical Activity Alliance. I am a named member of an NCAA advisory group on COVID-19, through which I provided input regarding the cancellation of the basketball tournament in 2020. I also serve as a member of the Iowa Medical Society's Sports Medicine Subcommittee and have been asked to serve on the Iowa High School Athletic Association's newly-forming Sports Medicine Advisory Committee.

7. I have served as a manuscript reviewer for organizational policy pronouncements, and for several professional publications, most recently a sports medicine board review book just published in 2021. I have published several articles on topics related to musculoskeletal injuries in sports and rehabilitation, which have been published in peer-reviewed journals such as Clinical Journal of Sports Medicine, British Journal of Sports Medicine, Current Reviews in Musculoskeletal Medicine, Athletic Therapy Today, and the Journal of Athletic Training. In conjunction with my work in policy advocacy, I have helped write several pieces of legislation, including the initial draft of what became the Sports Medicine Licensure Clarity Act, signed into law by President Trump in 2018, which eases the restrictions on certain practitioners to provide health services to athletes and athletic teams outside of the practitioner's home state. A list of my publications over the past ten (10) years is included as an appendix to this report.

8. In the past four years, I have not testified as an expert witness in a deposition or at trial.

9. I am being compensated for my services as an expert witness in this case at the rates of \$650 per hour for consultation, \$800 per hour for deposition testimony, and \$3,500 per half-day of trial testimony.

I. OVERVIEW

10. In this statement, I offer information and my own professional opinion on the potential for increased injury risk to females in sports when they compete against biologically male transgender athletes.⁷ At many points in this statement, I provide citations to published, peer-reviewed articles that provide relevant and supporting information to the points I make.

11. The principal conclusions that I set out in this white paper are as follows:

- a. Government and sporting organizations have historically considered the preservation of athlete safety as one component of competitive equity.
- b. Injury in sport is somewhat predictable based on modeling assumptions that take into account relevant internal and external risk factors.

⁷ In the body of this paper, I use the terms “male” and “female” according to their ordinary medical meaning—that is to say, to refer to the two biological sexes. I also use the word “man” to refer to a biologically male human, and “woman” to refer to a biologically female human. In the context of this opinion, I include in these categories non-syndromic, biologically-normal males and females who identify as a member of the opposite sex, including those who use endogenous hormone suppression to alter their body habitus. In contexts that are not focused on questions of biology and physiology, terms of gender are sometimes used to refer to subjective identities rather than to biological categories – something I avoid for purposes of a paper focused on sports science

c. Males exhibit large average advantages in size, weight, and physical capacity over females—often falling far outside female ranges. Even before puberty, males have a performance advantage over females in most athletic events. Failure to preserve protected female-only categories in contact sports (broadly defined) will ultimately increase both the frequency and severity of injury suffered by female athletes who share playing space with these males.

d. Current research supports the conclusion that suppression of testosterone levels by males who have already begun puberty will not fully reverse the effects of testosterone on skeletal size, strength, or muscle hypertrophy, leading to persistence of sex-based differences in power, speed, and force-generating capacity.

12. In this white paper, I use the term “contact sports” to refer broadly to all sports in which collisions between players, or collisions between equipment such as a stick or ball and the body of a player, occur with some frequency (whether or not permitted by the rules of the game), and are well recognized in the field of sports medicine as causes of sport-related injuries.⁸ The 1975 Title IX implementing regulations (34 CFR § 106.41) say that “for purposes of this [regulation] contact sports include boxing, wrestling, rugby, ice hockey, football, basketball, *and other sports* the purpose or major activity of which involves bodily contact.” Certainly, all of the sports specifically named in the regulation fall within my definition of “contact sport.” Mixed martial arts, field hockey (Barboza 2018), soccer (Kuczinski 2018), rugby (Viviers 2018), lacrosse

⁸ It is common to see, within the medical literature, reference to distinctions between “contact” and “collision” sports. For purposes of clarity, I have combined these terms, since in the context of injury risk modeling, there is no practical distinction between them.

(Pierpoint 2019), volleyball,⁹ baseball, and softball also involve collisions that can and do result in injuries, and so also fall within my definition.

II. A BRIEF HISTORY OF THE RATIONALE FOR SEPARATION OF SPORT BY SEX

13. World Rugby is correct when it notes that “the women’s category exists to ensure protection, safety, and equality” for women. (World Rugby Transgender Women Guidelines 2020.) To some extent, those in charge of sport governing bodies in the modern era have always recognized the importance of grouping athletes together based on physical attributes, in order to ensure both safety and competitive balance. Weight classifications have existed in wrestling since it reappeared as an Olympic event in 1904. Women and men have participated in separate categories since the advent of intercollegiate sporting clubs early in the 20th century. When Title IX went into effect in 1975, there were just under 300,000 female high school athletes, and fewer than 10,000 female collegiate athletes. With the changes that resulted from Title IX, it was assumed that newly-available funds for women in sport would ensure the maintenance of existing, or creation of new, sex-segregated athletic teams that would foster greater participation by women. This has been borne out subsequently; by the first half of the 1980’s these numbers had risen to 1.9 million and nearly 100,000 respectively. (Hult 1989.)

⁹ See <https://www.latimes.com/sports/story/2020-12-08/stanford-volleyball-hayley-hodson-concussions-cte-lawsuit>, and <https://volleyballmag.com/corinneatchison/> (both accessed 6/20/21).

14. The rationale for ongoing “separate but equal” status when it came to sex-segregated sports was made clear within the language of the original implementing regulations of Title IX , which, acknowledging real, biologically-driven differences between the sexes, created carve-out exceptions authorizing sex-separation of sport for reasons rooted in the maintenance of competitive equity. Importantly, the effect of these innate sex-based differences on the health and safety of the athlete were acknowledged by the express authorization of sex-separated teams for sports with higher perceived injury risk—i.e., “contact sports.” (Coleman 2020.)

15. In the almost half century since those regulations were adopted, the persistent reality of sex-determined differences in athletic performance and safety has been recognized by the ongoing and nearly universal segregation of men’s and women’s teams—even those that are not classically defined as being part of a contact or collision sport.

16. Now, however, many schools and sports leagues in this country are permitting males to compete in female athletics—including in contact sports—based on gender identity. In my view, these policies have been adopted without careful analysis of safety implications. Other researchers and clinicians have addressed questions of the negative impact of such policies on fairness, or equality of athletic experiences for girls and women, in published articles, and in court submissions. One recent review of track and field performances, including sprints, distance races and field events, noted that men surpass the

top female performance in each category between 1000 and 10,000 times *each year*, with hundreds or thousands of men beating the top women in each event. (Coleman & Shreve.) Although this was not their primary focus, World Rugby well-summarized the point when it observed that in a ranking list of the top thousand performances in most sports, every year, *every one* will have been achieved by a biological male. (World Rugby Transgender Women Guidelines 2020.) Although most easily documented in athletes who have gone through puberty, these differences are not exclusively limited to post-pubescent athletes either.

17. I have reviewed the expert declaration of Gregory A. Brown, Ph.D., FACM of February 23, 2022, provided in this case, which includes evidence from a wide variety of sources, including population-based mass testing data, as well as age-stratified competition results, all of which support the idea that prepubertal males run faster, jump higher and farther, exhibit higher aerobic power output, and have greater upper body strength (evidenced by stronger hand grip and better performance with chin-ups or bent arm hang) than comparably aged females. This performance gap is well-documented in population-based physiologic testing data that exists in databases such as the Presidential Fitness Test, the Eurofit Fitness test, and additional mass testing data from the UK and Australia. Collectively, this data reveals that pre-pubertal males outperform comparably aged females in a wide array of athletic tests including but not limited to the countermovement jump test, drop jump test, change of direction

test, long jump, timed sit-up test, the 10 X 5 meter shuttle run test, the 20 meter shuttle run test, curl-ups, pull-ups, push-ups, one mile run, standing broad jump, and bent arm hang test. Dr. Brown further references studies showing a significant difference in the body composition of males and females before puberty. In sum, a large and unbridgeable performance gap between the sexes is well-studied and equally well-documented, beginning in many cases before puberty. In this white paper, I focus on some of these differences as they touch on the question of athlete safety.

III. UNDERSTANDING THE CAUSES OF SPORTS INJURIES

18. The causes for injury in sport are multifactorial. In recent decades, medical researchers have provided us an evolving understanding of how sports injuries occur, as well as the factors that make them more or less probable, and more or less severe. Broadly speaking, there are two ways of modeling injury: the epidemiological model, and the biomechanical model. These models are not mutually exclusive, but provide complementary conceptual frameworks to help us stratify risk in sport.

A. The epidemiological model of injury

19. From a practical standpoint, sports medicine researchers and clinicians often use the “epidemiological model” to explain, prevent and manage sports injuries. Broadly speaking, this model views an injury in sport as the product of internal and external risk factors, triggered by an inciting event. In other words, a given injury is “caused” by a number of different factors that are

unique to a given situation. (Meeuwise 1994.) When the interplay of these factors exceeds the injury threshold, injury occurs. One example of how this interplay might work would be a female distance runner in track who develops a tibial stress fracture, with identified risks of low estrogen state from amenorrhea (suppression of menses), an aggressive winter training program on an indoor tile surface, and shoes that have been used for too many miles, and are no longer providing proper shock absorption. Most risk factors ebb and flow, with the overall injury risk at any given time fluctuating as well. Proper attention to risk factor reduction *before* the start of the sports season (including appropriate rule-making) is the best way to reduce actual injury rates *during* the season.

20. As alluded to, the risk factors associated with injury can be broadly categorized as internal or external. Internal risk factors are internal to the athlete. These include relatively fixed variables, such as the athlete's age, biological sex, bone mineral density (which affects bone strength) and joint laxity, as well as more mutable variables such as body weight, fitness level, hydration state, current illness, prior injury, or psychosocial factors such as aggression.

21. External risk factors are, as the name suggests, external to the athlete. These include non-human risks such as the condition of the playing surface or equipment, athletic shoe wear, or environmental conditions. Other external risk factors come from opposing competitors, and include such

variables as player size, speed, aggressiveness, and overall adherence to the rules of the game. As already mentioned, these risks can be minimized through the proper creation and enforcement of rules, as well as the appropriate grouping of athletes together for purposes of competition. To the latter point, children don't play contact sports with adults and, in the great majority of cases, men and women compete in categories specific to their own biological sex. Certainly these categorical separations are motivated in part by average performance differences and considerations of fairness and opportunity. But they are also motivated by safety concerns. When properly applied, these divisions enhance safety because, when it comes to physical traits such as body size, weight, speed, muscle girth, and bone strength, although a certain amount of variability exists within each group, the averages and medians differ widely *between* the separated groups.¹⁰

22. Thus, each of these commonly utilized groupings of athletes represents a pool of individuals with predictable commonalities. Epidemiological risk assessment is somewhat predictable and translatable as long as these pools remain intact. But the introduction of outside individuals

¹⁰ In some cases, safety requires even further division or exclusion. A welterweight boxer would not compete against a heavyweight, nor a heavyweight wrestle against a smaller athlete. In the case of youth sports, when children are at an age where growth rates can vary widely, leagues will accommodate for naturally-occurring large discrepancies in body size by limiting larger athletes from playing positions where their size and strength is likely to result in injury to smaller players. Thus, in youth football, players exceeding a certain weight threshold may be temporarily restricted to playing on the line and disallowed from carrying the ball, or playing in the defensive secondary, where they could impose high-velocity hits on smaller players.

into a given pool (e.g. an adult onto a youth football team, or males into most women's sports) would change the balance of risk inside that pool. Simply put, when you introduce larger, faster, and stronger athletes from one pool into a second pool of athletes who are *categorically* smaller (whether as a result of age or sex), you have altered the characteristics of the second pool, and, based on known injury modeling, have statistically increased the injury risk for the original athletes in that pool. This, in a nutshell, is the basis for World Rugby's recommendations.

23. Most clinical studies of the epidemiology of sports injuries use a multivariate approach, identifying multiple independent risk factors and examining how these factors might interact, in order to determine their relative contribution to injury risk, and make educated inferences about causation. (Meeuwise 1994.)

24. In applying the multivariate approach, the goal is to keep as many variables as possible the same so as to isolate the potential effect of a single variable (such as age or biological sex) on injury risk, as well as to determine how the isolated variable interacts with the other analyzed variables to affect injury risk. Failure to consider relevant independent variables can lead to error. Researchers focusing on differences between male and female athletes, for example, would not compare concussion rates of a high school girls' soccer team to concussion rates of a professional men's soccer team, because differences in the concussion rate might be due to a number of factors besides sex, such as age,

body mass, relative differences in skill, speed, or power, as well as differences in training volume and intensity.

25. As indicated earlier, an injury event is usually the end product of a number of different risk factors coming together. (Bahr 2005.) A collision between two soccer players who both attempt to head the ball, for example, might be the inciting event that causes a concussion. Although the linear and angular forces that occur through sudden deceleration would be the proximate cause of this injury, the epidemiological model of injury would also factor in “upstream” risks, predicting the possibility of an injury outcome for each athlete differently depending on the sum of these risks. If the collision injury described above occurs between two disparately-sized players, the smaller athlete will tend to decelerate more abruptly than the larger athlete, increasing the smaller athlete’s risk for injury. Additional discrepancies in factors such as neck strength, running speeds, and muscle force generation capacity all result in differing risks and thus, the potential for differing injury outcomes from the same collision. As I discuss later in this white paper, there are significant statistical differences between the sexes when it comes to each of these variables, meaning that in a collision sport where skeletally mature males and females are playing against one another, there is a higher statistical likelihood that injury will result when collisions occur, and in particular there is a higher likelihood that a female will suffer injury. This again is the basis for the recent decision by World Rugby to disallow the crossover of men into women’s rugby,

regardless of gender identity. (World Rugby Transgender Women Guidelines 2020.) The decision-making represented by this policy change is rational and rooted in objective facts and objective risks of harm, because it takes real, acknowledged, and documented physical differences between the sexes (in many cases before adolescence), and models expected injury risk on the basis of the known differences that persist even after hormone manipulation.

B. The biomechanical model of injury

26. Sports medicine researchers and clinicians also consider a biomechanical approach when it comes to understanding sports injuries. In the biomechanical model of injury, injury is considered to be analogous to the failure of a machine or other structure. Every bone, muscle, or connective tissue structure in an athlete's body has a certain load tolerance. Conceptually, when an external "load" exceeds the load tolerance of a given structure in the human body, an injury occurs. (Fung 1993 at 1.) Thus, researchers focus on the mechanical load—the force exerted on a bone, ligament, joint or other body part—and the load tolerance of that impacted or stressed body part, to understand what the typical threshold for injury is, and how predictable this might be. (McIntosh 2005 at 2-3.) Biomechanical models of injury usually consider forces in isolation. The more consistent the movement pattern of an individual, and the fewer the contributions of unexpected outside forces to the athlete, the more accurate biomechanical predictions of injury will be.

27. Biomechanical modeling can be highly predictive in relatively simple settings. For example, in blunt trauma injury from falls, mortality predictably rises the greater the fall. About 50% of people who fall four stories will survive, while only 10% will survive a fall of seven stories. (Buckman 1991.) As complexity increases, predictability in turn decreases. In sport, the pitching motion is highly reproducible, and strain injury to the ulnar collateral ligament (UCL) of the elbow can be modeled. The load tolerance of the UCL of a pitcher's elbow is about 32 Newton-meters, but the failure threshold of a ligament like this in isolation is not the only determinant of whether injury will occur. During the pitching motion, the valgus force imparted to the elbow (gapping stress across the inner elbow that stretches the UCL) routinely reaches 64 Newtons, which is obviously greater than the failure threshold of the ligament. Since not all pitchers tear their UCLs, other variables innate to an athlete must mitigate force transmission to the ligament and reduce risk. The load tolerance of any particular part of an athlete's body is thus determined by other internal factors such as joint stiffness, total ligament support, muscle strength across the joint, or bone mineral density. Injury load can be self-generated, as in the case of a pitcher's elbow, or externally-generated, as in the case of a linebacker hitting a wide receiver. While load tolerance will vary by individual, as described above, and is often reliant on characteristics innate to a given athlete, external load is determined by outside factors such as the nature of the playing surface or

equipment used, in combination with the weight and speed of other players or objects (such as a batted ball) with which the player collides. (Bahr 2005.)

28. As this suggests, the two “models” of sports injuries described above are not in any sense inconsistent or in tension with each other. Instead, they are complementary ways of thinking about injuries that can provide different insights. But the important point to make regarding these models is that in either model, injury risk (or the threshold for injury) rises and falls depending on the size of an externally-applied force, and the ability of a given athlete to absorb or mitigate that force.

IV. THE PHYSICS OF SPORTS INJURY

29. Sports injuries often result from collisions between players, or between a player and a rapidly moving object (e.g. a ball or hockey puck, a lacrosse or hockey stick). In soccer, for example, most head injuries result from collisions with another player’s head or body, collision with the goal or ground, or from an unanticipated blow from a kicked ball. (Boden 1998; Mooney 2020.) In basketball, players often collide with each other during screens, while diving for a loose ball, or while driving to the basket. In lacrosse or field hockey, player-to-player, or player-to-stick contact is common.

30. But what are the results of those collisions on the human body? Basic principles of physics can cast light on this question from more than one angle. A general understanding of these principles can help us identify factors

that will predictably increase the relative risk, frequency, and severity of sports injuries, given certain assumptions.

31. First, we can consider **energy**. Every collision involves an object or objects that possess energy. The energy embodied in a moving object (whether a human body, a ball, or anything else) is called kinetic energy.

32. Importantly, the kinetic energy of a moving object is expressed as: $E_k = \frac{1}{2}mv^2$. That is, kinetic energy is a function of the mass of the object multiplied by the *square* of its velocity. (Dashnaw 2012.) To illustrate with a simple but extreme example: if athletes A and B are moving at the same speed, but athlete A is twice as heavy, athlete A carries twice as much kinetic energy as athlete B. If the two athletes weigh the same amount, but athlete A is going twice as fast, athlete A carries four times as much kinetic energy as athlete B. But as I have noted, the kinetic energy of a moving object is a function of the mass of the object multiplied by the square of its velocity. Thus, if athlete A is twice as heavy, and moving twice as fast, athlete A will carry eight times the kinetic energy of athlete B into a collision.¹¹

33. The implication of this equation means that what appear to be relatively minor discrepancies in size and speed can result in major differences in energy imparted in a collision, to the point that more frequent and more severe injuries can occur. To use figures that correspond more closely to average

¹¹ $2 \times 2^2 = 8$

differences between men and women, if Player M weighs only 20% more than Player F, and runs only 15% faster, Player M will bring *58% more kinetic energy* into a collision than Player F.¹²

34. The law of conservation of energy tells us that energy is never destroyed or “used up.” If kinetic energy is “lost” by one body in a collision, it is inevitably transferred to another body, or into a different form. In the case of collision between players, or between (e.g.) a ball and a player’s head, some of the energy “lost” by one player, or by the ball, may be transformed into (harmless) sound; some may result in an increase in the kinetic energy of the player who is struck (through acceleration, which I discuss below); but some of it may result in *deformation* of the player’s body—which, depending on its severity, may result in injury. Thus, the greater the kinetic energy brought into a collision, the greater the potential for injury, all other things being equal.

35. Alternately, we can consider force and *acceleration*, which is particularly relevant to concussion injuries.

36. Newton’s third law of motion tells us that when two players collide, their bodies experience equal and opposite forces at the point of impact.

37. Acceleration refers to the rate of change in speed (or velocity). When two athletes collide, their bodies necessarily accelerate (or decelerate) rapidly: stopping abruptly, bouncing back, or being deflected in a different

¹² $1.2 \times (1.15)^2 = 1.587$

direction. Newton's second law of motion tells us that: $F = ma$ (that is, force equals mass multiplied by acceleration). From this equation we see that when a larger and a smaller body collide, and (necessarily) experience equal and opposite forces, the smaller body (or smaller player, in sport) will experience more rapid acceleration. We observe this physical principle in action when we watch a bowling ball strike bowling pins: the heavy bowling ball only slightly changes its course and speed; the lighter pins go flying.

38. This same equation also tells us that if a given player's body or head is hit with a *larger* force (e.g., from a ball that has been thrown or hit faster), it will experience *greater* acceleration, everything else being equal.

39. Of course, sport is by definition somewhat chaotic, and forces are often not purely linear. Many collisions also involve angular velocities, with the production of rotational force, or torque. Torque can be thought of as force that causes rotation around a central point. A different but similar equation of Newtonian physics governs the principles involved.¹³ Torque is relevant to injury in several ways. When torque is applied through joints in directions those joints are not able to accommodate, injury can occur. In addition, rotational force can cause different parts of the body to accelerate at different rates—in some cases, very rapid rates, also leading to injury. For example, a collision where the

¹³ In this equation, $\tau = I\alpha$, torque equals moment of inertia multiplied by angular acceleration, where "moment of inertia" is defined as $I = mr^2$, that is, mass multiplied by the square of the distance to the rotational axis.

body is impacted at the waist can result in high torque and acceleration on the neck and head.

40. Sport-related concussion—a common sports injury and one with potentially significant effects—is attributable to linear, angular, or rotational acceleration and deceleration forces that result from impact to the head, or from an impact to the body that results in a whiplash “snap” of the head. (Rowson 2016.) In the case of a concussive head injury, it is the brain that accelerates or decelerates on impact, colliding with the inner surface of the skull. (Barth 2001 at 255.)

41. None of this is mysterious: each of us, if we had to choose between being hit either by a large, heavy athlete running at full speed, or by a small, lighter athlete, would intuitively choose collision with the small, light athlete as the lesser of the two evils. And we would be right. One author referred to the “increase in kinetic energy, and therefore imparted forces” resulting from collision with larger, faster players as “profound.” (Dashnaw 2012.)

V. GENDER DIFFERENCES RELEVANT TO INJURY

42. It is important to state up front that it is self-evident to most people familiar with sport and sport injuries that if men and women were to consistently participate together in competitive contact sports, there would be higher rates of injury in women. This is one reason that rule modifications often

exist in leagues where co-ed participation occurs.¹⁴ Understanding the physics of sports injuries helps provide a theoretical framework for why this is true, but so does common sense and experience. All of us are familiar with basic objective physiological differences between the sexes, some of which exist in childhood, and some of which become apparent after the onset of puberty, and persist throughout adulthood. And as a result of personal experience, all of us also have some intuitive sense of what types of collisions are likely to cause pain or injury. Not surprisingly, our “common sense” on these basic facts about the human condition is also consistent with the observations of medical science. Below, I provide quantifications of some of these well-known differences between the sexes that are relevant to injury risk, as well as some categorical differences that may be less well known.

A. Height and weight

43. It is an inescapable fact of the human species that males as a group are statistically larger and heavier than females. On average, men are 7% to 8% taller than women. (Handelsman 2018 at 818.) According to the most recently available Centers for Disease Control and Prevention (CDC) statistics, the weight of the average U.S. adult male is 16% greater than that of the average U.S. adult female. (CDC 2018.) This disparity persists into the athletic cohort.

¹⁴ For example, see <https://www.athleticbusiness.com/college/intramural-coed-basketball-playing-rules-vary-greatly.html> (detailing variety of rule modifications applied in co-ed basketball). Similarly, coed soccer leagues often prohibit so-called “slide tackles,” which are not prohibited in either men’s or women’s soccer. See, e.g., <http://www.premiercoedsports.com/pages/rulesandpolicies/soccer>.

Researchers find that while athletes tend on average to be lighter than non-athletes, the weight difference between the average adult male and female athlete remains within the same range—between 14% and 23%, depending on the sport analyzed. (Santos 2014; Fields 2018.) Indeed, World Rugby estimates that the typical male rugby player weighs 20% to 40% more than the typical female rugby player. (World Rugby Transgender Women Guidelines 2020.) This size advantage by itself allows men to bring more force to bear in a collision.

B. Bone and connective tissue strength

44. Men have bones in their arms, legs, feet, and hands that are both larger and stronger per unit volume than those of women, due to greater cross-sectional area, greater bone mineral content, and greater bone density. The advantage in bone size (cross-sectional area) holds true in both upper and lower extremities, even when adjusted for lean body mass. (Handelsman 2018 at 818; Nieves 2005 at 530.) Greater bone size in men is also correlated with stronger tendons that are more adaptable to training (Magnusson 2007), and an increased ability to withstand the forces produced by larger muscles (Morris 2020 at 5). Male bones are not merely larger, they are stronger per unit of volume. Studies of differences in arm and leg bone mineral density – one component of bone strength – find that male bones are denser, with measured advantages of between 5% and 14%. (Gilsanz 2011; Nieves 2005.)

45. Men also have larger ligaments than women (Lin 2019 at 5), and stiffer connective tissue (Hilton 2021 at Table 1), providing greater protection against joint injury.

C. Speed

46. When it comes to acceleration from a static position to a sprint, men are consistently faster than women. World record sprint performance gaps between the sexes remain significant at between 7% and 10.5%, with world record times in women now exhibiting a plateau (no longer rapidly improving with time) similar to the historical trends seen in men. (Cheuvront 2005.) This performance gap has to do with, among other factors, increased skeletal stiffness, greater cross-sectional muscle area, denser muscle fiber composition and greater limb length. (Handelsman 2018.) Collectively, males, on average, run about 10% faster than females. (Lombardo 2018 at 93.) This becomes important as it pertains to injury risk, because males involved in sport will often be travelling at faster speeds than their female counterparts in comparable settings, with resultant faster speed at impact, and thus greater impact force, in a given collision.

D. Strength/Power

47. In 2014, a male mixed-martial art fighter identifying as female and fighting under the name Fallon Fox fought a woman named Tamikka Brents, and caused significant facial injuries in the course of their bout. Speaking about their fight later, Brents said:

“I’ve fought a lot of women and have never felt the strength that I felt in a fight as I did that night. I can’t answer whether it’s because she was born a man or not because I’m not a doctor. I can only say, I’ve never felt so overpowered ever in my life, and I am an abnormally strong female in my own right.”¹⁵

48. So far as I am aware, mixed martial arts is not a collegiate or high school interscholastic sport. Nevertheless, what Brent experienced in an extreme setting is true and relevant to safety in all sports that involve contact. In absolute terms, males as a group are substantially stronger than women.

49. Compared to women, men have “larger and denser muscle mass, and stiffer connective tissue, with associated capacity to exert greater muscular force more rapidly and efficiently.” (Hilton 2021 at 201.) Research shows that on average, during the prime athletic years (ages 18-29) men have, on average, 54% greater total muscle mass than women (33.7 kg vs. 21.8 kg) including 64% greater muscle mass in the upper body, and 47% greater in the lower body. (Janssen 2000 at Table 1.) The cross-sectional area of muscle in women is only 50% to 60% that of men in the upper arm, and 65% to 70% of that of men in the thigh. This translates to women having only 50% to 60% of men's upper limb strength and 60% to 80% of men's lower limb strength. (Handelsman 2018 at 812.) Male weightlifters have been shown to be approximately 30% stronger than female weightlifters of equivalent stature and mass. (Hilton 2021 at 203.) But in competitive athletics, since the stature and mass of the average male

¹⁵ <https://bjj-world.com/transgender-mma-fighter-fallon-fox-breaks-skull-of-her-female-opponent/>

exceeds that of the average female, actual differences in strength between average body types will, on average, exceed this. The longer limb lengths of males augment strength as well. Statistically, in comparison with women, men also have lower total body fat, differently distributed, and greater lean muscle mass, which increases their power-to-weight ratios and upper-to-lower limb strength ratios as a group. Looking at another common metric of strength, males average 57% greater grip strength (Bohannon 2019) and 54% greater knee extension torque (Neder 1999). Research shows that sex-based discrepancies in lean muscle mass begin to be established from infancy, and persist through childhood to adolescence. (Davis 2019; Kirchengast 2001; Taylor 1997; Taylor 2010; McManus 2011.)

50. Using their legs and torso for power generation, men can apply substantially larger forces with their arms and upper body, enabling them to generate more ball velocity through overhead motions, as well as to generate more pushing or punching power. In other words, isolated sex-specific differences in muscle strength in one region (even differences that in isolation seem small) can, and do combine to generate even greater sex-specific differences in more complex sport-specific functions. One study looking at moderately-trained individuals found that males can generate 162% more punching power than females. (Morris 2020.) Thus, multiple small advantages aggregate into larger ones.

E. Throwing and kicking speed

51. One result of the combined effects of these sex-determined differences in skeletal structure is that men are, on average, able to throw objects faster than women. (Lombardo 2018; Chu 2009; Thomas 1985.) By age seventeen, the *average* male can throw a ball farther than 99% of seventeen-year-old females—which necessarily means at a faster initial speed assuming a similar angle of release— despite the fact that factors such as arm length, muscle mass, and joint stiffness individually don't come close to exhibiting this degree of sex-defined advantage. One study of elite male and female baseball pitchers showed that men throw baseballs 35% faster than women—81 miles/hour for men vs. 60 miles/hour for women. The authors of this study attribute this to a sex-specific difference in the ability to generate muscle torque and power. (Chu 2009.) A study showing greater throwing velocity in male versus female handball players attributed it to differences in body size, including height, muscle mass, and arm length. (Van Den Tillaar 2012.) Interestingly, significant sex-related difference in throwing ability has been shown to manifest even before puberty, but the difference increases rapidly during and after puberty. (Thomas 1985 at 266.) These sex-determined differences in throwing speed are not limited to sports where a ball is thrown. Males have repeatedly been shown to throw a javelin more than 30% farther than females. (Lombardo 2018 Table 2; Hilton 2021 at 203.) Even in preadolescent children, differences exist. International youth records for 5- to

12-year-olds in the javelin show 34-55% greater distance in males vs. females using a 400g javelin.¹⁶

52. Men also serve and spike volleyballs with higher velocity than women, with a performance advantage in the range of 29-34%. (Hilton 2021.) Analysis of first and second tier Belgian national elite male volleyball players shows ball spike speeds of 63 mph and 56 mph respectively. (Forthomme 2005.) NCAA Division I female volleyball players—roughly comparable to the second-tier male elite group referenced above—average a ball spike velocity of approximately 40 mph (18.1 m/s). (Ferris 1995 at Table 2.) Notably, based on the measurements of these studies, male spiking speed in *lower* elite divisions is almost 40% greater than that of NCAA Division I female collegiate players. Separate analyses of serving speed between elite men and women Spanish volleyball players showed that the average power serving speed in men was 54.6 mph (range 45.3–64.6 mph), with maximal speed of 76.4 mph. In women, average power serving speed was 49 mph (range 41–55.3 mph) with maximal speed of 59 mph. This translates to an almost 30% advantage in maximal serve velocity in men. (Palao 2014.)

53. Recall that kinetic energy is dependent on mass and the square of velocity. A volleyball (with fixed mass) struck by a male, and traveling an

¹⁶ <http://age-records.125mb.com/>.

average 35% faster than one struck by a female, will deliver 82% more energy to a head upon impact.

54. The greater leg strength and jumping ability of men confer a further large advantage in volleyball that is relevant to injury risk. In volleyball, an “attack jump” is a jump to position a player to spike the ball downward over the net against the opposing team. Research on elite national volleyball players found that on average, males exhibited a 50% greater vertical jump height during an “attack” than did females. (Sattler 2015.) Similar data looking at countermovement jumps (to block a shot) in national basketball players reveals a 35% male advantage in jump height. (Kellis 1999.) In volleyball, this dramatic difference in jump height means that male players who are competing in female divisions will more often be able to successfully perform a spike, and this will be all the more true considering that the women’s net height is seven inches lower than that used in men’s volleyball. Confirming this inference, research also shows that the successful attack percentage (that is, the frequency with which the ball is successfully hit over the net into the opponent’s court in an attempt to score) is so much higher with men than women that someone analyzing game statistics can consistently identify games played by men as opposed to women on the basis of this statistic alone. These enhanced and more consistently successful attacks by men directly correlate to their greater jumping ability and attack velocity at the net. (Kountouris 2015.)

55. The combination of the innate male-female differences cited above, along with the lower net height in women's volleyball, means that if a reasonably athletic male is permitted to compete against women, the participating female players will likely be exposed to higher ball velocities that are outside the range of what is typically seen in women's volleyball. When we recall that ball-to-head impact is a common cause of concussion among women volleyball players, this fact makes it clear that participation in girls' or women's volleyball by biologically male individuals will increase concussion injury risk for participating girls or women.

56. Male sex-based advantages in leg strength also lead to greater kick velocity. In comparison with women, men kick balls harder and faster. A study comparing kicking velocity between university-level male and female soccer players found that males kick the ball with an average 20% greater velocity than females. (Sakamoto 2014.) Applying the same principles of physics we have just used above, we see that a soccer ball kicked by a male, travelling an average 20% faster than a ball kicked by a female, will deliver 44% more energy on head impact. Greater force-generating capacity will thus increase the risk of an impact injury such as concussion.

VI. ENHANCED FEMALE VULNERABILITY TO CERTAIN INJURIES

57. Above, I have reviewed physiological differences that result in the male body bringing greater weight, speed, and force to the athletic field or court,

and how these differences can result in a greater risk of injury to females when males compete against them. It is also true that the female body is more vulnerable than the male body to certain types of injury even when subject to comparable forces. This risk appears to extend to the younger age cohorts as well. An analysis of Finnish student athletes from 1987-1991, analyzing over 600,000 person-years of activity exposures, found, in students under fifteen years of age, higher rates of injury in girls than boys in soccer, volleyball, judo and karate. (Kujala 1995.) Another epidemiological study looking specifically at injury rates in over 14,000 middle schoolers over a 20 year period showed that “in sex-matched sports, middle school girls were more likely to sustain *any* injury (RR = 1.15, 95% CI = 1.1, 1.2) or a time-loss injury (RR = 1.09, 95% CI = 1.0, 1.2) than middle school boys.” In analyzed both-sex sports (i.e., sex-separated sports that both girls and boys play, like soccer), girls sustained higher injury rates, and greater rates of time-loss injury. (Beachy 2014.) Another study of over 2000 middle school students at nine schools showed that the injury rate was higher for girls’ basketball than for football (39.4 v 30.7/1000 AEs), and injury rates for girls’ soccer were nearly double that of boys’ soccer (26.3 v. 14.7/1000 AEs). (Caswell 2017.) In this regard, I will focus on two areas of heightened female vulnerability to collision-related injury which have been extensively studied: concussions, and anterior cruciate ligament injuries.

A. Concussions

58. Females are more likely than males to suffer concussions in comparable sports, and on average suffer more severe and longer lasting disability once a concussion does occur. (Harmon 2013 at 4; Berz 2015; Blumenfeld 2016; Covassin 2003; Rowson 2016.) Females also seem to be at higher risk for post-concussion syndrome than males. (Berz 2015; Blumenfeld 2016; Broshek 2005; Colvin 2009; Covassin 2012; Dick 2009; Marar 2012; Preiss-Farzanegan 2009.)

59. The most widely-accepted definition of sport-related concussion comes from the Consensus Statement on Concussion in Sport (see below).¹⁷ (McCrorry 2018.) To summarize, concussion is “a traumatically induced transient

¹⁷ “Sport related concussion is a traumatic brain injury induced by biomechanical forces. Several common features that may be utilised in clinically defining the nature of a concussive head injury include:

SRC may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head.

SRC typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, signs and symptoms evolve over a number of minutes to hours.

SRC may result in neuropathological changes, but the acute clinical signs and symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.

SRC results in a range of clinical signs and symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive features typically follows a sequential course. However, in some cases symptoms may be prolonged.

The clinical signs and symptoms cannot be explained by drug, alcohol, or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction, etc) or other comorbidities (e.g., psychological factors or coexisting medical conditions).”

disturbance of brain function and involves a complex pathophysiological process” that can manifest in a variety of ways. (Harmon 2013 at 1.)

60. Sport-related concussions have undergone a significant increase in societal awareness and concurrent injury reporting since the initial passage of the Zachery Lystedt Concussion Law in Washington State in 2009 (Bompadre 2014), and the subsequent passage of similar legislation governing return-to-play criteria for concussed athletes in most other states in the United States. (Nat’l Cnf. of State Leg’s 2018). Concussion is now widely recognized as a common sport-related injury, occurring in both male and female athletes. (CDC 2007.) Sport-related concussions can result from player-surface contact or player-equipment contact in virtually any sport. However, sudden impact via a player-to-player collision, with rapid deceleration and the transmission of linear or rotational forces through the brain, is also a common cause of concussion injury. (Covassin 2012; Marar 2012; Barth 2001; Blumenfeld 2016; Boden 1998; Harmon 2013 at 4.)

61. A large retrospective study of U.S. high school athletes showed a higher rate of female concussions in soccer (79% higher), volleyball (0.6 concussions/10,000 exposures, with 485,000 reported exposures, vs. no concussions in the male cohort), basketball (31% higher), and softball/baseball (320% higher). (Marar 2012.) A similarly-sized, similarly-designed study comparing concussion rates between NCAA male and female collegiate athletes showed, overall, a concussion rate among females 40% higher than that of

males. Higher rates of injury were seen across individual sports as well, including ice hockey (10% higher); soccer (54% higher); basketball (40% higher); and softball/baseball (95% higher). (Covassin 2016.) The observations of these authors, my own observations from clinical practice, and the acknowledgment of our own Society's Position Statement (Harmon 2013), all validate the higher frequency and severity of sport-related concussions in women and girls.

62. Most epidemiological studies to date looking at sport-related concussion in middle schoolers show that more boys than girls are concussed. There are fewer studies estimating concussion *rate*. This is, in part, because measuring injury rate is more time and labor-intensive. Researchers at a childrens' hospital, for example, could analyze the number of children presenting to the emergency department with sport-related concussion and publish findings of absolute number. However, to study concussion incidence, athlete exposures also have to be recorded. Generally speaking, an athlete exposure is a single practice or game where an athlete is exposed to playing conditions that could reasonably supply the necessary conditions for an injury to occur. Rates of athletic injury, concussion among them, are then, by convention, expressed in terms of injury rate per 1000 athletic exposures. More recently, some studies have been published that analyze the rates of concussion in the middle school population. Looking at the evidence, the conclusion can be made that females experience increased susceptibility to concussive injuries before puberty. For example, Ewing-Cobbs, et al. (2018) found elevated post-

concussion symptoms in girls across all age ranges studied, including children between the ages of 4 and 8. Kerr's 2017 study of middle school students showed over three times the rate of female vs male concussion in students participating in sex-comparable sports [0.18 v. 0.66/1000 A.E.'s]. (Kerr 2017.) This is the first study I am aware of that mimics the trends seen in adolescent injury epidemiology showing a higher rate of concussion in girls than boys in comparable sports.

63. More recent research looking at the incidence of sport-related concussions in U.S. middle schoolers between 2015 and 2020, found that the rate of concussion was higher in middle school athletes than those in high school. In this study, girls had more than twice the rate of concussion injury (0.49/1000 athletic exposures vs 0.23/1000 AE) in analyzed sports (baseball/softball, basketball, soccer and track), as well as statistically greater time loss. (Hacherl 2021 (Journal of Athletic Training); Hacherl 2021 (Archives of Clinical Neuropsychology).) The authors hypothesized that the increasing incidence of concussion in middle school may relate to "other distinct differences associated with the middle school sport setting itself, such as, the large variations in player size and skill."¹⁸

64. In addition, females on average suffer materially greater cognitive impairment than males when they do suffer a concussion. Group differences in

¹⁸ <https://www.nata.org/press-release/062421/middle-school-sports-have-overall-higher-rate-concussion-reported-high-school>.

cognitive impairment between females and males who have suffered concussion have been extensively studied. A study of 2340 high school and collegiate athletes who suffered concussions determined that females had a 170% higher frequency of cognitive impairment following concussions, and that in comparison with males, female athletes had significantly greater declines in simple and complex reaction times relative to their preseason baseline levels. Moreover, the females experienced greater objective and subjective adverse effects from concussion even after adjusting for potentially protective effect of helmets used by some groups of male athletes. (Broshek 2005 at 856, 861; Colvin 2009; Covassin 2012.)

65. This large discrepancy in frequency and severity of concussion injury is consistent with my own observations across many years of clinical practice. The large majority of student athletes who have presented at my practice with severe and long-lasting cognitive disturbance have been adolescent girls. I have seen girls remain symptomatic for over a year, and lose ground academically and become isolated from their peer groups due to these ongoing symptoms. For patients who experience these severe effects, post-concussion syndrome can be life-altering.

66. Some of the anatomical and physiological differences that we have considered between males and females help to explain the documented differences in concussion rates and in symptoms between males and females. (Covassin 2016; La Fontaine 2019; Lin 2019; Tierney 2005; Wunderle 2014.)

Anatomically, there are significant sex-based differences in head and neck anatomy, with females exhibiting in the range of 30% to 40% less head-neck segment mass and neck girth, and 49% lower neck isometric strength. This means that when a female athlete's head is subjected to the same load as an analogous male, there will be a greater tendency for head acceleration, and resultant injury. (Tierney 2005 at 276-277.)

67. When modeling the effect of the introduction of male mass, speed, and strength into women's rugby, World Rugby gave particular attention to the resulting increases in forces and acceleration (and injury risk) experienced in the head and neck of female players. Their analysis found that "the magnitude of the known risk factors for head injury are . . . predicted by the size of the disparity in mass between players. The addition of [male] speed as a biomechanical variable further increases these disparities," and their model showed an increase of up to 50% in neck and head acceleration that would be experienced in a typical tackle scenario in women's rugby. As a result, "a number of tackles that currently lie beneath the threshold for injury would now exceed it, causing head injury." (World Rugby Transgender Women Guidelines 2020.) While rugby is notoriously contact-intensive, similar increases to risk of head and neck injury to women are predictable in any sport context in which males and females collide at significant speed, as happens from time to time in sports including soccer, softball, and basketball.

68. In addition, even when the heads of female and male athletes are subjected to identical accelerative forces, there are sex-based differences in neural anatomy and physiology, cerebrovascular organization, and cellular response to concussive stimuli that make the female more likely to suffer concussive injury, or more severe concussive injury. For instance, hypothalamic-pituitary disruption is thought to play a role in post-concussion symptomatology that differentially impacts women. (McGroarty 2020; Broshek 2005 at 861.) Another study found that elevated progesterone levels during one portion of the menstrual cycle were associated with more severe post-concussion symptomatology that differentially impacted women. (Wunderle 2014.)

69. As it stands, when females compete against each other, they already have higher rates of concussive injury than males, across most sports. The addition of biologically male athletes into women's contact sports will inevitably increase the risk of concussive injury to girls and women, for the multiple reasons I have explained above, including, but not limited to, the innate male advantage in speed and lean muscle mass. Because the effects of concussion can be severe and long-lasting, particularly for biological females, we can predict with some confidence that if participation by biological males in women's contact sports based on gender identity becomes more common, more biological females will suffer substantial concussive injury and the potential for long-term harm as a result.

B. Anterior Cruciate Ligament injuries

70. The Anterior Cruciate Ligament (“ACL”) is a key knee stabilizer that prevents anterior translation of the tibia relative to the femur and also provides rotatory and valgus knee stability.¹⁹ (Lin 2019 at 4.) Girls and women are far more vulnerable to ACL injuries than are boys and men. The physics of injury that we have reviewed above makes it inevitable that the introduction of biologically male athletes into the female category will increase still further the occurrence of ACL injuries among girls or women who encounter these players on the field.

71. Sports-related injury to the ACL is so common that it is easy to overlook the significance of it. But it is by no means a trivial injury, as it can end sports careers, require surgery, and usually results in early-onset, post-traumatic osteoarthritis, triggering long-term pain and mobility problems later in life. (Wang 2020.)

72. Even in the historic context in which girls and women limit competition to (and so only collide with) other girls and women, the rate of ACL injury is substantially higher among female than male athletes. (Flaxman 2014; Lin 2019; Agel 2005.) One meta-analysis of 58 studies reports that female athletes have a 150% relative risk for ACL injury compared with male athletes, with other estimates suggesting as much as a 300% increased risk. (Montalvo 2019; Sutton 2013.) Particularly in those sports designated as contact sports, or

¹⁹ Valgus force at the knee is a side-applied force that gaps the medial knee open.

sports with frequent cutting and sharp directional changes (basketball, field hockey, lacrosse, soccer), females are at greater risk of ACL injury. In basketball and soccer, this risk extends across all skill levels, with female athletes between two and eight times more likely to sustain an ACL injury than their male counterparts. (Lin 2019 at 5.) These observations are widely validated, and consistent with the relative frequencies of ACL injuries that I see in my own practice.

73. When the reasons underlying the difference in the incidence of ACL injury between males and females were first studied in the early 1990s, researchers speculated that the difference might be attributable to females' relative inexperience in contact sports, or to their lack of appropriate training. However, a follow-up 2005 study looking at ACL tear disparities reported that, "Despite vast attention to the discrepancy between anterior cruciate ligament injury rates between men and women, these differences continue to exist." (Agel 2005 at 524.) Inexperience and lack of training do not explain the differences. Sex seems to be an independent predictor of ACL tear risk.

74. In fact, as researchers have continued to study this discrepancy, they have determined that multiple identifiable anatomical and physiological differences between males and females play significant roles in making females more vulnerable to ACL injuries than males. (Flaxman 2014; Lin 2019; Wolf 2015.) Summarizing the findings of a number of separate studies, one researcher recently cited as anatomical risk factors for ACL injury smaller ligament size,

decreased femoral notch width, increased posterior-inferior slope of the lateral tibia plateau, increased knee and generalized laxity, and increased body mass index (BMI). With the exception of increased BMI, each of these factors is more likely to occur in female than male athletes. (Lin 2019 at 5.) In addition, female athletes often stand in more knee valgus (that is, in a “knock-kneed” posture) due to wider hips and a medially-oriented femur. Often, this is also associated with a worsening of knee valgus during jump landings. The body types and movement patterns associated with these valgus knee postures are more common in females and increase the risk for ACL tear. (Hewett 2005.)

75. As with concussion, the cyclic fluctuation of sex-specific hormones in women is also thought to be a possible risk factor for ACL injury. Estrogen acts on ligaments to make them more lax, and it is thought that during the ovulatory phase of menses (when estrogen levels peak), the risk of ACL tear is higher. (Chidi-Ogbolu 2019 at 1; Herzberg 2017.)

76. Whatever the factors that increase the injury risk for ACL tears in women, the fact that a sex-specific difference in the rate of ACL injury exists is well established and widely accepted.

77. Although non-contact mechanisms are the most common reason for ACL tears in females, tears related to contact are also common, with ranges reported across multiple studies of from 20%-36% of all ACL injuries in women. (Kobayashi 2010 at 672.) For example, when a soccer player who is kicking a ball is struck by another player in the lateral knee of the stance leg, medial and

rotational forces can tear the medial collateral ligament (MCL), the ACL, and the meniscus. Thus, as participation in the female category based on identity rather than biology becomes more common (entailing the introduction of athletes with characteristics such as greater speed and lean muscle mass), and as collision forces suffered by girls and women across the knee increase accordingly, the risk for orthopedic injury and in particular ACL tears among impacted girls and women will inevitably rise.

78. Of course there exists variation in all these factors within a given group of males or females. However, it is also true that within sex-specific pools, size differential is somewhat predictable and bounded, even considering outliers. When males are permitted to enter into the pool of female athletes based on gender identity rather than biological sex, there is an increased possibility that a statistical outlier in terms of size, weight, speed, and strength—and potentially an extreme outlier—is now entering the female pool. Although injury is not guaranteed, risks to female participants will increase. And as I discuss later, the available evidence together suggests that this will be true even with respect to males who have been on testosterone suppression for a year or more. World Rugby relied heavily upon this when they were determining their own policy, and I think it is important to reiterate that this policy, rooted in concern for athlete safety, is justifiable based upon current evidence from medical research and what we know about biology.

VII. TESTOSTERONE SUPPRESSION WILL NOT PREVENT THE HARM TO FEMALE SAFETY IN ATHLETICS

79. A recent editorial in the *New England Journal of Medicine* opined that policies governing transgender participation in female athletics “must safeguard the rights of all women—whether cisgender or transgender.” (Dolgin 2020.) Unfortunately, the physics and medical science reviewed above tell us that this is not practically possible. If biological males are given a “right” to participate in the female category based on gender identity, then biological women will be denied the right to reasonable expectations of safety and injury risk that have historically been guaranteed by ensuring that females compete (and collide) only with other females.

80. Advocates of unquestioning inclusion based on gender identity often contend that hormonal manipulation of a male athlete can feminize the athlete enough that he is comparable with females for purposes of competition. The NCAA’s Office of Inclusion asserts (still accessible on the NCAA website as of this writing) that “It is also important to know that any strength and endurance advantages a transgender woman arguably may have as a result of her prior testosterone levels dissipate after about one year of estrogen or testosterone suppression therapy.”²⁰ (NCAA 2011 at 8.) Whether or not this is true is a critically important question.

²⁰ <https://www.ncaa.org/sports/2016/3/2/lesbian-gay-bisexual-transgender-and-questioning-lgbtq.aspx>

81. At the outset, we should note that while advocates sometimes claim that testosterone suppression *can* eliminate physiological advantages in a biological male, none of the relevant transgender eligibility policies that I am aware of prior to 2021 requires any demonstration that it has *actually* achieved that effect in a particular male who seeks admission into the female category. The Connecticut policy that is currently at issue in ongoing litigation permits admission to the female category at the high school level without requiring any testosterone suppression at all. Prior to their new policy, just announced in January 2022, the NCAA's policy required no demonstration of any reduction of performance capability, change in weight, or regression of any other physical attribute of the biological male toward female levels. It did not require achievement of any particular testosterone level, and did not provide for any monitoring of athletes for compliance. Moving forward, through a phasing process, the NCAA will ultimately require athletes in each sport to meet requirements of their sport's national governing body (NGB). If no policy exists, the policy of that sport's international governing body applies, or, finally, if no policy exists there, the 2015 policy of the International Olympic Committee (IOC) will apply. The 2015 IOC policy requires no showing of any diminution of any performance capability or physical attribute of the biological male, and requires achievement and compliance monitoring only of a testosterone level below 10nmol/liter—a level far above levels occurring in normal biological

females (0.06 to 1.68 nmol/L).²¹ Indeed, female athletes with polycystic ovarian disorder—a condition that results in elevated testosterone levels—rarely exceed 4.8 nmol/L, which is the basis for setting the testing threshold to detect testosterone *doping* in females at 5.0 nmol/L. Thus, males who qualify under the 2015 IOC policy to compete as transgender women may have testosterone levels—even after hormone suppression—*double* the level that would disqualify a biological female for doping with testosterone.²²

82. As Dr. Emma Hilton has observed, the fact that there are over 3000 sex-specific differences in skeletal muscle alone makes the hypothesis that sex-linked performance advantages are attributable solely to current circulating testosterone levels improbable at best. (Hilton 2021 at 200-01.)

83. In fact, the available evidence strongly indicates that no amount of testosterone suppression can eliminate male physiological advantages relevant to performance and safety. Several authors have recently reviewed the science and statistics from numerous studies that demonstrate that one year (or more) of testosterone suppression does not substantially eliminate male performance advantages. (Hilton 2021; De Varona 2021; Harper 2021.) As a medical doctor, I will focus on those specific sex-based characteristics of males who have

²¹ Normal testosterone range in a healthy male averages between 7.7 and 29.4 nmol/L.

²² In November 2021, the IOC released new guidelines, deferring decision-making about a given sport's gender-affectedness to its governing body. The current NCAA policy, however, still utilizes the 2015 IOC policy to determine an athlete's eligibility in event that the sport's national and international governing bodies lack policies to determine eligibility.

undergone normal sex-determined pubertal skeletal growth and maturation that are relevant to the *safety* of female athletes. Here, too, the available science tells us that testosterone suppression does not eliminate the increased risk to females or solve the safety problem.

84. The World Rugby organization reached this same determination based on the currently available science, concluding that male physiological advantages that “create risks [to female players] appear to be only minimally affected” by testosterone suppression. (World Rugby Transgender Women Guidelines 2020.)

85. Surprisingly, so far as public information reveals, the NCAA’s Committee on Competitive Safeguards is not monitoring and documenting instances of transgender participation on women’s teams for purposes of injury reporting. In practice, the NCAA is conducting an experiment which in theory predicts an increased frequency and severity of injuries to women in contact sports, while at the same time failing to collect the relevant data from its experiment.

86. In their recent guidelines, UK Sport determined that, “based upon current evidence, testosterone suppression is unlikely to guarantee fairness between transgender women and natal females in gender-affected sports.” (UK Sports Councils’ Equality Group Guidance 2021 at 7.) They also warned that migration to a scenario by NGBs where eligibility is determined through case-by-case assessment “is unlikely to be practical nor verifiable for entry into

gender-affected sports,” in part because “many tests related to sports performance are volitional,” and incentives on the part of those tested would align with intentional poor performance. (UK Sports Councils’ Equality Group Guidance 2021 at 8.)

87. Despite these concerns, this appears to be exactly the route that the IOC is taking, as reflected in their Framework on Fairness, Inclusion and Non-Discrimination on the Basis of Gender Identity, released in November of 2021.²³ In it, the IOC lists two disparate goals. First, that “where sports organizations elect to issue eligibility criteria for men’s and women’s categories for a given competition, they should do so with a view to . . . [p]roviding confidence that no athlete within a category has an unfair and disproportionate competitive advantage . . . [and] preventing a risk to the physical safety of other athletes.” (IOC Framework 2021 § 4.1.) At the same time, governing bodies are not to preclude any athlete from competing until evidence exists based upon “robust and peer-reviewed research that . . . demonstrates a consistent, unfair, disproportionate competitive advantage in performance and/or an unpreventable risk to the physical safety of other athletes” – research moreover that “is largely based on data collected *from a demographic group that is consistent in gender and athletic engagement with the group that the eligibility*

²³ The IOC Framework on Fairness, Inclusion and Non-Discrimination on the Basis of Gender Identity and Sex Variations is available at https://stillmed.olympics.com/media/Documents/News/2021/11/IOC-Framework-Fairness-Inclusion-Non-discrimination-2021.pdf?_ga=2.72651665.34591192.1645554375-759350959.1644946978

criteria aim to regulate.” (IOC Framework 2021 § 6.1) Finally, affected athletes may appeal any evidence-based decision-making process through a further “appropriate internal mediation mechanism, such as a Court of Arbitration for Sport.” (IOC Framework 2021 § 6.1.) Rather than cite any of the growing evidence that testosterone suppression cannot mitigate sex-based performance differences, the IOC’s new policy remains aspirational and opaque. And yet the research relating to hormonal suppression in transgender athletes, as confirmed by World Rugby and UK Sport, already speaks very clearly to the fact that males retain a competitive advantage over women that cannot be eliminated through testosterone suppression alone. What follows is a brief summary of some of these retained differences as they relate to sport safety.

A. Size and weight

88. Males are, on average, larger and heavier. As we have seen, these facts alone mean that males bring more kinetic energy into collisions, and that lighter females will suffer more abrupt deceleration in collisions with larger bodies, creating heightened injury risk for impacted females.

89. I start with what is obvious and so far as I am aware undisputed—that after the male pubertal growth spurt, suppression of testosterone does not materially *shrink* bones so as to eliminate height, leverage, performance, and weight differences that follow from simply having longer, larger bones, and being subsequently taller.

90. In addition, multiple studies have found that testosterone suppression may modestly reduce, but does not come close to eliminating the male advantage in muscle mass and lean body mass, which together contribute to the greater average male weight. Researchers looking at transitioning adolescents found that the weight of biological male subjects *increased* rather than decreased after treatment with an antiandrogen testosterone suppressor. (Tack 2018.) In one recent meta-analysis, researchers looking at the musculoskeletal effects of hormonal transition found that even after males had undergone 36 months of therapy, their lean body mass and muscle area remained above those of females. (Harper 2021.) Another group in 2004 studied the effects of testosterone suppression to less than 1 nmol/L in men after one or more years, but still found only a 12% total loss of muscle area by the end of thirty-six months. (Gooren 2004.)

B. Bone density

91. Bone mass (which includes both size and density) is maintained over *at least* two years of testosterone suppression (Singh-Ospina 2017; Figuera 2019), and one study found it to be preserved even over a median of 12.5 years of suppression (Hilton 2021; Ruetsche 2005).

C. Strength

92. A large number of studies have now observed minimal or no reduction in strength in male subjects following testosterone suppression. In one recent meta-analysis, strength loss after twelve months of hormone therapy

ranged from negligible to 7%. (Harper 2021.) Given the baseline male strength advantage in various muscle groups of from approximately 25% to 100% above female levels that I have noted in Section V.D above, even a 7% reduction leaves a large retained advantage in strength. Another study looking at handgrip strength—which is a proxy for general strength—showed a 9% loss of strength after two years of hormonal treatment in males who were transitioning, leaving a 23% retained advantage over the female baseline. (Hilton 2021.) Yet another study which found a 17% retained grip strength advantage noted that this placed the median of the group treated with hormone therapy in the 95th percentile for grip strength among age-matched females. (Scharff 2019.) Researchers looking at transitioning adolescents showed no loss of grip strength after hormone treatment. (Tack 2018.)

93. One recent study on male Air Force service members undergoing transition showed that they retained more than two thirds of pretreatment performance advantage over females in sit-ups and push-ups after between one and two years of testosterone-reducing hormonal treatment. (Roberts 2020.) Another recently-published observational cohort study looked at thigh strength and thigh muscle cross-sectional area in men undergoing hormonal transition to transgender females. After one year of hormonal suppression, this group saw only a 4% decrease in thigh muscle cross-sectional area, and a negligible decrease in thigh muscle strength. (Wiik 2020.) Wiik and colleagues looked at isokinetic strength measurements in individuals who had undergone at least 12

months of hormonal transition and found that muscle strength was comparable to baseline, leaving transitioned males with a 50% strength advantage over reference females. (Wiik 2020.) Finally, one cross-sectional study that compared men who had undergone transition at least three years prior to analysis, to age-matched, healthy males found that the transgender individuals had retained enough strength that they were still outside normative values for women. This imbalance continued to hold even after *eight* years of hormone suppression. The authors also noted that since males who identify as women often have lower baseline (i.e., before hormone treatment) muscle mass than the general population of males, and since baseline measures for this study were unavailable, the post-transition comparison may actually represent an overestimate of muscle mass regression in transgender females. (Lapauw 2008; Hilton 2021.)

94. World Rugby came to the same conclusion based on its own review of the literature, reporting that testosterone suppression “does not reverse muscle size to female levels,” and in fact that “studies assessing [reductions in] mass, muscle mass, and/or strength suggest that reduction in these variables range between 5% and 10%. Given that the typical male vs female advantages range from 30% to 100%, these reductions are small.” (World Rugby Transgender Women Guidelines 2020.)

95. It is true that most studies of change in physical characteristics or capabilities over time after testosterone suppression involve untrained subjects

rather than athletes, or subjects with low to moderate training. It may be assumed that all of the Air Force members who were subjects in the study I mention above were physically fit and engaged in regular physical training. But neither that study nor those studies looking at athletes quantify the volume or type of strength training athletes are undergoing. The important point to make is that the only effect strength training could have on these athletes is to *counteract* and reduce the limited loss of muscle mass and strength that does otherwise occur to some extent over time with testosterone blockade. There has been at least one study that illustrates this, although only over a short period, measuring strength during a twelve-week period where testosterone was suppressed to levels of 2 nmol/L. During that time, subjects actually increased leg lean mass by 4%, and total lean mass by 2%, and subject performance on the 10 rep-max leg press improved by 32%, while their bench press performance improved by 17%. (Kvorning 2006.)

96. The point for safety is that superior strength enables a biological male to apply greater force against an opponent's body during body contact, or to throw, hit, or kick a ball at speeds outside the ranges normally encountered in female-only play, with the attendant increased risks of injury that I have already explained.

D. Speed

97. As to speed, the study of transitioning Air Force members found that these males retained a 9% running speed advantage over the female control

group after one year of testosterone suppression, and their average speed had not declined significantly farther by the end of the 2.5 year study period. (Roberts 2020.) Again, I have already explained the implications of greater male speed on safety for females on the field and court, particularly in combination with the greater male body weight.

CONCLUSION

Since the average male athlete is larger and exerts greater power than the average female athlete in similar sports, male–female collisions will produce greater energy at impact, and impart greater risk of injury to a female, than would occur in most female-female collisions. Because of the well-documented physiological testing and elite performance differences in speed and strength, as well as differences in lean muscle mass that exist across all age ranges, the conclusions of this paper can apply to a certain extent before, as well as during, and after puberty. We have seen that males who have undergone hormone therapy in transition toward a female body type nevertheless retain musculoskeletal “legacy” advantages in muscle girth, strength, and size. We have also seen that the additive effects of these individual advantages create multiplied advantages in terms of power, force generation and momentum on the field of play. In contact or collision sports, sports involving projectiles, or sports where a stick is used to strike something, the physics and physiology reviewed above tell us that permitting male-bodied athletes to compete against, or on the same team as females—even when undergoing testosterone

suppression—must be expected to create predictable, identifiable, substantially increased, and unequal risks of injuries to the participating women.

Based on its independent and extensive analysis of the literature coupled with injury modeling, World Rugby recognized the inadequacy of the International Olympic Committee’s policy to preserve safety for female athletes in their contact sport (the NCAA policy is even more lax in its admission of biological males into the female category). Among the explicit findings of the World Rugby working group were the following:

- Forces and inertia faced by a smaller and slower player during collisions are significantly greater when in contact with a larger, faster player.
- Discrepancies in mass and speed (such as between two opponents in a tackle) are significant determinants of various head and other musculoskeletal injury risks.
- The risk of injury to females is increased by biological males’ greater ability to exert force (strength and power), and also by females’ reduced ability to receive or tolerate that force.
- Testosterone suppression results in only “small” reductions in the male physiological advantages. As a result, heightened injury risks remain for females who share the same field or court with biological males.
- These findings together predict a significant increase in injury rates for females in rugby if males are permitted to participate based on gender identity, *with or without testosterone suppression*, since the magnitude of forces and energy transfer during collisions will increase substantially, directly correlated to the differences in physical attributes that exist between the biological sexes.

Summarizing their work, the authors of the World Rugby Guidelines said that, “World Rugby’s number one stated priority is to make the game as safe as

possible, and so World Rugby cannot allow the risk to players to be increased to such an extent by allowing people who have the force and power advantages conferred by testosterone to play with and against those who do not.” (World Rugby Transgender Guidelines 2020.) As my own analysis above makes clear, I agree with the concerns of UK Sport and the conclusions of World Rugby regarding risk to female athletes. Importantly, I also agree that it must be a high priority for sports governing bodies (and other regulatory or governmental bodies governing sports) to make each sport as safe as reasonably possible. And in my view, medical practitioners with expertise in this area have an obligation to advocate for science-based policies that promote safety.

The *performance* advantages retained by males who participate in women’s sports based on gender identity are readily recognized by the public. When an NCAA hurdler who ranked 200th while running in the collegiate male division transitions and immediately leaps to a number one ranking in the women’s division;²⁴ when a high school male sprinter who ranked 181st in the state running in the boys’ division transitions and likewise takes first place in the girls’ division (De Varona 2021), the problem of fairness and equal opportunities for girls and women is immediately apparent, and indeed this problem is being widely discussed today in the media.

²⁴ https://en.wikipedia.org/wiki/Cece_Telfer (accessed 6/20/21)

The causes of sports injuries, however, are multivariate and not always as immediately apparent. While, as I have noted, some biological males have indeed competed in a variety of girls' and women's contact sports, the numbers up till now have been small. But recent studies have reported very large increases in the number of children and young people identifying as transgender compared to historical experience. For example, an extensive survey of 9th and 11th graders in Minnesota found that 2.7% identified as transgender or gender-nonconforming— well over 100 times historical rates (Rider 2018), and many other sources likewise report this trend.²⁵

Faced with this rapid social change, it is my view as a medical doctor that policymakers have an important and pressing duty not to wait while avoidable injuries are inflicted on girls and women, but instead to proactively establish policies governing participation of biological males in female athletics that give proper and scientifically-based priority to safety in sport for these girls and women. Separating participants in contact sports based on biological sex preserves competitive equity, but also promotes the safety of female athletes by protecting them from predictable and preventable injury. Otherwise, the hard science that I have reviewed in this white paper leaves little doubt that eligibility policies based on ideology or gender identity rather than science, will,

²⁵ https://www.nytimes.com/2016/07/01/health/transgender-population.html?mc=aud_dev&ad-keywords=auddevgate&gclid=Cj0KCQjwkZiFBhD9ARIsAGxFX8BV5pozB9LI5Ut57OQzuMhu rWThv BMisV9NyN9YTXIzWI7OAnGT6VkaAu0jEALw_wcB&gclsrc=aw.ds (accessed 6/20/21)

over time, result in increased, and more serious, injuries to girls and women who are forced to compete against biologically male transgender athletes. When basic science and physiology both predict increased injury, then leagues, policy-makers, and legislators have a responsibility to act to protect girls and women before they get hurt.

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BIBLIOGRAPHY

- Agel, J. et al., Anterior cruciate ligament injury in National Collegiate Athletic Association basketball and soccer: a 13-year review. *Am. J. Sports Med.* 33(4):524-531 (2005).
- Athletic Business, "College intramural playing rules vary greatly." <https://www.athleticbusiness.com/college/intramural-coed-basketball-playing-rules-vary-greatly.html>.
- Bahr, R. and T. Krosshaug, Understanding injury mechanisms: a key component of preventing injuries in sport. *Br. J. Sports Med* 39:324-329 (2005).
- Barboza, S.D. et al., Injuries in field hockey players: a systematic review. *Sports Med.* 48:849-66 (2018).
- Barth, J.T. et al., Acceleration-deceleration sport-related concussion: the gravity of it all. *J. Athletic Training* 36(3):253-56 (2001).
- Beachy, G. and M. Rauh, Middle school injuries: a 20-year (1988-2008) multisport evaluation. *J. Athl. Train.* 49(4):493-506 (2014).
- Berz, K. et al., Sex-specific differences in the severity of symptoms and recovery rate following sports-related concussion in young athletes. *The Physician and Sports Med.* 41(2):58-63 (2015).
- BJJ World, "Transgender MMA Fighter Fallon Fox Breaks Skull of Her Female Opponent." <https://bjj-world.com/transgender-mma-fighter-fallon-fox-breaks-skull-of-her-female-opponent/>.
- Blankenship, M.J. et al., Sex-based analysis of the biomechanics of pitching. 38th International Society of Biomechanics in Sport Conference (July 2020).
- Blumenfeld, R.S. et al., The epidemiology of sports-related head injury and concussion in water polo. *Front. Neurol.* 7(98) (2016).
- Boden, B.P. et al., Concussion incidence in elite college soccer players. *Am. J. Sports Med.* 26(2):238-241 (1998).
- Bohannon, R.W. et al., Handgrip strength: a comparison of values obtained from the NHANES and NIH toolbox studies. *Am. J. Occ. Therapy* 73(2) (March/April 2019).

- Bompadre, V. et al., Washington State's Lystedt Law in concussion documentation in Seattle public high schools. *J. Athletic Training* 49(4):486-92 (2014).
- Broshek, D.K. et al., Sex differences in outcome following sports-related concussion, *J. Neurosurg.* 102:856-63 (May 2005).
- Buckman, R. F. and Buckman, P.D., Vertical deceleration trauma: principles of management. *Surg .Clin. N. Am.* 71(2):331–44 (1991).
- Caswell, S.V., et al., Epidemiology of sports injuries among middle school students. *Brit. J. of Sports Med.* 51(4):305 (2017).
- Centers for Disease Control, CDC National Health Statistics Report Number 122, 12/20/2018.
- Centers for Disease Control, Nonfatal traumatic brain injuries from sports and recreation activities—United States, 2001-2005, *JAMA* 298(11):1271-72 (Sept 2007).
- Chevront, S.N. et al., Running performance differences between men and women: an update. *Sports Med.* 35(12):1017-24 (2005).
- Chidi-Ogbolu, N. and K. Baar, Effect of estrogen on musculoskeletal performance and injury risk. *Front. Physiol.* 9:1834 (2019).
- Chu, Y. et al., Biomechanical comparison between elite female and male baseball pitchers. *J. Applied Biomechanics* 25:22-31 (2009).
- Coleman, D.L. and W. Shreve, Comparing athletic performances: the best elite women to boys and [men](https://www.web.law.duke.edu/sites/default/files/centers/sportslaw/comparingathleticperformances.pdf). [web.law.duke.edu/sites/default/files/centers/sportslaw/comparingathleticperformances.pdf](https://www.web.law.duke.edu/sites/default/files/centers/sportslaw/comparingathleticperformances.pdf). (Accessed 06/20/21)
- Coleman, D. L. et al., Re-affirming the value of the sports exception to Title IX's general non-discrimination rule. *Duke J. of Gender and Law Policy* 27(69):69134 (2020).
- Colvin, A.C. et al., The role of concussion history and gender in recovery from soccer-related concussion. *Am. J. Sports Med.* 37(9):1699-1704 (2009).
- Covassin, T. et al., Sex differences and the incidence of concussions among collegiate athletes. *J. Ath. Training* 38(3):238-244 (2003).
- Covassin, T. et al., Sex differences in reported concussion injury rates and time loss from participation: an update of the National Collegiate Athletic

- Association Injury Surveillance Program from 2004-2005 through 2009-2009. *J. Ath. Training* 51(3):189-194 (2016).
- Covassin, T. et al., The role of age and sex in symptoms, neurocognitive performance, and postural stability in athletes after concussion. *Am. J. Sports Med.* 40(6):1303-1312 (2012).
- Dashnaw, M.L. et al., An overview of the basic science of concussion and subconcussion: where we are and where we are going. *Neurosurg. Focus* 33(6) E5 (2012).
- Davis, S.M., et al., Sex Differences in Infant Body Composition Emerge in First 5 Months of Life. *J. Pediatr. Endocrinol. Metab.* 32(11): 1235–1239 (2019)
- De Varona, D. et al., Briefing book: a request to Congress and the Administration to preserve girls’ and women’s sport and accommodate transgender athletes. Women’s Sports Policy Working Group (2021), available at <https://womenssportspolicy.org/wp-content/uploads/2021/02/Congressional-Briefing-WSPWG-Transgender-Women-Sports-2.27.21.pdf>.
- Dick, R.W., Is there a gender difference in concussion incidence and outcomes? *Br. J. Sports Med.* 43(Supp 1):i46-i50 (2009).
- Dolgin, J., Transgender women on college athletic teams – the case of Lindsay Hecox. *NEJM* 383(21):2000-2002 (2020).
- Ewing-Cobbs, et al., Persistent postconcussion symptoms after injury. *Pediatrics* 142(5):e20180939 (2018).
- Ferris, D.P. et al., The relationship between physical and physiological variables and volleyball spiking velocity. *J. Strength & Cond. Research* 9(1):32-36 (1995).
- Fields, J.B. et al., Body composition variables by sport and sport-position in elite collegiate athletics. *J. Strength & Cond. Research* 32(11):3153-3159 (Nov 2018).
- Figuera, T.M. et al., Bone mass effects of cross-sex hormone therapy in transgender people: updated systematic review and meta-analysis. *J. Endocrine Soc.* 3(5):943-964 (May 2019).
- Flaxman, T.E. et al., Sex-related differences in neuromuscular control: implications for injury mechanisms or healthy stabilization strategies? *J. Ortho. Research* 310-317 (Feb 2014).

- Forthomme, B. et al., Factors correlated with volleyball spike velocity. *AJSM* 33(10):1513-1519 (2005).
- Fung, Y.C., The application of biomechanics to the understanding of injury and healing. A.M. Nahum et al. (eds), *Accidental Injury*, Springer Science & Business Media: New York (1993).
- Gay, T., *Football physics: the science of the game*. Rodale Books (2004).
- Gilsanz, V. et al., Age at onset of puberty predicts bone mass in young adulthood. *J. Pediatr.* 158(1):100-105 (Jan 2011).
- Gooren, L.J.G. et al., Transsexuals and competitive sports. *Eur. J. Endocrinol.* 151:425-9 (2004).
- Hacherl, S.L., et al., Concussion rates and sports participation time loss in sex-comparable middle school sports. *Archives of Clinical Neuropsychology* 36:650 (2021).
- Hacherl, S.L., et al., Concussion rates in U.S. middle school athletes from the 2015-16 to 2019-20 school years. *J. Athl. Train.* 56(6s):S-21 (2021).
- Handelsman, D.J. et al., Circulating testosterone as the hormonal basis of sex differences in athletic performance. *Endocrine Reviews* 39(5):803-829 (Oct 2018).
- Harmon, K.G. et al., American Medical Society for Sports Medicine position statement: concussion in sport. *Br. J. Sports Med.* 47:15-26 (2013).
- Harper, J. et al., How does hormone transition in transgender women change body composition, muscle strength and haemoglobin? Systematic review with a focus on the implications for sport participation. *BJSM* 55(15):865-72 (2021).
- Herzberg, S.D. et al., The effect of menstrual cycle and contraceptives on ACL injuries and laxity: a systematic review and meta-analysis. *Orthop. J. Sports Med.* 5(7) (2017).
- Hewett, T.E. et al., Biomechanical measures of neuromuscular control and valgus loading of the knee predict anterior cruciate ligament injury risk in female athletes: a prospective study. *AJSM* 33(4):492-501 (2005).
- Hilton, E. N. and T.R. Lundberg, Transgender women in the female category of sport: perspectives on testosterone suppression and performance advantage. *Sports Medicine* 51:199-214 (2021).

- Hon, W.H.C. and S.H. Kock, Sports related fractures: a review of 113 cases. *J. Orthopaedic Surg.* 9(1):35-38 (2001).
- Howell, D.R. et al., Collision and contact sport participation and quality of life among adolescent athletes. *J. Athletic Training* 55(11):1174-1180 (2020).
- Hult, J.S., Women's struggle for governance in U.S. amateur athletics. *Int. Rev. for Soc. of Sports* 24(3):249-61 (1989).
- International Olympic Committee. IOC Framework on Fairness, Inclusion and Non-Discrimination on the Basis of Gender Identity and Sex Variations (2021).
- Janssen, I. et al., Skeletal muscle mass and distribution in 468 men and women aged 18-88 yr. *J. Appl. Physiol.* 89:81-88 (2000).
- Kellis, S.E. et al., The evaluation of jumping ability of male and female basketball players according to their chronological age and major leagues. *J. Strength and Conditioning Res.* 13(1):40-46 (1999).
- Kerr, Z., et al., Concussion rates in U.S. middle school athletes, 2015-16 school year, *Am. J. Prev. Med.* 53(6):914-18 (2017).
- Kirchengast, S., Sexual dimorphism in body composition, weight status and growth in prepubertal school children from rural areas of eastern Austria. *Collegium Antropologicum* 25(1):21-30 (2001).
- Kobayashi, H. et al., Mechanisms of the anterior cruciate ligament injury in sports activities: A twenty-year clinical research of 1700 athletes. *J. Sports Science & Medicine* 9:669-675 (2010).
- Kountouris, P. et al., Evidence for differences in men's and women's volleyball games based on skills effectiveness in four consecutive Olympic tournaments. *Comprehensive Psychology* 4(9) (2015).
- Kuczinski, A. et al., Trends and epidemiologic factors contributing to soccer-related fractures that presented to emergency departments in the United States. *Sports Health* 11(1):27-31 (2018).
- Kujala U.M., et al., Acute injuries in soccer, ice hockey, volleyball, basketball, judo, and karate: analysis of national registry data. *BMJ* 311(7018):1465-68 (1995).
- Kvorning, T. et al., Suppression of endogenous testosterone production attenuates the response to strength training: a randomized, placebo-

- controlled, and blinded intervention study. *Am. J. Physiol .Metab.* 291:E1325-E1332 (2006).
- La Fontaine, M.F. et al., Preliminary evidence for a window of increased vulnerability to sustain a concussion in females: a brief report. *Front. Neurol.* 10:691 (2019).
- Lapauw, B. et al., Body composition, volumetric and areal bone parameters in male-to-female transsexual persons. *Bone* 43:1016-21 (2008).
- Lin, C. et al., Sex differences in common sports injuries. *PM R* 10(10):1073-1082 (2019).
- Lombardo, M.P. and R. O. Deaner, On the evolution of sex differences in throwing. *Qu. Review of Bio.* 93(2):91-119 (2018).
- Los Angeles Times, "Volleyball star Haley Hodson had it all, until blows to her head changed everything." <https://www.latimes.com/sports/story/2020-12-08/stanford-volleyball-hayley-hodson-concussions-cte-lawsuit>.
- Magnusson, S.P. et al., The adaptability of tendon loading differs in men and women. *Int. J. Exp. Pathol.* 88:237-40 (2007).
- Marar, M. et al., Epidemiology of concussions among United States high school athletes in 20 sports. *Am. J. Sports Med.* 40(4):747-755 (2012).
- McCrory, P. et al., Consensus statement on concussion in sport—the 5th international conference on concussion in sport held in Berlin, October 2016. *BJSM* 51:838-847 (2018).
- McGroarty, N.K. et al., Sport-related concussion in female athletes: a systematic review. *Orthop. J. Sports Med.* 8(7) (2020).
- McIntosh, A.S., Risk compensation, motivation, injuries, and biomechanics in competitive sport, *Br. J. Sports Med* (39):2-3 (2005).
- McManus, A. and N. Armstrong, Physiology of elite young female athletes. *J Med & Sport Sci* 56:23-46 (2011).
- Meeuwse, W.H., Assessing causation in sports injury: a multifactorial model. *Clinical J. of Sports Med.* 4(3):166-70 (1994).
- Montalvo, A.M. et al., Anterior cruciate ligament injury risk in sport: a systematic review and meta-analysis of injury incidence by sex and sport classification. *J. Ath. Training* 54(5):472-482 (2019).

- Montalvo, A.M. et al., "What's my risk of sustaining an ACL injury while playing sports?": a systematic review with meta-analysis. *Br. J. Sports Med.* 53:10031012 (2019).
- Mooney, J. et al., Concussion in soccer: a comprehensive review of the literature. *Concussion* 5(3) (2020).
- Morris, J.S. et al., Sexual dimorphism in human arm power and force: implications for sexual selection on fighting ability. *J. Exp. Biol.* 223(Pt 2) (2020).
- National Collegiate Athletic Association, Inclusion of transgender student-athletes. https://ncaaorg.s3.amazonaws.com/inclusion/lgbtq/INC_TransgenderHandbook.pdf (August 2011).
- National Conference of State Legislatures, Report on traumatic brain injury legislation. <https://www.ncsl.org/research/health/traumatic-brain-injury-legislation.aspx#1> (2018).
- Neder, J.A. et al., Reference values for concentric knee isokinetic strength and power in nonathletic men and women from 20 to 80 years old. *J. Orth. & Sports Phys. Therapy* 29(2):116-126 (1999).
- New York Times, "Estimate of U.S. transgender population doubles to 1.4 Million adults." https://www.nytimes.com/2016/07/01/health/transgender-population.html?mc=aud_dev&ad-keywords=auddevgate&gclid=Cj0KCQjwkZiFBhD9ARIsAGxFX8BV5pozB9LI5Ut57OQzuMhurWThvBMisV9NyN9YTXIzWl7OAnGT6VkaAu0jEALw_wcB&gclid=c=aw.ds. (July 1, 2016).
- Nieves, J.W. et al., Males have larger skeletal size and bone mass than females, despite comparable body size. *J. Bone Mineral Res.* 20(3):529-35 (2005).
- Palao, J.M. et al., Normative profiles for serve speed for the training of the serve and reception in volleyball. *The Sport Journal* (July 2014).
- Pierpoint, L. et al., The first decade of web-based sports injury surveillance: descriptive epidemiology of injuries in US high school boys' (and girls) lacrosse (2008–2009 Through 2013–2014) and National Collegiate Athletic Association men's lacrosse (2004–2005 Through 2013–2014). *J. Athl. Training* 54(1):30-41 (2019).

- Preiss-Farzanegan, S.J. et al., The relationship between gender and postconcussion symptoms after sport-related mild traumatic brain injury. *PM R* 1(3):245-53 (2009).
- Rider, G.N. et al., Health and care utilization of transgender and gender nonconforming youth: a population-based study. *Pediatrics* 141:3 (March 2018).
- Roberts, T.A. et al., Effect of gender affirming hormones on athletic performance in transwomen and transmen: implications for sporting organisations and legislators. *BJSM* 0:1-7 (2020).
- Rowson, S. et al., Biomechanical perspectives on concussion in sport, *Sports Med. Arthrosc.* 24(3):100-107 (Sept 2016).
- Ruetsche, A.G. et al., Cortical and trabecular bone mineral density in transsexuals after long-term cross-sex hormonal treatment: a cross-sectional study. *Osteoporos. Int.* 16:791-798 (2005).
- Sakamoto, K. et al., Comparison of kicking speed between female and male soccer players. *Procedia Engineering* 72:50-55 (2014).
- Santos, D.A. et al., Reference values for body composition and anthropometric measurements in athletes. *PLOSOne* 9(5) (May 2014).
- Sattler, T. et al., Vertical jump performance of professional male and female volleyball players: effects of playing position and competition level. *J. Strength and Conditioning Res.* 29(6):1486-93 (2015).
- Scharff, M. et al., Change in grip strength in trans people and its association with lean body mass and bone density. *Endocrine Connections* 8:1020-28 (2019).
- Singh-Ospina, N. et al., Effect of sex steroids on the bone health of transgender individuals: a systematic review and meta-analysis. *J. Clin. Endocrinol. Metab.* 102(11):3904-13 (Nov 2017).
- Sutton, K.M. et al., Anterior cruciate ligament rupture: differences between males and females. *J. Am. Acad. Orthop. Surg.* 21(1):41-50 (2013).
- Tack, L.J.W. et al., Proandrogenic and antiandrogenic progestins in transgender youth: differential effects on body composition and bone metabolism. *J. Clin. Endocrinol. Metab.* 103(6):2147-56 (2018).
- Taylor, R.W., et al., Gender differences in body fat content are present well before puberty. *Int. J. Obes. Relat. Metab. Disord.* 21(11): 1082-4 (1997).

Taylor, R.W., et al., Sex differences in regional body fat distribution from pre- to postpuberty. *Obesity* 18(7): 1410-16 (2010).

Thomas, J.R. and K. E. French, Gender differences across age in motor performance: a meta-analysis. *Psych. Bull.* 98(2):260-282 (1985).

Tierney, R.T. et al., Gender differences in head-neck segment dynamic stabilization during head acceleration. *Med. and Sci. in Sports and Exercise, American College of Sports Medicine* 37(2):272-9 (2005).

UK Sports Councils' Equality Group, Guidance for Transgender Inclusion in Domestic Sport, <https://equalityinsport.org/docs/300921/Guidance%20for%20Transgender%20Inclusion%20in%20Domestic%20Sport%202021.pdf> (2021).

UK Sports Councils' Equality Group, International Research Literature Review, <https://equalityinsport.org/docs/300921/Transgender%20International%20Research%20Literature%20Review%202021.pdf> (2021).

Van Den Tillaar, R. and J. M. H. Cabri, Gender differences in the kinematics and ball velocity of overarm throwing in elite team handball players. *J. Sports Sciences* 30(8):807-813 (2012).

Viviers, P. et al., A review of a decade of rugby union injury epidemiology: 2007-2017. *Sports Health* 10(3):223-27 (2018).

[VolleyballMag.com](https://volleyballmag.com), "Hit by volleyballs: concussions have changed coach Corinne Atchison's life." <https://volleyballmag.com/corinneatchison/> (9/25/16).

Wang, L. et al., Post-traumatic osteoarthritis following ACL injury. *Arthritis Res. and Therapy* 22(57) (2020)

Wiik, A., T. R Lundberg et al., Muscle strength, size, and composition following 12 months of gender-affirming treatment in transgender individuals. *J. Clinical Endocrin. & Metab.* 105(3):e805-813 (2020).

Wikipedia, "Cece Telfer." https://en.wikipedia.org/wiki/Cece_Telfer.

Wolf, J.M. et al., Male and female differences in musculoskeletal disease. *J. Am. Acad. Orthop. Surg.* 23:339-347 (2015).

World Rugby Transgender Guidelines. <https://www.world.rugby/the-game/player-welfare/guidelines/transgender> (2020).

World Rugby Transgender Women Guidelines. <https://www.world.rugby/the-game/player-welfare/guidelines/transgender/women> (2020).

Wunderle, K. et al, Menstrual phase as predictor of outcome after mild traumatic brain injury in women. *J. Head Trauma Rehabil.* 29(5):E1-E8 (2014).

APPENDIX – LIST OF PUBLICATIONS

Publications of Dr. Chad Thomas Carlson, M.D., FACSM

Sports Medicine CAQ Study Guide, Healthy Learning, 2021 [editor].

SEXUAL VIOLENCE IN SPORT: AMERICAN MEDICAL SOCIETY FOR SPORTS MEDICINE POSITION STATEMENT. Published in *Curr Sports Med Reports* June 2020;19(6):232-4; *Clin J Sports Med* June 8 2020; *Br J Sports Med* 2020;0:1-3.

Traveling with Medication. *NCAA Sports Science Institute Bulletin*, 2015
<http://www.ncaa.org/sport-science-institute/traveling-medication>.

A SURVEY OF STATE MEDICAL LICENSING BOARDS: CAN THE TRAVELING TEAM PHYSICIAN PRACTICE IN YOUR STATE? 2013. *Jan* (47)1:60-62.

AXIAL BACK PAIN IN THE ATHLETE: PATHOPHYSIOLOGY AND APPROACH TO REHABILITATION. *Curr Rev Musculoskel Med*. 2009 (2):88-93.

THE NATURAL HISTORY AND MANAGEMENT OF HAMSTRING INJURIES. *Curr Rev Musculoskel Med* 2008 (1):120-128.

SPONDYLOLYSIS AND THE ATHLETE. *Athletic Ther Today*. 2007 (12)4:37-39.

“ACUTE SUBDURAL HEMATOMA IN A HIGH SCHOOL FOOTBALL PLAYER,” *J Athl Training*, 38;2(63), 2003.

THE RELATIONSHIP OF EXCESSIVE WEIGHT LOSS TO PERFORMANCE IN HIGH SCHOOL WRESTLERS – A PILOT STUDY; presented at the AMSSM national meeting, San Diego, CA, 2000; *Clinical Journal of Sport Medicine* 10(4):310, October, 2000.

CURRICULUM VITAE (ABBREVIATED)

Chad Thomas Carlson, MD

Work Address: Stadia Sports Medicine
6000 University Ave.
Suite 250
West Des Moines, IA, 50266
Phone (515) 221-1102

Active professional licenses: IA, NE, CA, TX, TN, NC, AZ, FL (telemed)

Board certified family medicine, ABMS 1998; recertified 2005, 2012

Board certified sports medicine, ABMS 1999; recertified 2009, 2019

EDUCATION:

- Fellowship: Sports Medicine -- Ball Memorial Hospital/Central Indiana Orthopedics, 1997-1999; Completed 4/99
- Residency: University of Michigan Department of Family Medicine, 1994-97
- University of Nebraska College of Medicine
M.D. obtained May 1994
- University of Nebraska at Lincoln
B.S. with majors in history (emphasis American) and biology obtained May 1990

EMPLOYMENT HISTORY:

- Physician Owner, Stadia Sports Medicine, West Des Moines, IA, 2006 - present
- Staff Physician, University of Illinois, 9/04-6/06
- Director, Carle Sports Medicine, Carle Foundation Hospital, Urbana, IL, 2001-2004; Team physician, University of Illinois.
- Private practice, Ionia County Hospital, Ionia, MI, 1999-2001.

HOSPITAL AFFILIATIONS:

- Iowa Methodist Hospital, Des Moines
- Mercy Medical Center, Des Moines

PROFESSIONAL HONORS/AWARDS:

- Appointed to Board of Directors, Physical Activity Alliance, 2020
- Appointed to joint AMSSM/NCAA COVID-19 Working Group, March 2020-present
 - Medical advisory panel, 2021 Women's Division I NCAA Basketball Tournament
- AMSSM Founders Award 2019, awarded once annually for the Sports Medicine Physician nationally who best exemplifies the practice of Sports Medicine
- Fellow designation, American Medical Society for Sports Medicine, 2019
- Elected to Executive Committee, American Medical Society for Sports Medicine, 2017-21
 - **President of AMSSM, 2019-2020**

- Practice/Policy Committee, AMSSM, 2007-2016 (Former Chair)
 - Author of US HR 921, the Sports Medicine Licensure Clarity Act, which passed the US House of Representatives and Senate in January 2017, and was signed into law by President Trump, 2017
- Appointed member of physician liaison group to the NCAA to discuss return to sport strategies in the COVID-19 pandemic, 2020
- Appointed to Board of Directors, Running the Race, 2018-present
- Sports Ultrasound Committee, Policy Co-Chair, AMSSM, 2015-2017
- Elected to Board of Directors, American Medical Society for Sports Medicine, 2009-2013.
- Member, Health and Science Policy Committee, ACSM, 2010-present
 - Chair, Clinical Medicine Subcommittee, HSPC, ACSM, 2012-2015
- Iowa Medical Society Leadership Development Committee, 2022
- Member of Sports Medicine Subcommittee for the Iowa State Medical Society, 2007-present
 - Iowa designate to National Youth Sports Safety Summit
 - New York City – 2015
 - Indianapolis – 2016
 - Kansas City – 2017
- AMSSM designate for the American Academy of Orthopaedic Surgeons' Knee Osteoarthritis Quality Measure review committee, 2014-2016
- Associate Editor, Current Reviews in Musculoskeletal Medicine, 2006-2010.
- Fellow, American College of Sports Medicine: Designated in 2004

SPECIAL QUALIFICATIONS:

- Prior legal consulting work in cases with both local and national reach
- Extensive training in office musculoskeletal injury
- Oversight of treadmill stress testing/metabolic stress testing
- Independent consultation regarding establishment of individual exercise programs consistent with revised ACSM guidelines
- Proficient at evaluation/management of bone mineral density problems at all ages
- Qualified procedurally for:
 - Ultrasound diagnostic testing and guided injections
 - Joint injection/aspiration
 - Percutaneous tenotomy (TENEX)
 - Rotator cuff barbotage
 - Lactate/Anaerobic threshold, VO₂ MAX/ exercise testing
 - Laryngoscopy for vocal cord assessment
 - Compartment pressure assessment
 - Ultrasound-guided nerve blocks
- Extensive experience speaking to large national groups on issues pertaining to sports medicine, including, but not limited to:
 - Overuse Injury
 - Head and Neck Injuries on the Field
 - Exercise-Induced Asthma
 - The Shoulder Exam
 - Principles of Exercise Prescription
 - Traumatic Brain Injury in Sport
 - The Knee Exam
 - The Ankle Exam
 - The Hip Exam
 - The Pre-Participation Exam
 - Cardiopulmonary Exercise Testing for Determination of Training Zone Estimates and to Identify Causes of Exercise-Related Dyspnea
 - Athletic Amenorrhea
 - Advocacy in Sports Medicine
 - Medical Practice Economics

PUBLICATIONS/RESEARCH:

- Sports Medicine CAQ Study Guide, Healthy Learning, Monterey, CA. 2021.[editor].
- AXIAL BACK PAIN IN THE ATHLETE: PATHOPHYSIOLOGY AND APPROACH TO REHABILITATION. Curr Rev Musculoskel Med. 2009 (2):88-93
- SPONDYLOLYSIS AND THE ATHLETE. Athletic Ther Today. 2007 (12)4:37-39.
- THE NATURAL HISTORY AND MANAGEMENT OF HAMSTRING INJURIES. Curr Rev Musculoskel Med 2008 (1):120-128.
- A SURVEY OF STATE MEDICAL LICENSING BOARDS: CAN THE TRAVELING TEAM PHYSICIAN PRACTICE IN YOUR STATE? BJSM. 2013. Jan (47)1:60-62.
- SEXUAL VIOLENCE IN SPORT: AMERICAN MEDICAL SOCIETY FOR SPORTS MEDICINE POSITION STATEMENT
 - Curr Sports Med Reports June 2020;19(6):232-4.
 - Clin J Sports Med June 8 2020;
 - Br J Sports Med 2020;0:1-3
- “ACUTE SUBDURAL HEMATOMA IN A HIGH SCHOOL FOOTBALL PLAYER,” J Athl Training, 38;2(63), 2003
- Traveling with Medication. NCAA Sports Science Institute Bulletin, 2015 <http://www.ncaa.org/sport-science-institute/traveling-medication>
- THE RELATIONSHIP OF EXCESSIVE WEIGHT LOSS TO PERFORMANCE IN HIGH SCHOOL WRESTLERS – A PILOT STUDY; presented at the AMSSM national meeting, San Diego, CA, 2000 Clinical Journal of Sport Medicine 10(4):310, October, 2000

Exhibit 32

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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

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)
 B.P.J. by her next friend and)
 mother, HEATHER JACKSON,)
)
 Plaintiff,)
)
 vs.) No. 2:21-cv-00316
)
)
 WEST VIRGINIA STATE BOARD OF)
 EDUCATION, HARRISON COUNTY)
 BOARD OF EDUCATION, WEST)
 VIRGINIA SECONDARY SCHOOL)
 ACTIVITIES COMMISSION, W.)
 CLAYTON BURCH in his official)
 capacity as State)
 Superintendent, DORA STUTLER,)
 in her official capacity as)
 Harrison County)
 Superintendent, and THE STATE)
 OF WEST VIRGINIA,)
)
 Defendants.)
)
 LAINEY ARMISTEAD,)
)
)
 Defendant-Intervenor.)
)

REMOTE VIDEOTAPED DEPOSITION OF
CHAD T. CARLSON, M.D., FACSM
Monday, March 28, 2022
Volume I

Reported by:
ALEXIS KAGAY
CSR No. 13795
Job No. 5122881
PAGES 1 - 227

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IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF WEST VIRGINIA
CHARLESTON DIVISION

_____)
)
 B.P.J. by her next friend and)
 mother, HEATHER JACKSON,)
)
 Plaintiff,)
) No. 2:21-cv-00316
 vs.)
)
 WEST VIRGINIA STATE BOARD OF)
 EDUCATION, HARRISON COUNTY)
 BOARD OF EDUCATION, WEST)
 VIRGINIA SECONDARY SCHOOL)
 ACTIVITIES COMMISSION, W.)
 CLAYTON BURCH in his official)
 capacity as State)
 Superintendent, DORA STUTLER,)
 in her official capacity as)
 Harrison County)
 Superintendent, and THE STATE)
 OF WEST VIRGINIA,)
)
 Defendants.)
)
 LAINEY ARMISTEAD,)
)
)
 Defendant-Intervenor.)
)

_____)
 Videotaped deposition of CHAD T. CARLSON,
 M.D., FACSM, Volume I, taken on behalf of Plaintiff,
 with all participants appearing remotely, beginning
 at 9:01 a.m. and ending at 3:19 p.m. on Monday,
 March 28, 2022, before ALEXIS KAGAY, Certified
 Shorthand Reporter No. 13795.

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16 Also Present:

17 MITCH REISBORD - VERITEXT CONCIERGE

18

19 Videographer:

20 KIMBERLEE DECKER

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INDEX

WITNESS EXAMINATION

CHAD T. CARLSON, M.D., FACSM

Volume I

BY MR. BLOCK 13

EXHIBITS

NUMBER DESCRIPTION PAGE

Exhibit 80 Declaration of Dr. Chad T. 27
Carlson, M.D., FACSM

Exhibit 81 Declaration of Dr. Chad T. 28
Carlson, M.D., FACSM White Paper

Exhibit 82 CMDA Ethics Statement, 33
Transgender Identification

Exhibit 83 Tack Document, "Proandrogenic and 169
Antiandrogenic Progestins in
Transgender Youth: Differential
Effects on Body Composition and
Bone Metabolism"

1 Exhibit 84 "Suppression of endogenous 176
2 testosterone production
3 attenuates the response to
4 strength training: a randomized,
5 placebo-controlled, and blinded
6 intervention study"

7
8 Exhibit 85 Rider Document "Health and Care 215
9 Utilization of Transgender and
10 Gender Nonconforming Youth: A
11 Population-Based Study"

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Monday, March 28, 2022

9:01 a.m.

THE VIDEOGRAPHER: Good morning. We are on the record at 9:01 a.m. on March 28th of 2022.

All participants are attending remotely. 09:01:01

Audio and video recording will continue to take place unless all parties agree to go off the record.

This is media unit 1 of the recorded deposition of Dr. Chad T. Carlson, taken by counsel for the plaintiff, in the matter of B.P.J., by her next friend and mother, Heather Jackson, versus West Virginia State Board of Education, et al., filed in the U.S. District Court, Southern District of West Virginia, Charleston Division, Case Number 2:21-cv-00316. 09:01:19 09:01:38

My name is Kimberlee Decker from Veritext Legal Solutions, and I am the videographer. The court reporter is Alexis Kagay.

I am not related to any party in this action, nor am I financially interested in the outcome. 09:01:54

Counsel and all present will now state their appearances and affiliations for the record. If there are any objections to proceeding, please state them at the time of your appearance, beginning with 09:02:07

1 the noticing attorney.

2 MR. BLOCK: Good morning. This is Josh Block
3 from the ACLU on behalf of Plaintiff. And I'll have
4 my co-counsel introduce themselves.

5 MS. HARTNETT: Good morning. This is 09:02:22
6 Kathleen Hartnett from Cooley, LLP, for Plaintiff.

7 MR. BARR: Good morning. Andrew Barr from
8 Cooley, LLP, for Plaintiff.

9 MS. KANG: Good morning. Katelyn Kang from
10 Cooley, LLP, for Plaintiff. 09:02:38

11 MS. HELSTROM: Hello. This is Zoe Helstrom
12 from Cooley, LLP, for Plaintiff.

13 MS. PELET DEL TORO: Good morning. This is
14 Valeria Pelet del Toro from Cooley, LLP, for
15 Plaintiff.

16 COUNSEL SWAMINATHAN: Good morning. This is
17 Sruti Swaminathan from Lambda Legal on behalf of
18 Plaintiff.

19 MR. FRAMPTON: Good morning. Hal Frampton
20 from Alliance Defending Freedom on behalf of the 09:02:57
21 intervenor.

22 MS. CSUTOROS: Hello. Rachel Csutoros from
23 Alliance Defending Freedom on behalf of the
24 intervenor.

25 MR. TRYON: This is David Tryon with the 09:03:05

1 West Virginia Attorney General's Office representing
2 the State of West Virginia.

3 And just to clarify for the record, the time
4 starting was Central Time, so 9:00 a.m., Central
5 Time. 09:03:18

6 MR. CROPP: This is Jeffrey Cropp with
7 Steptoe & Johnson representing defendant Harrison
8 County Board of Education and Dora Stutler.

9 MS. MORGAN: This is Kelly Morgan with
10 Bailey & Wyant representing the West Virginia Board 09:03:34
11 of Education and Superintendent Burch.

12 MS. GREEN: This is Roberta Green,
13 Shuman McCuskey Slicer, here on behalf of
14 West Virginia Secondary School Activities
15 Commission.

16 THE VIDEOGRAPHER: Thank you.

17 Will the court reporter please swear in the
18 witness.

19 (Witness sworn.)

20 MR. BLOCK: Great.

21

22 CHAD T. CARLSON, M.D., FACSM,
23 having been administered an oath, was examined and
24 testified as follows:
25

EXAMINATION

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BY MR. BLOCK:

Q Good morning, Dr. Carlson. My name is
Josh Block from the ACLU. I'll be taking your
deposition today.

09:04:22

Could you state your whole name for the
record.

A My name is Chad Thomas Carlson.

Q Have you ever had your deposition taken
before?

09:04:30

A In a couple of local cases, yes.

Q All right. What were those?

A I can't recall. One was -- I -- I was
retained as a witness in a traffic case and can't
recall the -- and that never went to trial. And
then I was retained as a witness in an injury case
in a gym, and that also never went to trial. I was
deposed in a local case once. I can't remember the
circumstance. It was over ten years ago.

09:04:48

Q Do you remember if those cases were -- if any
of those were in federal court?

09:05:11

A No, never --

Q Okay.

A -- in federal court.

Q Okay. So maybe you'll remember some of this

09:05:17

1 discussion from ten years ago, but if not, here's a
2 refresher. I just want to go over ground rules
3 for -- for the deposition, and I have -- I have
4 three main ground rules.

5 The first is that, you know, although we have 09:05:31
6 the video, the court reporter is also trying to
7 write down everything we say, so it's important that
8 your responses be verbal, by saying "yes" or "no"
9 instead of nodding or shaking your head.

10 Is that okay with you? 09:05:46

11 A I understand that, and that's fine.

12 Q Great. And -- and you didn't nod your head,
13 which is what some people do in response to that
14 first ground rule, so you're already off to a good
15 start. 09:05:59

16 The second is, again, related to the
17 transcript, that the court reporter can't write down
18 when two people are talking at the same time, so
19 it's important that you wait until I finish the
20 question before you answer, and in return, I'll wait 09:06:10
21 for you to finish your answer before I ask another
22 question.

23 Does that sound fair?

24 A I appreciate that, and yes.

25 Q Okay. And the third is that, you know, it's 09:06:20

1 my job to ask questions that you understand and that
2 you can provide an answer to. So if anything in my
3 question is unclear, I'm asking you to let me know,
4 and I will rephrase it, okay?

5 A Okay. 09:06:35

6 Q And if you do answer the question, I'm going
7 to take that to mean that you understood it.

8 Does that sound okay to you?

9 A That's reasonable, yes.

10 Q Okay. How did you prepare for this 09:06:46
11 deposition?

12 MR. FRAMPTON: Josh, real quick, before we do
13 that, this seems like a good time to memorialize our
14 typical understanding that all objections except to
15 form and scope are reserved; is that fair? 09:07:03

16 MR. BLOCK: Yes. And we will agree again
17 that although any defendant can object, an objection
18 by one defendant preserves the objection for all of
19 them.

20 MR. FRAMPTON: Okay. Thank you. 09:07:16

21 MR. TRYON: This is Dave Tryon. I agree with
22 that.

23 MR. BLOCK: Okay. And unless another party
24 speaks up, we'll take that as agreement for
25 everyone. 09:07:34

1 BY MR. BLOCK:

2 Q Okay. How did you prepare for this
3 deposition?

4 A I reread through my statement, I read through
5 the Safer rebuttal, and I met with counsel several 09:07:43
6 times and reviewed some of the citations in the
7 paper.

8 Q In which paper?

9 A In my white paper, sorry.

10 Q When you say your white paper, are you 09:08:04
11 referring to your expert report submitted in
12 February of 2022?

13 A Yes.

14 Q Okay. Did you review any other -- any
15 documents to prepare for this deposition besides 09:08:20
16 your report and Dr. Safer's report?

17 A As I said, I reviewed some relevant papers,
18 yes.

19 Q Did you review anything that wasn't already
20 cited in your expert report? 09:08:36

21 A I -- I reviewed the FIMS paper from 2021. I
22 reviewed a paper by Klaver. I reviewed some data
23 on (technical difficulty) by Tomkinson.

24 Q I'm sorry, the audio cut out.

25 A I said, I reviewed some data on youth 09:09:18

1 performance by Tomkinson.

2 I reviewed Gregg Brown's report.

3 Q Did you review a transcript of Dr. Brown's
4 deposition?

5 A Can you clarify what you're asking? 09:09:40

6 Q Yeah. Did you -- so Dr. Brown had a
7 deposition on Friday.

8 Have you reviewed a transcript of that
9 deposition?

10 A No. 09:09:50

11 Q Okay. Is there any other additional research
12 you conducted?

13 A Not that I can think of offhand.

14 Q Okay. So you -- you mentioned before, in
15 response to my questions about whether you've had a 09:10:11
16 deposition, some cases in which you had been a
17 witness.

18 In which of those cases were you retained as
19 an expert witness?

20 A I believe the -- well, I was -- none of 09:10:30
21 these -- when -- when I was retained as -- I was
22 retained in a witness in all of them, I believe.

23 Q Okay. So you weren't -- you weren't like
24 a -- a firsthand witness to a traffic accident?

25 A No. No. I -- no. It had to do with the 09:10:49

1 nature of the injuries.

2 Q I see. So other than those three cases we
3 discussed, is there any other case in which you've
4 been retained as an expert witness?

5 A Oh. I'm sorry, yes, I have been retained by 09:11:03
6 the State of Florida in a case similar to this. I'm
7 sorry.

8 Q And have you submitted an expert report in
9 that Florida case?

10 A I've submitted a different version of a white 09:11:20
11 paper -- of the white paper that I submitted to the
12 State of West Virginia.

13 Q And have you been deposed in that case?

14 A No.

15 Q Is there any other case in which you've been 09:11:36
16 retained as an expert, even in a nontestifying role?

17 A Not that I can recall, no.

18 Q Okay. If -- if you recall over the course of
19 this deposition, can you please bring that to my
20 attention? 09:11:51

21 A Absolutely.

22 Q Okay. What -- what was your -- what is your
23 hourly rate as an expert witness in this case?

24 A I'm being paid \$650 an hour for review and
25 \$800 an hour for deposition time. 09:12:09

1 Q And is that the hourly rate you use in the
2 Florida case as well?

3 A Yes.

4 Q Is that your standard hourly rate for -- for
5 whenever you appear as an expert witness? 09:12:25

6 A For local cases, no.

7 Q What's your hourly rate for local cases?

8 A I'd have to go back and look, but I believe
9 it's somewhere around \$500 an hour.

10 Q And -- and how did you determine that as your 09:12:40
11 hourly rate?

12 A How did I determine what?

13 Q Sorry, the \$650 an hour, how did you
14 determine that as your hourly rate?

15 A I can't speak to that. I -- it's the -- 09:13:02
16 it's -- I was -- I tried to -- to be consistent with
17 each state that is talking to me, and that's the
18 rate we came down on.

19 Q Okay. So I have some questions for you just
20 about terminology so we can make sure we're 09:13:46
21 understanding each other.

22 Do you know what the term "cisgender" means?

23 MR. FRAMPTON: Object to the form.

24 And, Josh, can we do our standing objection
25 as to terminology? 09:13:59

1 MR. BLOCK: Yes, absolutely.

2 MR. FRAMPTON: Thank you.

3 BY MR. BLOCK:

4 Q But you can answer. Do you know what the

5 term --

09:14:03

6 MR. FRAMPTON: Yes, go ahead and answer.

7 THE WITNESS: I'm familiar with the term,

8 yes.

9 BY MR. BLOCK:

10 Q Okay. What -- what do you understand the

09:14:07

11 term to mean?

12 A Well, the terminology is not what I use, but
13 what I understand a cisgender individual to be is an
14 individual who, for example, is a biologically born
15 male who identifies as a male.

09:14:29

16 Q So if -- if I use the term "cisgender" in my
17 questions, you can understand what I'm talking
18 about?

19 A I can understand what you're talking about.

20 I would prefer the term "natal male," but...

09:14:42

21 Q Okay. Well --

22 A I can understand what you're talking about.

23 Q Okay. So -- so to you -- well --

24 A Or "biological male."

25 Q But to the extent that I want to distinguish

09:14:57

1 between someone who is transgender and someone who
2 is not, I -- I may ask you questions that -- that
3 use the term "cisgender."

4 So just to confirm, I want to -- you will
5 understand what I'm referring to when I say 09:15:15
6 "cisgender"; correct?

7 A Yes, I will understand what you're referring
8 to.

9 Q Okay. And do you know what the term
10 "transgender" means? 09:15:22

11 A I believe I understand what you're saying,
12 yes.

13 Q What -- what does it mean?

14 A I believe a transgender male, most likely by
15 your definition, would be an individual that is born 09:15:33
16 a certain sex but identifies as the opposite sex.

17 Q Okay. So if I use the word "transgender,"
18 you'll know what I'm talking about?

19 A Yes, if you use the word "transgender," I
20 will know what you're talking about. 09:15:55

21 Q Do you have any objection to using the word
22 "transgender" yourself?

23 A I -- I choose to use the -- the term
24 "biological male" and "biological female." I
25 believe that that's an appropriate designator, but I 09:16:11

1 have -- I can understand your terminology, and I'm
2 comfortable using it.

3 Q So -- so how -- so, in your words, if -- if
4 you want -- you wanted to, you know, describe, you
5 know, a -- a transgender woman and to distinguish 09:16:27
6 between a transgender woman and a cisgender man, how
7 would you -- how would you explain the difference
8 between a transgender woman and a cisgender man,
9 using your preferred terminology?

10 A I would probably use the -- 09:16:42

11 MR. FRAMPTON: Object to the form.

12 Go ahead and answer.

13 THE WITNESS: I would probably use the
14 descriptor and just say a biological male
15 identifying as female. 09:16:50

16 And, I'm sorry, you said cisgender what?

17 BY MR. BLOCK:

18 Q Man.

19 A Again, I would use the descriptor and say a
20 biological male identifying as male. 09:16:59

21 Q Do you -- do you think that -- do you think
22 that being transgender is a real thing?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: Define what you mean by "real
25 thing." 09:17:38

1 BY MR. BLOCK:

2 Q Well, do you think that -- do -- do you -- I
3 think, you know -- well, what do you understand
4 gender identity to be?

5 MR. FRAMPTON: Object to the form. 09:18:02

6 Go ahead.

7 THE WITNESS: Well, I was retained in this
8 case as a witness for sports safety, so I don't know
9 that I was really retained to provide an opinion
10 here, but to the extent that I understand it, I 09:18:16
11 understand gender identity to mean the extent to
12 which a person perceives themselves as being a
13 certain sex.

14 BY MR. BLOCK:

15 Q Did you receive any -- as part of your -- 09:18:45
16 well, actually, I'll come back to that. I'm sorry
17 for jumping ahead a little bit.

18 What -- you've been using the phrase
19 "biological sex." What -- what's your understanding
20 of what that term means? 09:18:58

21 A I would look to the -- the common parlance of
22 that, which is the biological characteristics that a
23 person is born with that -- that identify them as
24 male or female. And if you want to extend it to
25 chromosomal analysis, the great majority of people 09:19:22

1 that subcategorize into XY or XX.

2 Q And how would you refer to the biological sex
3 for the minority of people that don't subcategorize
4 into XY or XX?

5 A Well, I -- 09:19:40

6 MR. FRAMPTON: Object to the form.

7 Go ahead.

8 THE WITNESS: I'm a board-certified sports
9 medicine physician. I'm not an endocrinologist.

10 And even though I've studied endocrinology to some 09:19:49
11 extent in my training, I -- I wasn't really retained
12 to offer an opinion on that.

13 BY MR. BLOCK:

14 Q Okay. So you're not offering an opinion
15 today on -- on -- an expert opinion today on -- on 09:19:59
16 the definition of biological sex?

17 MR. FRAMPTON: Object to the form.

18 Go ahead.

19 THE WITNESS: I was -- I was retained today
20 to offer an opinion on the issue of sports safety as 09:20:14
21 pertains to biological males crossing over into
22 female sports.

23 BY MR. BLOCK:

24 Q So do you -- are you offering an expert
25 opinion on the safety of people with DSDs, 09:20:29

1 differences of sexual development, participating in
2 women's sports?

3 MR. FRAMPTON: Same objection.

4 Go ahead.

5 THE WITNESS: My report does not speak to 09:20:46
6 that specifically, no.

7 BY MR. BLOCK:

8 Q Okay. So do you know what complete androgen
9 insensitivity syndrome is?

10 A I'm familiar with it, yes. 09:20:53

11 Q Okay. So you're not offering an expert
12 opinion on the safety implications of allowing
13 someone with complete androgen insensitivity
14 syndrome to participate in women's sports; right?

15 MR. FRAMPTON: Object to the form. 09:21:09

16 Go ahead.

17 THE WITNESS: Well, first of all, my report
18 speaks to safety issues and whether there are risks
19 for (technical difficulty) faster individuals to
20 participate in pools of athletes who don't share 09:21:30
21 those same traits. It's not my job to create policy
22 or decide which groups are more appropriate.

23 BY MR. BLOCK:

24 Q I understand that. I'm just trying to
25 determine whether you're offering an expert opinion 09:21:44

1 on whether someone with complete androgen
2 insensitivity syndrome, who has XY chromosomes, can
3 safely participate in women's sports; right? You're
4 not offering that opinion today?

5 A I am not. 09:22:02

6 MR. FRAMPTON: Object to the form.

7 Go ahead.

8 THE WITNESS: I -- I'm not offering that
9 opinion, no.

10 BY MR. BLOCK: 09:22:07

11 Q Okay. Do you know what the term "sex
12 assigned at birth" is?

13 A Do I know what the term -- can you --

14 Q Do you understand --

15 A I believe I do, yes. 09:22:26

16 Q Sure, sure.

17 What -- what do you understand the -- the
18 term "sex assigned at birth" to refer to?

19 A I would bring that back to common parlance
20 and just say that it's -- it's the determination 09:22:39
21 that's made based on visual evidence at the time
22 that the baby is born.

23 Q Okay. Thank you.

24 All right. Now we get to look at some

25 documents. So if you can get your Exhibit Share 09:22:57

1 ready, I'm going to mark the first document for you,
2 and it will, hopefully, appear in your -- your
3 folder as Exhibit 80. Let's see if that actually
4 works.

5 (Exhibit 80 was marked for identification 09:23:20
6 by the court reporter and is attached hereto.)

7 THE WITNESS: Do I need to hit refresh on
8 this computer?

9 BY MR. BLOCK:

10 Q You -- you might. Actually -- 09:23:27

11 MR. FRAMPTON: I'll jump in. Yeah, as he
12 adds exhibits, we're going to have to refresh for
13 the exhibit to pop up in your folder.

14 Right?

15 MR. BLOCK: Yes. 09:23:38

16 And could we go off the record for a second?

17 I have a question for the concierge, just about
18 the -- the --

19 MR. FRAMPTON: Sure. That's fine with me.

20 THE VIDEOGRAPHER: We're off the record at 09:23:48
21 9:24 a.m.

22 (Recess.)

23 THE VIDEOGRAPHER: We are on the record at
24 9:24 a.m.

25 ///

1 BY MR. BLOCK:

2 Q All right. So if you can let me know when
3 Exhibit 80 appears in your folder.

4 A Okay. I see it. I'm pulling it up.

5 Q Great. Do you recognize this document? 09:24:32

6 A Yes. I believe that this is the declaration
7 I signed with the State of West Virginia.

8 Q Great. And what's the date on the document?

9 A February 23rd, 2022.

10 Q And that's your signature along with it? 09:24:51

11 A That is my signature, yes.

12 Q Okay. And have you filed any other reports
13 or declarations in this case?

14 A I filed a copy of a white paper that speaks
15 to sports safety. 09:25:12

16 MR. BLOCK: So I'm going to introduce
17 Exhibit 81, which should appear in your -- in your
18 folder in one second.

19 (Exhibit 81 was marked for identification
20 by the court reporter and is attached hereto.) 09:25:28

21 THE WITNESS: Let me figure out how to close
22 out of this.

23 So is it Exhibit G?

24 BY MR. BLOCK:

25 Q Yeah. So if you -- 09:25:46

1 A Yeah.

2 Q So if you look at the second page --

3 A Yes.

4 Q -- is that your -- your signature again,

5 Dr. Chad T. Carlson, M.D.? 09:25:54

6 A It is, yes.

7 Q Okay. And is this the -- the declaration and
8 copy of the white paper that you're referring to?

9 A This was executed June 22nd, 2021, so I
10 believe that this was prior to a preliminary 09:26:13
11 injunction.

12 Q So it's submitted in connection with opposing
13 the motion for preliminary injunction in this case?

14 A Correct, yes.

15 Q Okay. And if you go to the next page, it -- 09:26:23
16 it says, "White Paper by Dr. Chad Thomas Carlson,
17 MD."

18 Do you see that?

19 A I do, yes.

20 Q And the date of that white paper is 09:26:35
21 June 22nd, 2021; correct?

22 A Correct.

23 Q So that's the same day as your declaration is
24 dated; correct?

25 A I'd have to -- I can look, but I -- yes, it 09:26:45

1 is.

2 Q Have -- are there any earlier versions of
3 this white paper that you've authored?

4 A Earlier than the June 22nd version that you
5 have here? 09:27:02

6 Q Yes.

7 A No.

8 Q Okay. So you -- did you author this white
9 paper specifically for purposes of this litigation?

10 A When you say "this litigation," do you mean 09:27:14
11 West Virginia's suit?

12 Q Yes.

13 A No. It just -- the -- the timing of
14 completion of it coincided with the -- the deadline
15 for the case. 09:27:32

16 Q Who retained you to write this white paper?

17 MR. FRAMPTON: Objection to form.

18 Go ahead.

19 THE WITNESS: Alliance Defending Freedom.

20 BY MR. BLOCK: 09:27:42

21 Q And when did they retain you to write the
22 white paper?

23 A I was contacted by ADF in, I believe,
24 February of 2020, at a time that I was president of
25 our national academy. 09:28:01

1 Q What national academy?

2 A The American Medical Society for Sports
3 Medicine.

4 It was, I believe, Christiana Holcomb, and
5 she said that they had interest in retaining an 09:28:15
6 expert to speak on sports safety with transgender
7 sports for a pending litigation.

8 Q And you said this was in February 2020?

9 A Yes.

10 Q So about a year and a half before this white 09:28:31
11 paper was finalized?

12 A Correct.

13 Q Okay. And did you -- so were you actually
14 retained in February 2020?

15 A No. 09:28:47

16 Q Okay. When were you actually retained?

17 A It would have been towards the end of 2020.

18 Q And without --

19 A I had -- sorry.

20 Q No, you go ahead. 09:28:59

21 A I had made initial contact with Roger Brooks,
22 following their -- their initial contact, and we had
23 been scheduled to meet sometime the second week of
24 March, and that was right when COVID exploded. I
25 own a private practice, and our -- our volume went 09:29:36

1 to about 15 percent of year before, and so we had
2 other concerns, so... It deferred conversation of
3 this for a while.

4 Q Are things looking better now?

5 A Yes. 09:29:57

6 Q Good. I'm glad to hear that.

7 So you -- so when -- you -- you say the
8 initial contact was from ADF to you, not you to ADF;
9 correct?

10 A Correct. 09:30:11

11 Q Okay. And without revealing any contents of
12 your communications with ADF, do you have any
13 independent understanding of why you might have been
14 seen as a potential expert as opposed to some other
15 person who does sports medicine? 09:30:34

16 MR. FRAMPTON: And just quickly, as -- as --
17 as Mr. Block instructed you, don't reveal the
18 substance of your conversations with folks at ADF,
19 but to the extent you can answer the question
20 without doing that, please do so. 09:30:49

21 THE WITNESS: Well, I can't speak to what
22 people at ADF were thinking. I should say that I --
23 I believe that the introduction was made through a
24 third party, and I -- I believe that they probably
25 got my name from Christian Medical/Dental 09:31:13

1 Association and their policy person, and I can't
2 recall his name. And I think that the fact that I
3 was head of our national organization at the time
4 probably played into it.

5 BY MR. BLOCK:

09:31:40

6 Q What -- what is the Christian Medical/Dental
7 Association?

8 A It's just an organization of Christian
9 physicians and dentists. I have very little
10 involvement with them. I pay dues periodically.

09:31:55

11 Q So you are a member of the Christian/Medical
12 Dental Association?

13 A I might be. I honestly don't recall whether
14 I'm current on my dues or not.

15 Q Okay. Have you read -- are you aware of the
16 Christian Medical/Dental Association's policies with
17 respect to transgender people?

09:32:10

18 A No, I'm not.

19 MR. BLOCK: Hold on. I'm going to -- if you
20 give me half a second, I will show something to you.

09:32:41

21 This is going to pop up in your -- your
22 folder as Exhibit 82, I believe. Let me know when
23 you see it.

24 (Exhibit 82 was marked for identification

25 by the court reporter and is attached hereto.) 09:33:16

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1 THE WITNESS: It's refreshing. Hold on.

2 Okay. I see it.

3 BY MR. BLOCK:

4 Q Okay. Have you ever seen this document
5 before? 09:33:23

6 A I don't believe so, no.

7 Q Okay. If you look at the -- the document --
8 here, I -- I want to give you, you know, the time,
9 whatever time you need, to look at it, but I would
10 like to just direct your -- your attention to -- let 09:33:41
11 me scroll down myself.

12 So if you go to page 2 of that document, near
13 the end, it says "Accordingly" -- do you see the --
14 the line that begins "Accordingly"?

15 A I do, yes. 09:34:12

16 Q Okay. And it says (as read):

17 "Accordingly, CMDA opposes medical
18 assistance with gender
19 transitions (sic) on the following
20 grounds." 09:34:21

21 Do you see that?

22 A Yes.

23 Q Okay. And do you -- do you also oppose
24 medical assistance with gender transition on
25 biblical grounds? 09:34:36

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1 MR. FRAMPTON: Object to the form and scope.

2 THE WITNESS: Can you clarify that question?

3 BY MR. BLOCK:

4 Q Sure. It says (as read):

5 "CMDA opposes medical assistance 09:34:44

6 with gender transition on the

7 following grounds."

8 And then it's -- there's a capital letter A,

9 and it says "Biblical." And there's about seven

10 different entries under -- biblical reasons for 09:35:00

11 opposing medical assistance with gender transition.

12 And -- and my question is, do you agree with

13 this part of this CMDA statement?

14 A Are you asking me to read --

15 MR. FRAMPTON: Objection -- 09:35:16

16 THE WITNESS: -- all of this?

17 MR. FRAMPTON: -- to form and scope.

18 THE WITNESS: Because I can right now.

19 BY MR. BLOCK:

20 Q Yeah, sure. 09:35:22

21 A Okay. Give me some time.

22 I just want to clarify. Are you asking me if

23 I agree with A, B, C, D, E -- and E?

24 Q I asked -- I'm asking you if you agree with

25 A. 09:38:00

1 A Okay. So I've -- I've read through that.

2 Q Okay. And do you agree with it?

3 MR. FRAMPTON: Objection; form and scope.

4 THE WITNESS: There's a lot in there to

5 unpack, so I -- I can't say I agree with all of 09:38:10

6 that. And I was retained as a witness in this case

7 to speak to sports safety. I wasn't retained to

8 provide an opinion in this regard.

9 And again, I had no interaction, really, with

10 CMDA as an organization. 09:38:34

11 BY MR. BLOCK:

12 Q Do you have any religious views about

13 transgender people that will have informed your

14 expert opinion in this case?

15 MR. FRAMPTON: Objection; form and scope. 09:38:57

16 You can answer.

17 THE WITNESS: I would say that my opinions in

18 this case are informed, just like UK Sport, entirely

19 on the science. I don't believe my religious

20 opinions really play into this. I would view my 09:39:19

21 role as providing a scientific opinion.

22 BY MR. BLOCK:

23 Q Okay. Does -- if you recall earlier, we --

24 we just had a discussion about, like, using the --

25 the word "transgender." 09:39:40

1 Do you have any religious beliefs that would
2 preclude you from using the word "transgender"?

3 MR. FRAMPTON: Objection; form and scope.

4 THE WITNESS: No. I just -- I believe that
5 it's best to speak with clarity, and I believe that 09:39:56

6 in many circles of discussion with people who aren't
7 familiar with these types of terms, it gets very

8 confusing to people to keep track of what a

9 transgender woman is or what a transgender man is.

10 I have found that it's easier to refer to biological 09:40:15

11 males and females and then refer to their gender

12 identity.

13 THE REPORTER: I'm so sorry to interrupt.

14 Mr. Frampton, I hear some background noise in your

15 room. I don't know if there's a door you can shut.

16 MR. FRAMPTON: I'm sorry. This is

17 Hal Frampton. It's -- it's -- I'm with the witness,

18 and it's not in our room.

19 THE REPORTER: Okay. Kimberlee, do you know

20 where it's coming from?

21 THE VIDEOGRAPHER: It looked like it was his

22 mic.

23 But could we go off the record real quick?

24 Off the record, is that all right?

25 MR. FRAMPTON: Sure. 09:40:50

1 MR. BLOCK: Yes.

2 THE VIDEOGRAPHER: Off the record at

3 9:41 a.m.

4 (Recess.)

5 THE VIDEOGRAPHER: We are on the record at 09:41:37

6 9:42 a.m.

7 MR. BLOCK: Thanks.

8 BY MR. BLOCK:

9 Q If you go to the -- the last page of this
10 document -- 09:41:51

11 A Sorry, I got to go back.

12 Q Actually, page 14 of the document.

13 A They aren't numbered, so --

14 Q Which --

15 A The last page -- the last page of text. 09:42:06

16 Q This -- no, this should be the -- it's --

17 it's page 14 of the PDF. If you click on the

18 PDF with the --

19 A Oh, I see. Yeah. I -- I'm there.

20 Q Okay. So at the bottom, it says "A final 09:42:27
21 comment on language."

22 Do you see that?

23 A Yes.

24 Q Okay. I'm just going to read this into the
25 record. It says (as read): 09:42:36

1 "Terms should be as descriptively
2 accurate as possible while avoiding
3 ideological programming. For
4 instance, because an individual's
5 intrinsic sex cannot be changed, and 09:42:44
6 gender is essentially a biologically
7 meaningless term or concept aside
8 from biological sex, terms such as
9 'transgender identity,' as if it
10 were an objective reality, should be 09:42:56
11 replaced by 'transgender-identified,
12 -identifying, or -identification,'
13 which are descriptively accurate.
14 Similarly, because 'gender
15 transition' is not ontologically or 09:43:05
16 biologically possible, more
17 descriptively accurate terms, such
18 as, 'attempted transition efforts,'
19 or 'attempted transition-affirming
20 treatments or procedures,' are more 09:43:16
21 accurate and preferred."

22 Did I read that correctly?

23 A You read it correctory -- correctly, yes.

24 Q Okay. Thanks.

25 Do you think that using the term 09:43:24

1 "transgender" amounts to ideological programming?

2 MR. TRYON: Objection.

3 MR. FRAMPTON: Objection; form and scope.

4 THE WITNESS: You cut out. I didn't hear the
5 question. I'm sorry. 09:43:36

6 BY MR. BLOCK:

7 Q Sorry. Sorry.

8 Do you think that the term "transgender" is a
9 form -- is ideological -- I'll rephrase it.

10 Do you think that using the term 09:43:45
11 "transgender" is ideological programming?

12 MR. FRAMPTON: Objection; form and scope.

13 THE WITNESS: Again, I was consulted into
14 this case as a board-certified physician to provide
15 an opinion on sports safety. To the extent that I 09:43:59
16 have an opinion on gender terminology, you know,
17 I've never thought of it in that way, no.

18 BY MR. BLOCK:

19 Q Okay. And do you --

20 A I've never even heard that description. 09:44:13

21 Q Okay. And do you think that -- that
22 transgender identity is not an objective reality?

23 MR. FRAMPTON: Objection; form and scope.

24 THE WITNESS: I don't believe I'm rendering
25 an opinion on that. 09:44:42

1 BY MR. BLOCK:

2 Q And you're not qualified to render an opinion
3 on that; correct?

4 A On whether transgender -- what was the --
5 restate it. 09:44:53

6 Q Transgender identity is an objective reality.

7 MR. FRAMPTON: Objection; form and scope.

8 THE WITNESS: I don't believe I am -- I've
9 been retained to provide an opinion on that
10 statement, no. 09:45:12

11 BY MR. BLOCK:

12 Q Do you have a personal opinion on that
13 statement?

14 MR. FRAMPTON: Objection; form and scope.

15 THE WITNESS: Define what -- what's -- define 09:45:26
16 an objective reality when it comes to gender
17 identification. Can you tell me that?

18 BY MR. BLOCK:

19 Q Well, I'm just referring to the phrasing in
20 this document. So do you not -- do you have an -- 09:45:37

21 A Restate your question one more time.

22 Q Sure. Do you have any personal opinions on
23 whether transgender identity is an objective
24 reality?

25 MR. FRAMPTON: Objection; form and scope. 09:45:47

1 THE WITNESS: I don't know what it means to
2 say that -- I don't know what objective reality with
3 respect to transgender identification even is, so I
4 don't think I can answer that question.

5 BY MR. BLOCK: 09:46:07

6 Q You're not offering any expert opinions in
7 this case on whether gender identity has any
8 biological underpinnings, are you?

9 A No, I'm not. Again, I've been retained in
10 this case as a physician to provide on safety issues 09:46:37
11 with respect to individuals who have transgender
12 identification that are crossing over into other
13 sports.

14 Q So -- so in that sentence, you use the term
15 "individuals who have transgender identification" 09:46:56
16 instead of "transgender individuals," which is
17 similar to what this document says people should use
18 in terms of language. So I'm just trying to explore
19 why you're using the word "transgender
20 identification" instead of "transgender 09:47:10
21 individuals."

22 So why are you using the term "transgender
23 identification" instead of "transgender
24 individuals"?

25 MR. FRAMPTON: Objection; form and scope. 09:47:21

1 THE WITNESS: I -- I don't know that I can
2 speak to that. I mean, it -- it relates, in a
3 sense, to the term "gender identity," does it not?

4 BY MR. BLOCK:

5 Q How so? 09:47:36

6 A Well, transgender identification speaks to
7 identification. Identification is analogous to
8 gender identity. I'm just trying to avoid confusing
9 terms.

10 Q And you think saying "transgender 09:48:03
11 individuals" is a confusing term?

12 A I didn't --

13 MR. FRAMPTON: Objection --

14 THE WITNESS: -- say that.

15 MR. FRAMPTON: -- form and scope. 09:48:07

16 THE WITNESS: You did.

17 BY MR. BLOCK:

18 Q I'm sorry, you and your counsel were talking
19 over each other.

20 Do you think "transgender individuals" is a 09:48:15
21 confusing term?

22 MR. FRAMPTON: Objection; form and scope.

23 Go ahead.

24 THE WITNESS: I -- I didn't say that it's a
25 confusing term. I don't think it's confusing. I 09:48:23

1 don't have a problem using it. I'm just -- I don't
2 know.

3 BY MR. BLOCK:

4 Q So -- so I'll ask, again, an earlier
5 question. Why do you use the phrase "transgender 09:48:40
6 identification" instead of "transgender
7 individuals"?

8 MR. FRAMPTON: Objection; form and scope.

9 THE WITNESS: I can't speak to that. I -- I
10 can't tell you why I chose that term. 09:48:57

11 BY MR. BLOCK:

12 Q Okay. You don't know why?

13 A No.

14 Q Okay. Have you -- have you written anything
15 else on the topic of transgender people? 09:49:13

16 A Written?

17 Q Yes. Besides this white paper and this
18 expert report.

19 A Are you talking about -- define "written" for
20 me. 09:49:34

21 Q Well, I guess I'll go through different types
22 of writing.

23 Have you -- have you written any articles in
24 professional journals about transgender people or
25 the -- touching on the topic of transgender people? 09:49:46

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1 A No.

2 Q Have you written anything in popular media
3 touching on the topic of transgender people?

4 A No.

5 Q Have you given any conference presentations 09:49:57
6 or talks on the topic of -- touching on the topic of
7 transgender people?

8 A No.

9 Q Have you disseminated any written document,
10 in any way, authored by you on the -- touching on 09:50:15
11 the topic of transgender people.

12 MR. FRAMPTON: Object to the form.

13 Go ahead.

14 THE WITNESS: Are you speaking to e-mail?

15 BY MR. BLOCK: 09:50:33

16 Q Sure. Have -- have you written -- have you
17 written e-mails on the -- touching on the topic of
18 transgender people?

19 A Yes.

20 Q Are these e-mails to -- to Listservs? 09:50:42

21 A No.

22 Q Who are these e-mails to?

23 A So in my role as president of AMSSM and on my
24 time on the executive committee, occasionally this
25 issue would -- would crop up, and there were 09:51:07

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1 discussions about it.

2 Q So I'd like, to the best of your ability, for
3 you to recall the specific occasions on which this
4 issue cropped up.

5 Can you remember any of them? 09:51:24

6 A Yep. The first time that I can recall it --
7 let me back up and just say that we have --

8 MR. BLOCK: The witness's video froze for me.

9 THE VIDEOGRAPHER: Yeah, he looks frozen.

10 Let's go off the record. 09:51:54

11 BY MR. BLOCK:

12 Q Sorry, you're -- you froze for -- for that
13 answer, so I think you were just telling me the --
14 the first occasion of the list in which this issue
15 cropped up. 09:52:06

16 A So I said that I was going to back up for a
17 second and just say that our academy hosts several
18 meetings each year, one of which is the annual
19 meeting, and it's usually about five days long, and
20 it's -- it's structured with different symposia that 09:52:20
21 are themed. And periodically, particularly since, I
22 don't know, 2016, maybe, when I was -- I don't --
23 I'd have to think what year I went on to exec, maybe
24 it was 2017, but there had been, once in a while,
25 inquiries by members about whether there would be a 09:52:43

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1 transgender medicine symposium at the annual
2 meeting, because there had never been one before.
3 And so in 2018, as we were -- as my program chair
4 and I were putting together content for the meeting,
5 this issue briefly came up around that. 09:53:03

6 Q Was there a transgender medicine component to
7 that symposium?

8 A That was -- that was for the annual meeting
9 we had in Houston in 2019, and, no, we did not
10 include that. 09:53:29

11 Q Why not?

12 A Well, there were lots of reasons, but we had
13 a budget that we had to work from, and we already
14 had a pretty strong sense of what we were wanting to
15 pay for to bring in other speakers to that meeting, 09:53:49
16 and I felt like if we were going to have a symposium
17 on transgender -- on the transgender athlete, that
18 it ought to be something that was structured with a
19 point/counterpoint format and that we would probably
20 want to bring in outside academicians to help create 09:54:12
21 that dialogue.

22 Q Do most of -- do other components of the
23 symposia have point/counterpoint formats to them?

24 A Often, yes.

25 Q What are some examples of -- of other 09:54:40

1 portions of the symposia that have had point and
2 counterpoint formats?

3 A There's many examples, but one would be youth
4 sport specialization versus having your child play
5 in multiple different sports, point or counterpoint. 09:54:57

6 Q So you said there were several reasons why
7 you didn't include a transgender medicine component
8 of the symposium. What are some others?

9 A As I said, we were -- we already had a sense
10 of what we wanted included in that meeting, and 09:55:22
11 there's always topics that need to be left for
12 future meetings, and that was --

13 Q Was -- sorry. Did you have a transgender
14 medicine component of a future meeting?

15 A We haven't had an insight future meeting 09:55:38
16 since that Houston meeting because of COVID, so --
17 the 2020 meeting and the 2021 meeting were canceled.

18 Well, actually, I want to clarify.

19 The 2021 meeting was done virtually, and
20 there was a transgender component to that meeting, 09:55:55
21 yes.

22 Q What was the transgender component?

23 A I can't speak to it. I -- I wasn't part of
24 it.

25 Q What do you mean you weren't part of it? 09:56:10

1 A I mean I didn't have anything to do with
2 organizing it.

3 Q Did you attend it?

4 A No.

5 Q Why not? 09:56:23

6 A Because the meeting was virtual, and I was
7 down in Florida with my family at the time, and we
8 were, I believe, at a park that day.

9 Q Which one?

10 A Which park? 09:56:38

11 Q Yeah.

12 A I don't remember which park we were at that
13 day, but it was -- it was either Hollywood Studios
14 or EPCOT or Magic Kingdom. I don't know.

15 Q Is there a way to watch the transgender 09:56:52
16 component of the virtual symposium after the fact?

17 A I believe for a time there is. I don't know
18 if I -- I don't know if it's still accessible,
19 but...

20 Q Do you know who the speakers were at that 09:57:11
21 symposium -- at that transgender component of the
22 symposium?

23 A No, I don't recall.

24 Q Do you recall the topic?

25 A You mean the specific topics within sports 09:57:21

1 and transgenderism?

2 Q Yeah. At that symposium.

3 A No.

4 Q Now, by the time this symposium -- this
5 portion of the symposium occurred -- well, actually, 09:57:45
6 let me step back.

7 Around when did this 2021 virtual symposium
8 occur?

9 A In April of 2021.

10 Q In that -- by the time it occurred, had you 09:58:03
11 already been retained by ADF?

12 A Yes.

13 Q So did you think that the content of the
14 symposium might relate to any of the topics on which
15 you would be opining for ADF? 09:58:21

16 MR. FRAMPTON: Object to the form.

17 Go ahead.

18 THE WITNESS: I can't speak to that. I was
19 already well into my work on the paper.

20 BY MR. BLOCK: 09:58:40

21 Q Did you think that the contents of the
22 symposium might be helpful in providing you
23 additional relevant information for you paper?

24 MR. FRAMPTON: Same objection.

25 THE WITNESS: I -- I feel like the process 09:58:54

1 that we went through to create that paper, that I
2 went through to create that paper, was thorough, and
3 I'm confident that we canvassed most of the
4 available literature on the subject prior to the
5 date of the paper being submitted. 09:59:19

6 BY MR. BLOCK:

7 Q You said "we canvassed."

8 Who do you -- who do you mean by "we"?

9 MR. FRAMPTON: Object to the form.

10 THE WITNESS: I mean Alliance Defending 09:59:37
11 Freedom and myself.

12 BY MR. BLOCK:

13 Q Did Alliance Defending Freedom help provide
14 you with papers to review?

15 MR. FRAMPTON: Objection to the form. 09:59:44

16 THE WITNESS: When we first sat down to flesh
17 through what this paper might look like, I met with
18 one of the attorneys from Alliance Defending
19 Freedom, I outlined with him what we thought might
20 be an appropriate take on this paper, and then both 10:00:06
21 of us did literature searches. I compiled what I
22 thought was relevant for the paper.

23 The paper is entirely mine.

24 BY MR. BLOCK:

25 Q What do you mean by that? 10:00:38

1 A That every line in that paper is my own words
2 and thought.

3 Q Is every line of the February 23rd, 2022,
4 paper also your own words and thought?

5 A I've reviewed every line in -- in both 10:00:53
6 papers, made extensive edits through it, and it
7 represents my own thought completely, yes.

8 Q All right. Well, first you said every line
9 was your own words and thought, and then you said it
10 represents your thoughts completely, and so I just 10:01:15
11 want to get clarity.

12 Is every line of the February 23rd paper your
13 own words and thought?

14 MR. TRYON: I'm just going to object and make
15 sure the witness understands that any communications 10:01:26
16 between him and either this office or ADF is covered
17 by the attorney-client privilege.

18 MR. FRAMPTON: Yes, same -- same objection.

19 So we're not to discuss the substance of
20 those communications. 10:01:42

21 Go ahead.

22 THE WITNESS: Can you repeat the question?

23 BY MR. BLOCK:

24 Q Yeah. Is every line of the February 23rd,
25 2022, paper your own words and thought? 10:01:52

1 MR. FRAMPTON: Same objection.

2 Go ahead.

3 THE WITNESS: The additions that were made to
4 that paper are my additions, yes.

5 BY MR. BLOCK: 10:02:18

6 Q When did you first become interested on the
7 topic of transgender women competing in women's
8 sports?

9 A I -- I would say that I first became aware of
10 it around the time that Joanna Harper had released 10:02:36
11 her paper.

12 Q Which paper by Joanna Harper are you
13 referring to?

14 A The -- the one where she published race times
15 of transgender athletes that transitioned and -- and 10:03:03
16 was comparing them to both their biological
17 competitors and then -- and then their
18 transgender -- was comparing race times and how they
19 stratified both and after transition.

20 Q So this is her first paper? 10:03:30

21 A I -- yes. It was the first paper she
22 published, yes.

23 Q And when did you read that paper first?

24 A I couldn't tell you. Years ago.

25 Q So you read it close to the time that it 10:03:42

1 first came out?

2 A I don't know if I -- I don't recall if I read
3 it or if I was reading reference to it, but it would
4 have been around that time.

5 Q What other reading on the topic of 10:03:54
6 transgender women competing in women's sports had
7 you done before you were first contacted by Alliance
8 Defending Freedom?

9 A I don't know if it's -- it's not specific to
10 transgenderism and sport, but McHugh's paper in the 10:04:24
11 New Atlantis had come up around the issue, again,
12 when I was at AMSSM, so that -- that had led to
13 discussions about transgenderism.

14 Q It led to discussions at ASSM (sic)?

15 A Yeah, just with other -- other people there. 10:04:46

16 Q And what were those discussions?

17 A It -- well, the -- the paper had to do with
18 the biological underpinnings of -- of gender
19 identity.

20 Q How -- 10:05:01

21 A But --

22 Q How did -- I didn't mean to cut you off. Go
23 on.

24 A So to your point, it's not directly related
25 to transgenderism and sport. 10:05:10

1 Q So in what context did it arise for
2 discussion at AMSSM, then?

3 A There was discussion about a paper in a
4 non-published newsletter on transgenderism in
5 sports, and there was discussion about the way that 10:06:00
6 that paper was being presented and whether it was
7 contextually sound.

8 Q So the paper was sent in a newsletter?

9 A The paper was submitted for publication in a
10 newsletter. 10:06:27

11 Q In what newsletter?

12 A It's called The Sideline Report.

13 Q And who publishes The Sideline Report?

14 A The American Medical Society for Sports
15 Medicine. 10:06:37

16 Q And -- and who presented the paper for -- for
17 submission?

18 A I don't recall his name.

19 Q Do you remember what the paper said,
20 generally? 10:06:48

21 A It was -- it was a -- again, I -- it's been
22 years since I've read that paper, but my
23 recollection of it is that it was somewhat skewed in
24 terms of its ideology.

25 Q Skewed -- 10:07:13

1 A That it was -- it -- that it was not a
2 balanced discussion of the pros and cons of
3 transgender participation in sport.

4 Q So in which direction was it skewed?

5 A It was skewed towards more affirmative 10:07:32
6 participation.

7 Q And so who -- who reviews the submissions to
8 The Sideline Report?

9 A At the time, people on the executive
10 committee. It was shared with them. 10:07:50

11 Q And were you on the executive committee at
12 that time?

13 A Yes.

14 Q And who raised concerns that it was not a
15 balanced discussion? 10:08:08

16 MR. FRAMPTON: Objection to the form.

17 Go ahead.

18 THE WITNESS: As I recall, I and some others
19 on the committee raised concerns.

20 BY MR. BLOCK: 10:08:24

21 Q Did you say you and some others on the
22 committee?

23 A Correct.

24 Q And who is the person that brought the McHugh
25 article to folks' attention? 10:08:37

1 A I did.

2 MR. FRAMPTON: Same objection.

3 BY MR. BLOCK:

4 Q Go ahead.

5 A I did. 10:08:41

6 Q So had you already read the McHugh article
7 before -- before this incident arose?

8 A Well, I hadn't read the entire article,
9 because it's extremely long, but going back to what
10 we were talking about earlier, trying to decide what 10:09:01

11 a transgender symposium what point and counterpoint
12 might look like, one of the considerations at the
13 time was whether to bring one of those authors to,
14 you know, what would be the 2019 meeting to provide
15 input against -- to provide input in -- in context 10:09:27
16 of that issue.

17 Q So around when was this discussion about
18 The Sideline Report article? What time?

19 MR. FRAMPTON: Objection to the form.

20 Go ahead. 10:09:46

21 THE WITNESS: I believe it would have been
22 sometime in early 2020.

23 BY MR. BLOCK:

24 Q All right. So -- so I have --

25 A I don't recall that -- I -- I don't want to 10:10:01

1 say that. I don't recall that offhand. I'd have to
2 go back and look.

3 Q Okay. So I want to make sure I just have a
4 complete list of incidents in which this came --
5 this topic related to transgender people came up for 10:10:06
6 discussion.

7 So I have, from you, this discussion about
8 the submission to The Sideline Report. I have, from
9 you, this discussion in 2018 about whether or not to
10 have a transgender medicine component to the 10:10:27
11 upcoming symposium.

12 Are there any other times in which topics
13 related to transgender people came up at ASSM -- or
14 AMSSM?

15 MR. FRAMPTON: Objection to the form. 10:10:41

16 Go ahead.

17 THE WITNESS: I can't recall that issue
18 coming up in others, no.

19 BY MR. BLOCK:

20 Q And so how did you become aware of McHugh's 10:10:57
21 paper?

22 A It was all over the news at the time that it
23 came out.

24 Q Where in the news?

25 MR. FRAMPTON: Objection to the form. 10:11:20

1 Go ahead.

2 THE WITNESS: I can't tell you that. I get
3 my news from lots of sources, so I can't tell you
4 where I first heard of it.

5 BY MR. BLOCK: 10:11:27

6 Q Do you get your news from Ben Shapiro at all?

7 A No.

8 Q Do you view Ben Shapiro to be a reliable
9 source of information?

10 MR. FRAMPTON: Objection to the form. 10:11:37

11 Go ahead.

12 THE WITNESS: I was not retained to provide
13 an opinion there, but -- again, I was retained to
14 provide an opinion as to the sports safety
15 implications for transgender athletes crossing over 10:11:51
16 into cisgender sporting events.

17 But to your point -- what -- what was your
18 question?

19 BY MR. BLOCK:

20 Q Would -- would you view Ben Shapiro to be a 10:12:08
21 reliable source of information on these matters?

22 A I have no --

23 MR. FRAMPTON: Objection --

24 THE WITNESS: -- opinion on that.

25 MR. FRAMPTON: -- to the form. 10:12:16

1 BY MR. BLOCK:

2 Q I'm -- I'm sorry, can you -- can you say it
3 again? Counsel and you were cross talking.

4 So I'll ask it again and wait for your
5 counsel to object, and then you can answer, okay? 10:12:24

6 Do you view Ben Shapiro to be a reliable
7 source of information on medical topics concerning
8 transgender people?

9 MR. FRAMPTON: Objection to the form and
10 scope. 10:12:35

11 Go ahead.

12 THE WITNESS: I have no opinion on that.

13 BY MR. BLOCK:

14 Q Well, you don't have any -- I -- I need an
15 answer to the -- to the question. So if you can 10:12:44
16 answer to the best of your ability --

17 A I don't know enough about Ben Shapiro's
18 opinions to be able to state one way or the other
19 what I think of them.

20 Q Okay. Do you know who Ben Shapiro is? 10:12:58

21 A Yes, I've heard of him.

22 Q Okay. Do you -- do you listen to him or --
23 or watch his shows?

24 A No.

25 Q Would you ever rely on Ben Shapiro in 10:13:13

1 providing an expert opinion?

2 MR. FRAMPTON: Objection to the form and
3 scope.

4 THE WITNESS: Are you asking if I would rely
5 on Ben Shapiro to provide an expert medical opinion? 10:13:20

6 BY MR. BLOCK:

7 Q Yes.

8 A Of course not.

9 Q So at the time that you first talked with ADF
10 about, you know, what a white paper would look like, 10:13:40
11 had you already formed an opinion on the issue?

12 MR. FRAMPTON: Objection; form and scope.

13 Go ahead.

14 THE WITNESS: So, you know, I -- I've been
15 practicing sports medicine for 20-plus years now, 10:13:53
16 and I have lots of experience taking care of injured
17 athletes. And so understanding that there was
18 perhaps the possibility of larger individuals
19 crossing over into sports where there were smaller
20 individuals and, you know, participating in contact 10:14:19
21 sports, I had concerns, but I hadn't really fully
22 fleshed out an opinion, no. I believed that I went
23 into the process of data review with open eyes.

24 Q What does that mean, you went into the
25 process of data review with open eyes? 10:14:41

1 your ultimate answer was that it would be safe or
2 unsafe for transgender women to participate.

3 A No, the --

4 MR. FRAMPTON: Objection.

5 I'm sorry, let me do my objection. 10:16:31

6 Objection.

7 Answer his question.

8 THE WITNESS: No, to the best of my
9 knowledge, my compensation was not tied to the
10 determination of literature review around this 10:16:39
11 subject.

12 BY MR. BLOCK:

13 Q So when you did a literature review, are you
14 confident that you searched for everything that
15 would support or oppose the position you're 10:17:00
16 advocating for in your report?

17 MR. FRAMPTON: Objection; form and scope.

18 THE WITNESS: I'm confident that available
19 literature, pro and con, was accessed and reviewed.

20 BY MR. BLOCK: 10:17:18

21 Q And are you confident that your report
22 adequately discusses the available literature, pro
23 and con?

24 A Again --

25 MR. FRAMPTON: Objection; form and scope. 10:17:29

1 Go ahead.

2 THE WITNESS: -- the -- the white paper is
3 not a comprehensive literature review on the
4 subject. It is an assessment of how the literature
5 speaks to the issue of sports safety, particularly. 10:17:38
6 I included what I thought was relevant to that
7 discussion.

8 BY MR. BLOCK:

9 Q So -- but in -- in your -- in deciding what
10 to include in your white paper, understanding that 10:17:55
11 you can find it specifically to the topic of safety,
12 did you include in the white paper everything
13 that -- you know, pro and con to your argument, or
14 did you just quote things that -- that you thought
15 supported your contention that it would be unsafe 10:18:17
16 for transgender women to participate?

17 MR. FRAMPTON: Objection; form, scope.

18 THE WITNESS: Well, obviously I can't speak
19 to how successful I was at -- while the final
20 reflects that, but I believe that it was fair 10:18:40
21 consideration given to what ought to go into that
22 paper and that the appropriate relevant things that
23 needed to be in there were in there.

24 BY MR. BLOCK:

25 Q Did you view the purpose of the white paper 10:18:58

1 to provide an overview of -- overview of both sides
2 of the argument, or did you view the purpose of the
3 white paper to be, you know, making a specific
4 argument that it was unsafe and -- and just
5 providing, you know, citations to materials that 10:19:17
6 supported that argument?

7 MR. FRAMPTON: Objection; form and scope.
8 Go ahead.

9 THE WITNESS: I wouldn't say that the point
10 of the argument was to argue -- or the paper was to 10:19:27
11 argue that it was unsafe. It was to -- it was to
12 lay out the evidence that says whether it was safe
13 or not and what -- and lay out the thought process
14 that would go into making that determination.

15 BY MR. BLOCK: 10:19:56

16 Q If you could go to --

17 A I think the underpinning of the whole thing
18 is my background as a physician and just the thought
19 processes that go into the practice of medicine on a
20 daily basis when you're looking at injury risk and 10:20:19
21 what -- what sorts of things factor into that. So
22 that -- that underpins the paper before we even
23 start.

24 Q And before starting on the paper, did you
25 have any experience in working with sports injuries 10:20:31

1 related to the participation of transgender people?

2 MR. FRAMPTON: Objection; form and scope.

3 Go ahead.

4 THE WITNESS: Possibly. I -- I see men and
5 women, boys and girls, every day in the office. I 10:20:53
6 don't make a habit of asking them what their gender
7 identity is. I take care of them all as well as I
8 possibly can.

9 BY MR. BLOCK:

10 Q To the best of your knowledge, did you ever 10:21:03
11 treat a sports injury for a transgender patient?

12 A Again, I don't make a habit of asking that
13 question of my patients. So whether I've seen a
14 transgender individual or not, I couldn't speak to
15 that. 10:21:22

16 Q So you -- you have no idea one way or another
17 whether you've treated a transgender patient?

18 MR. TRYON: Objection.

19 MR. FRAMPTON: Same objection; form and
20 scope. 10:21:30

21 Go ahead.

22 THE WITNESS: I -- I may have seen and
23 treated one or I -- I may not have. I don't ask
24 that question of people. And I see men and women,
25 boys and girls, in the office every day. 10:21:38

1 BY MR. BLOCK:

2 Q Well, so, I guess, if a -- if a
3 transgender -- if you saw a transgender patient, you
4 wouldn't be able to tell from their physiology what
5 their -- what their, as you say, biological sex is? 10:22:00

6 MR. TRYON: Objection.

7 MR. FRAMPTON: Objection; form.

8 Go ahead.

9 THE WITNESS: What do you mean by
10 physiological form? 10:22:13

11 BY MR. BLOCK:

12 Q Let's say your -- a transgender -- let's say
13 a woman comes into your office with a -- you know, a
14 knee injury. Would -- by inspecting their knee,
15 would you be able to tell whether or not this was a 10:22:36
16 cisgender woman or a transgender woman?

17 MR. FRAMPTON: Objection; form and scope.

18 Go ahead.

19 THE WITNESS: Not necessarily, no.

20 BY MR. BLOCK: 10:22:44

21 Q Why not?

22 A A knee doesn't have sex-identifying
23 characteristics to it.

24 Q You wouldn't be able to tell from muscle mass
25 on the -- the patient's, you know, legs whether or 10:23:00

1 not that patient was a transgender woman or a
2 cisgender woman?

3 MR. FRAMPTON: Objection; form.

4 THE WITNESS: I'm not sure where you're going
5 with this. I'm not sure I understand the question. 10:23:17

6 BY MR. BLOCK:

7 Q Well -- well -- well, these -- so you've
8 talked, in your paper, about physiological
9 differences between people with male sex assigned at
10 birth and female sex assigned at birth and about, 10:23:35
11 you know, how -- you know, how stark those
12 differences are and that they're not affected by
13 hormone therapy, and so I guess my question is, in
14 light of that, I find it a little surprising that --
15 that you would then say that you could examine or 10:23:49
16 treat a sports injury and not know whether the
17 person you're treating had a female sex assigned at
18 birth or a male sex assigned at birth. So that's
19 the context for my question.

20 A Well, I think the -- the initial -- 10:24:05

21 MR. FRAMPTON: Hold on.

22 Objection to the form.

23 MR. TRYON: Objection.

24 MR. FRAMPTON: Go ahead.

25 THE WITNESS: The initial question was 10:24:10

1 whether I had ever treated transgender individuals,
2 and what I told you was that I try to view my
3 patients as the individual in front of me. I don't
4 routinely ask them what their gender identity is.

5 If you're asking me if anecdotally I could 10:24:26
6 identify a, to use your language, trans woman if I
7 was doing a knee exam, I suppose I could, but I
8 can't speak to that, and it's far afield of why I
9 was retained in this case.

10 BY MR. BLOCK: 10:24:47

11 Q So -- but to the best of your knowledge, you
12 don't know one way or another whether or not you've
13 ever treated a transgender patient?

14 MR. FRAMPTON: Objection; form.

15 Go ahead. 10:24:56

16 THE WITNESS: To the best of my knowledge, I
17 don't know whether I've treated a transgender
18 patient, no.

19 BY MR. BLOCK:

20 Q Did you have any interactions with ADF before 10:25:03
21 you were first contacted as potentially being
22 retained as an expert?

23 A No.

24 Q Have you provided any testimony in support of
25 any legislation related to transgender people? 10:25:16

1 A No.

2 Q Have you provided any testimony in support of
3 legislation similar to the legislation challenged in
4 this case?

5 A What are you asking? 10:25:39

6 Q Well, yeah, I -- I -- I'm just trying to make
7 sure I cover all the bases of my question.

8 And so I've -- I've -- it has been argued in
9 this case that the statute at issue here, H.B. 3293,
10 is not about transgender people, and so I -- I 10:26:10
11 didn't want you to answer my question based on a
12 similar type of distinction.

13 So -- so my question is, did you ever testify
14 in support of any legislation that would have the
15 affect of precluding transgender people from 10:26:25
16 participating on sports teams consistent with their
17 sex assigned -- with their gender identity?

18 MR. FRAMPTON: Objection to the form.

19 Go ahead.

20 THE WITNESS: I don't believe that I have 10:26:38
21 ever provided testimony to any legislative
22 committee, pending -- or pending legislation around
23 issues similar to what we're talking about today.

24 BY MR. BLOCK:

25 Q Thank you. 10:26:59

1 MR. BLOCK: I -- I'm okay continuing, but do
2 you need a break?

3 MR. FRAMPTON: We're at about an hour and a
4 half. It's -- it's up to you, if you want five
5 minutes or if you want to go for another half hour 10:27:13
6 or whatever.

7 THE WITNESS: Is this a good break point for
8 you, or do you --

9 MR. BLOCK: Either way. I can break in half
10 an hour or I can keep going. 10:27:24

11 THE WITNESS: I can use the restroom.

12 MR. BLOCK: Okay. So --

13 MR. FRAMPTON: Then let's do five minutes.

14 MR. BLOCK: Great. See you in five.

15 MR. FRAMPTON: All right. Thank -- 10:27:33

16 THE VIDEOGRAPHER: We're off -- off the
17 record at 10:27 a.m.

18 (Recess.)

19 THE VIDEOGRAPHER: We are on the record at
20 10:34 a.m. 10:34:34

21 BY MR. BLOCK:

22 Q Good morning again. I just have some
23 questions about your -- your training as related to
24 transgender people.

25 To the best of your recollection, as part of 10:34:49

1 your formal education for your undergraduate degree,
2 did you ever take any courses regarding transgender
3 people?

4 MR. FRAMPTON: Objection; form.

5 Go ahead.

10:35:03

6 THE WITNESS: To the best of my recollection,
7 I never took a course in trans- -- affecting -- or
8 reflecting transgender people in undergraduate, no.

9 BY MR. BLOCK:

10 Q And did you ever conduct any research

10:35:12

11 concerning transgender people as an undergrad?

12 MR. FRAMPTON: Object to the form.

13 Go ahead.

14 THE WITNESS: No, I never conducted research
15 as an undergraduate on transgender people.

10:35:25

16 BY MR. BLOCK:

17 Q And then as part of your formal education for
18 your M.D., did you ever take any courses regarding
19 transgender people?

20 MR. FRAMPTON: Object to the form.

10:35:37

21 THE WITNESS: No. There were no courses on
22 transgender people offered during my training in
23 medical school.

24 BY MR. BLOCK:

25 Q And did you -- did you ever conduct any

10:35:45

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1 research concerning transgender people in medical
2 school?

3 MR. FRAMPTON: Object to the form.

4 THE WITNESS: No, I never conducted research
5 on transgender people in medical school. 10:35:51

6 BY MR. BLOCK:

7 Q Okay. And in -- in your residency, did you
8 receive any training related to transgender people?

9 MR. FRAMPTON: Object to the form.

10 Go ahead. 10:36:04

11 THE WITNESS: I can't recall offhand if there
12 were lectures on that subject during the time that I
13 was there.

14 To the best of my recollection, the answer to
15 that is no. 10:36:18

16 BY MR. BLOCK:

17 Q And in your fellowship, did you receive any
18 training related to transgender people?

19 MR. FRAMPTON: Same objection.

20 THE WITNESS: Again, to the best of my 10:36:30
21 recollection, I do not recall specific training on
22 the transgender athlete during my fellowship.

23 BY MR. BLOCK:

24 Q So you're not -- you're not an expert in the
25 treatment of transgender people; correct? 10:36:47

1 MR. FRAMPTON: Object to the form, scope.

2 Go ahead.

3 THE WITNESS: As I said, I'm a

4 board-certified sports medicine physician. I've

5 been retained in this case to offer an opinion on 10:36:58

6 sports safety. I'm not a board-certified

7 endocrinologist.

8 BY MR. BLOCK:

9 Q Okay. So I -- I just asked -- I need to

10 define the scope of the opinions you're offering. 10:37:08

11 So you're not -- you -- you are not an expert

12 in the treatment of transgender people; correct?

13 MR. FRAMPTON: Object to the form.

14 THE WITNESS: I do not treat transgender --

15 I -- I do not have training in the treatment of 10:37:22

16 transgender people. I am not a board-certified

17 endocrinologist.

18 BY MR. BLOCK:

19 Q And -- and you are not an expert in the

20 treatment of transgender people; correct? 10:37:31

21 A Define --

22 MR. FRAMPTON: Sam objection.

23 THE WITNESS: Define "treatment" for me.

24 BY MR. BLOCK:

25 Q Medical care for transgender people. 10:37:47

1 MR. FRAMPTON: Same objection to the form.

2 Go ahead.

3 THE WITNESS: I would be considered an expert

4 for the sports medicine care of an injured athlete

5 who happens to be transgender.

10:38:03

6 BY MR. BLOCK:

7 Q Okay. So --

8 A I'm not an -- I am not a board-certified

9 endocrinologist. So if your speaking to hormonal

10 manipulation, then no.

10:38:12

11 Q And you're not -- you're not an expert in

12 mental healthcare for transgender people; correct?

13 MR. FRAMPTON: Object to the form.

14 Go ahead.

15 THE WITNESS: Well, in the context of the

10:38:24

16 work that we do with patients every day, we have to

17 take into consideration mental health, so it touches

18 on what I do every day.

19 BY MR. BLOCK:

20 Q How so?

10:38:46

21 A The -- I treat the person in front of me and

22 whatever they're bringing into the room.

23 Q So you're -- you're not an expert in the

24 treatment of gender dysphoria, in particular, are

25 you?

10:39:07

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1 A Define "gender dysphoria."

2 Q It's the medical condition recognized in the
3 DSM-V.

4 Do you -- do you know what the DSM-V is?

5 A I'm familiar with it, yes. 10:39:21

6 Q Okay. So are -- are -- are you a -- an
7 expert in mental healthcare for treating the
8 condition of gender dysphoria as defined in the
9 DSM-V?

10 A I am a board-certified sports physician who 10:39:34
11 has been retained to provide information on safety
12 in athletes, some of whom may be transgender.

13 Q Okay. But you are not -- you have not been
14 retained to provide an expert opinion on the
15 treatment of gender dysphoria; correct? 10:39:53

16 A Correct.

17 Q Okay. If we go down to -- if you would look
18 at Exhibit 80, please. That's your expert report.

19 A Exhibit 80, you said?

20 Q Yeah. 10:40:36

21 A Okay.

22 Q And if you go to your abbreviated CV, which
23 is, you know, the last three pages.

24 A Okay.

25 Q And if you go to -- it's the paginated page 10:40:55

1 73 at the bottom. There's a section of your CV that
2 says "Special Qualifications."

3 Do you see that?

4 A I do.

5 Q Okay. I just have a couple of questions 10:41:06
6 about -- about this.

7 The -- the first entry under "Special
8 Qualifications" is "Prior legal consulting work in
9 cases with both local and national reach."

10 Do you see that? 10:41:21

11 A Yes.

12 Q Okay. What are the cases with national reach
13 that you're referring to?

14 A This one.

15 Q Any others? 10:41:48

16 A The -- as I said, I've been retained in the
17 Florida case.

18 Q Okay. So further down, it says -- this is
19 about, like, the seventh bullet point -- it says (as
20 read): 10:41:56

21 "Extensive experience speaking to
22 large national groups on issues
23 pertaining to sports medicine,
24 including but not limited to:"

25 And then there's a list of things. 10:42:06

1 Do you -- do any of the topics you've spoken
2 on include anything about transgender people?

3 A No, I have never --

4 MR. FRAMPTON: Objection to form.

5 Go ahead.

10:42:21

6 THE WITNESS: In my role as a sports
7 physician, I have not spoken on the topic of
8 transgenderism in sports.

9 BY MR. BLOCK:

10 Q In -- in any other role, have you spoken on
11 the topic of transgendered people in sports?

10:42:28

12 A No.

13 Q Now, the -- the second to last sub-bullet
14 point of the things you've spoken of says "Advocacy
15 in Sports Medicine."

10:42:44

16 Do you see that?

17 A Yes, I do.

18 Q When you give speeches on the topic of
19 advocacy in sports medicine, what do you talk about?

20 A So prior to being on executive, I was -- I
21 served two terms on the AMSSM's board of directors,
22 and I became noted as somebody who was involved in
23 public policy. And I guess I'd define that by
24 advocating for sports medicine issues in the -- in
25 the public sphere.

10:42:55

10:43:22

1 So during the time that I was on executive,
2 we interviewed and hired our first lobbyist. We
3 developed a state by state network of physician
4 members who would inform us of legislative issues
5 going on around the United States. We were involved 10:43:43
6 in some creation of legislation. That's -- that's
7 the sort of advocacy that I'm talking about.

8 So -- so the advocacy would be teaching other
9 physicians how to advocate for sports medicine
10 issues in the legislative arena. 10:44:08

11 Q So what's an example of advocating for sports
12 medicine issues?

13 A I helped Tom Latham write a bill that
14 would -- that clarified legal questions about
15 physicians who took care of teams across state lines 10:44:37
16 and didn't have licensure in the state that they
17 were traveling into, and that bill passed the
18 U.S. Congress and was signed by President Trump.

19 Q Does AMSSM have any official position on the
20 participation of transgender athletes in sports? 10:45:04

21 A I don't believe they do.

22 Q Does AMSSM issue official positions on -- on
23 topics?

24 A Occasionally, yes.

25 Q Do you know whether AMSSM ever had any 10:45:25

1 discussions or debates about whether to form an
2 official position on the topic of transgender
3 athletes participating in sports?

4 A To the best of my recollection, not that
5 specifically, no. 10:45:40

6 Q Anything -- to the best of your knowledge,
7 has AMSSM taken -- had any discussions about taking
8 an official position in any other topic related to
9 transgender people?

10 MR. FRAMPTON: Objection to the form. 10:45:57

11 Go ahead.

12 THE WITNESS: There was a position statement
13 several years ago on mental health issues in
14 athletes, and I can't recall offhand whether the
15 transgender athlete was referenced to in that paper, 10:46:14
16 but I think it was, possibly. I'm not sure.

17 BY MR. BLOCK:

18 Q And were you involved in those discussions at
19 all?

20 A No. I was on executive at the time, so 10:46:27
21 drafts of those always came across for us to review,
22 but I don't recall the specifics of that paper.

23 Q Going back to the -- the 2021 AMSSM
24 conference, why is it that you didn't have any
25 involvement in planning for the sessions related to 10:46:56

1 transgender medicine?

2 MR. FRAMPTON: Objection to the form.

3 Go ahead.

4 THE WITNESS: Because the -- the format on
5 executive is that you're elected to a four-year 10:47:12

6 term. And your first year, you're the second vice
7 president. Your second year, you're the first vice
8 president. Your third year, you're the president.

9 The fourth year, you're the immediate past
10 president. All four years, you're a voting member 10:47:25
11 of executive. The second vice president is
12 responsible for planning an upcoming annual meeting.

13 So those conversations that I was telling you
14 about occurred at the time that I was second vice
15 president and working on formulating what would be 10:47:46
16 the Houston meeting.

17 BY MR. BLOCK:

18 Q And so other -- so you didn't have
19 discussions about the meetings other than that year
20 when you were the second vice president, is that 10:48:05
21 what you said?

22 MR. FRAMPTON: Objection to form.

23 THE WITNESS: My responsibility was for the
24 2019 annual meeting.

25 ///

1 BY MR. BLOCK:

2 Q Okay. And so you weren't involved in
3 discussions for planning for the 2021 meeting?

4 MR. FRAMPTON: Same objection.

5 Go ahead. 10:48:23

6 THE WITNESS: No, I was not.

7 BY MR. BLOCK:

8 Q Okay. So the 2021 -- actually, let me just
9 introduce another exhibit. Actually, I'll do it
10 later. 10:49:00

11 Let's go to your -- Exhibit 81, which is your
12 June 22nd, 2021, report and white paper.

13 A Did you say 81?

14 Q Yes. It's the document that says "Exhibit G"
15 at the top, and then it is your declaration from 10:49:23
16 June 22nd, 2021.

17 A Okay.

18 Q Do you have that in front of you?

19 A I do.

20 Q Okay. So in this June 2021 white paper, do 10:49:33
21 you express any opinions about whether prepubertal
22 boys have an athletic advantage over prepubertal
23 girls?

24 A I don't want to overstate. I can't recall
25 offhand, but I -- I don't think the focus of that 10:49:49

1 paper included prepubertal girls or boys.

2 Q Were they discussed at all?

3 A I can't recall.

4 Q If you can turn to, you know, page 7, just
5 referring to the -- the document's pagination, not 10:50:11
6 the -- not the PDF pagination, in -- in -- at the
7 very top of page 7. Let me know when you get there.

8 A Okay. I'm there.

9 Q Okay. So there's sub -- subparagraph D.
10 Do you see that? 10:50:32

11 A Yes.

12 Q Okay. Subparagraph D says (as read):

13 "Current research supports the
14 conclusion that suppression of
15 testosterone levels by males who 10:50:40
16 have already begun puberty will not
17 fully reverse the effects of
18 testosterone on skeletal size,
19 strength, or muscle hypertrophy,
20 leading to persistence of sex-based 10:50:53
21 differences in power, speed, and
22 force generating capacity."

23 Did I read that right?

24 A It's "hypertrophy," but yes.

25 Q All right. Good. My second question would 10:51:02

1 be did I pronounce that word right.

2 A Close.

3 Q "Hypertrophy"?

4 A "Hypertrophy."

5 Q Okay. Does that -- in this paragraph, do you 10:51:11
6 say anything about athletes before puberty?

7 A That paragraph references males who have
8 already begun puberty.

9 Q And there's no reference there to males
10 before puberty, is there? 10:51:32

11 A No.

12 Q Okay.

13 A There is not.

14 Q And now if we go to paragraph -- if we go to
15 page 18 -- I'm sorry -- paragraph 18, page 11, of 10:51:48
16 the same document.

17 A Same pagination?

18 Q Yeah. So -- yeah. So paragraph 18. That's
19 the paragraph that begins with "External risk
20 factors." 10:52:08

21 A Yes, I see.

22 Q And if you go five lines from the bottom,
23 there's a sentence that begins with "To the latter
24 point."

25 A Uh-huh. 10:52:16

1 Q Okay. It says (as read):

2 "To the latter point, children don't
3 play contact sports with adults and,
4 as has already been discussed, after
5 the onset of puberty, men and women
6 compete in categories specific to
7 their own biological sex."

10:52:24

8 Do you see that?

9 A Yes, I do.

10 Q And I've read that correctly?

10:52:32

11 A You did.

12 Q Okay. And so this sentence also refers to
13 men and women competing in -- I'll say this again.

14 You don't discuss anything about people
15 before puberty in this sentence, do you?

10:52:49

16 MR. FRAMPTON: Objection to the form.

17 Go ahead.

18 THE WITNESS: No, I don't.

19 BY MR. BLOCK:

20 Q Okay. Why did you say "after the onset of
21 puberty, men and women compete in categories
22 specific to their own biological sex"?

10:52:57

23 A Well, that was probably overstated. It --
24 those categories clearly exist prior to puberty as
25 well.

10:53:23

1 Q Why -- why did you include the words "after
2 the onset of puberty"?

3 MR. FRAMPTON: Objection to the form.

4 Go ahead.

5 THE WITNESS: I believe because the divisions 10:53:30
6 are consistent -- are most consistent after puberty.

7 BY MR. BLOCK:

8 Q And every line of this paper is your own
9 words and thought, right?

10 A Correct. 10:53:57

11 Q Okay. And so you thought it was relevant to
12 include the words "after the onset of puberty" in
13 this sentence; correct?

14 MR. FRAMPTON: Objection; form.

15 Go ahead. 10:54:07

16 THE WITNESS: Yes. For example,
17 six-year-olds will often play soccer together, boys
18 and girls.

19 BY MR. BLOCK:

20 Q And do you think that that is a threat to the 10:54:21
21 safety of the girls?

22 MR. FRAMPTON: Objection to the form.

23 THE WITNESS: I didn't say that.

24 BY MR. BLOCK:

25 Q Well, I'm -- I'm asking you. 10:54:31

1 Is -- are six -- when six-year-old boys and
2 six-year-old girls play soccer together, is that a
3 threat to the safety of those six-year-old girls?

4 MR. FRAMPTON: Same objection.

5 Go ahead. 10:54:45

6 THE WITNESS: Generally, when six-year-olds
7 play soccer together, there is not high risk to --

8 BY MR. BLOCK:

9 Q I'm sorry, I -- I didn't hear the end of your
10 sentence. 10:55:06

11 A I said --

12 MR. FRAMPTON: Well, let me -- objection to
13 the form.

14 Go ahead and answer the question.

15 THE WITNESS: Six-year-olds play soccer 10:55:15
16 together. Their risks are -- the risk of injury, as
17 a group, is less.

18 BY MR. BLOCK:

19 Q Do you think the -- the risk is increased
20 when boys play? 10:55:33

21 A To the extent that boys are faster than
22 girls, there could be increased risk. The overall
23 speed and mass of six-year-olds is such that the
24 absolute risks are minuscule.

25 Q Okay. Are you providing an expert opinion 10:56:04

1 today on the safety implications of allowing
2 prepubertal boys and prepubertal girls to play
3 sports together on the same team?

4 MR. FRAMPTON: Objection to the form.

5 Go ahead.

10:56:25

6 THE WITNESS: I'm providing an opinion on the
7 safety issues of boys and girls playing together on
8 the same team, including prepube- -- the prepube- --
9 the prepubertal population.

10 BY MR. BLOCK:

10:56:44

11 Q So -- so you are -- you are also offering
12 testimony today on the safety of prepubertal boys
13 and prepubertal girls playing on the same team?

14 A I'm offering an opinion on safety as it --
15 when -- particularly when boys cross over into
16 girls' sports, play on teams that are designated as
17 girls' teams, and those -- and the issues there have
18 to do with retained differences.

10:57:02

19 Q Okay. So just focusing on prepubertal
20 population -- okay, so nothing about after puberty,
21 just focusing on prepubertal population -- are --
22 you are offering testimony that it -- there are
23 safety risks of -- well, I'll take that back.

10:57:38

24 Just focusing on the prepubertal population,
25 are you offering testimony that it is not safe for

10:57:51

1 prepubertal boys to play on -- on teams designated
2 for prepubertal girls?

3 MR. FRAMPTON: Objection to the form.

4 THE WITNESS: I believe that there is a
5 safety risk when -- that there can be a safety risk 10:58:06
6 when prepubertal boys cross over and play onto
7 girls' teams, yes.

8 BY MR. BLOCK:

9 Q Is there a safety risk when prepubertal boys
10 and prepubertal girls play on coed teams? 10:58:20

11 A Define a -- well, what coed team are you
12 talking about?

13 Q Well, a team that --

14 A Talking about -- are you talking about
15 recreational teams or competitive leagues? What are 10:58:33
16 you talking about?

17 Q Do you -- do you see a distinction between
18 the two?

19 A Yes, I do.

20 Q Okay. So do you think -- are you testifying 10:58:47
21 that there's a safety risk when prepubertal boys and
22 prepubertal girls play on coed recreational teams?

23 MR. FRAMPTON: Objection to the form.

24 THE WITNESS: So recreational teams are
25 unique in that they're primarily designed for 10:59:02

1 enjoyment. They're not primarily stratified for
2 purpose of competition. So oftentimes the rules in
3 these leagues are altered to promote safety.

4 MR. BLOCK: So can you --

5 Can the court reporter read back my question? 10:59:23

6 THE REPORTER: Yes.

7 (Record read.)

8 MR. FRAMPTON: Objection to the form.

9 Go ahead.

10 THE WITNESS: There -- there could be safety 10:59:53

11 risks with coed participation, yes.

12 BY MR. BLOCK:

13 Q On recreational teams?

14 A It depends on how the sport is structured,

15 but yes. 11:00:03

16 Q So you're comfortable saying when

17 six-year-olds play soccer together, the safety risks

18 are minuscule. Is that true when seven-year-olds

19 play -- prepubertal boys and girls play soccer

20 together? 11:00:19

21 MR. FRAMPTON: Object to the form.

22 Go ahead.

23 THE WITNESS: I couldn't speak to that.

24 BY MR. BLOCK:

25 Q But you can speak to six-year-olds? 11:00:26

1 MR. FRAMPTON: Same objection.

2 THE WITNESS: I have.

3 I thought I answered that question.

4 BY MR. BLOCK:

5 Q Why -- why can you speak to the safety 11:00:35
6 implications of six-year-olds, but not
7 seven-year-olds?

8 MR. FRAMPTON: Object to the form.

9 Go ahead.

10 THE WITNESS: As boys age, they develop skill 11:00:52
11 sets, and those evolve year to year.

12 BY MR. BLOCK:

13 Q So --

14 A I -- I cannot speak to a peer-reviewed study
15 that designates age six from age seven, no. 11:01:05

16 Q So the difference between, you know, six and
17 seven or, you know, six and eight is that the boys
18 are developing skill sets that they didn't have when
19 they were younger?

20 A In part. 11:01:23

21 MR. FRAMPTON: Objection to the form.

22 BY MR. BLOCK:

23 Q Can you repeat your answer?

24 MR. FRAMPTON: Yeah, my objection is noted.

25 Go ahead and repeat your answer. 11:01:32

1 THE WITNESS: In part.

2 BY MR. BLOCK:

3 Q Why -- what's the other part?

4 A Well, there are retained -- there are
5 biological differences from the beginning, and then 11:01:43
6 those biological differences start to combine with
7 additional distincters that begin to lead to
8 additive risk.

9 Q All right. But -- but those additional
10 distincters are a result of them acquiring 11:02:09
11 additional skills?

12 MR. FRAMPTON: Same objection.

13 Go ahead.

14 THE WITNESS: Well, define "skills." If by
15 "skills" you mean they're becoming faster, they're 11:02:23
16 starting to become stronger, then yes.

17 BY MR. BLOCK:

18 Q Well, you know, I'm trying to -- what did you
19 mean when you said develop additional skills a
20 couple of questions ago? 11:02:42

21 A Well, if you look at data on youth, in
22 elementary-aged youth, there's several studies out
23 there looking at population data, and they -- they
24 come to pretty consistent findings, which is that
25 boys outperform girls in measures of strength and 11:03:04

1 speed and girls are generally more flexible. And
2 the findings --

3 Q Why --

4 A -- are pretty consistent from region to
5 region and from investigator to investigator. 11:03:13

6 Q And why didn't you include a discussion of
7 that in -- in this June 2021 paper?

8 A I referenced Dr. Brown's paper, and he goes
9 through that fairly extensively.

10 Q Well, do you reference Dr. Brown in this 11:03:29
11 June 2021 paper?

12 A No.

13 Q Okay. So why didn't you discuss prepubertal
14 boys and girls in this June 2021 paper?

15 MR. FRAMPTON: Object to the form. 11:03:46
16 Go ahead.

17 THE WITNESS: That wasn't the focus of -- of
18 the paper. The focus of that paper was primarily
19 the effect of testosterone on athletic development.

20 BY MR. BLOCK: 11:04:07

21 Q Why did you make that the focus of your
22 June 2021 paper?

23 MR. FRAMPTON: Object to the form.

24 THE WITNESS: I don't recall offhand what
25 specifically went into that decision. 11:04:26

1 BY MR. BLOCK:

2 Q Can you recall what generally went into that
3 decision?

4 MR. FRAMPTON: Same objection.

5 THE WITNESS: I would say the same thing. 11:04:37

6 BY MR. BLOCK:

7 Q So you -- you don't know why you decided to
8 focus on testosterone, you know, beginning with the
9 onset of puberty for your June 2021 paper?

10 MR. TRYON: Objection. 11:04:53

11 MR. FRAMPTON: Same objection.

12 THE WITNESS: I -- I -- I can't recall
13 specifically why I excluded the prepubertal
14 population from that -- that paper.

15 BY MR. BLOCK: 11:05:03

16 Q If we go to page -- to paragraph 40, on
17 page 21 of the same document.

18 THE WITNESS: Let me know when you're there.

19 MR. FRAMPTON: Sorry, Josh, you said page 40?

20 MR. BLOCK: Paragraph 40, page -- 11:05:28

21 MR. FRAMPTON: Paragraph 40. Thank you. I'm
22 so sorry.

23 THE WITNESS: I think he did say page 40.

24 Hold on.

25 Okay. 11:05:44

1 BY MR. BLOCK:

2 Q If you go -- one, two, three, four, five --
3 seven -- seven or eight lines down, there's a
4 sentence that begins with "All of us."

5 A Okay. 11:05:59

6 Q That sentence says (as read):

7 "All of us are familiar with basic
8 objective physiological differences

9 between the sexes which become
10 apparent after the onset of puberty, 11:06:06

11 and persist throughout adulthood."

12 Did I read that right?

13 A You did.

14 Q And this sentence, again, is talking about
15 things that happen after the onset of puberty; 11:06:18
16 correct?

17 A Correct.

18 Q And there's nothing in this sentence
19 referring to prepubertal kids; correct?

20 A That wasn't the focus of this paper, so yes. 11:06:29

21 Q Okay. Now let's actually go to page 40,
22 paragraph 79. Let me know when you're there.

23 A I'm there.

24 Q So after -- in the middle of the paragraph,
25 after the parenthetical, that cites to Hilton, 11:06:59

1 DeVarona, and Harper, there's a sentence that begins
2 with "As a medical doctor."

3 Do you see that?

4 A I do.

5 Q Okay. So the -- it says (as read): 11:07:08

6 "As a medical doctor, I will focus
7 on those" --

8 I'll read this again, sorry. (As read):

9 "As a medical doctor, I will focus
10 on those specific sex-based 11:07:15

11 characteristics of males who have

12 undergone normal sex-determined

13 pubertal skeletal growth and

14 maturation that are relevant to the

15 safety of female athletes." 11:07:27

16 Did I read that right?

17 A Yes.

18 Q Okay. And so -- so this June 2021 paper is
19 focusing on sex-based characteristics of males who

20 have undergone normal sex-determined prepubertal 11:07:50

21 skeletal growth and maturation?

22 A Correct.

23 Q Why did you focus on people who have
24 undergone normal sex-determined prepubertal skeletal

25 growth and maturation? 11:08:03

1 A Well, I --

2 MR. FRAMPTON: Objection to form.

3 Go ahead.

4 THE WITNESS: I thought you asked me that
5 already, and I thought I answered that I -- I can't 11:08:14
6 recall what the reason was for specifically focusing
7 on adolescent, postadolescent, over prepubertal.

8 BY MR. BLOCK:

9 Q You don't -- do you have -- you didn't have
10 any background, medical training, that would, you 11:08:24
11 know, provide you information on why focusing on
12 changes that occur during puberty would be
13 important?

14 MR. TRYON: Objection.

15 MR. FRAMPTON: Objection to the form. 11:08:40

16 THE WITNESS: I already answered that
17 question. I think my last answer was best -- or my
18 first answer was best, but if you want me to answer
19 again, I will tell you again that I don't remember
20 why postadolescent or prepubertal -- or the pubertal 11:09:00
21 phase was focused on exclusively.

22 BY MR. BLOCK:

23 Q All right. Now let's turn to your expert
24 report dated February 23rd, 2022. So that's
25 Exhibit 80. 11:09:42

1 A Okay. I've got it.

2 Q So if you go to paragraph -- so page 9,
3 paragraph 11 C.

4 A Okay.

5 Q And in the middle of paragraph 11 C, the -- 11:10:07
6 there's a sentence that begins with "Even before."

7 A Correct.

8 Q So there you say (as read):

9 "Even before puberty, males have a
10 performance advantage over females 11:10:24
11 in most athletic events."

12 Correct?

13 A That is correct.

14 Q And that sentence wasn't contained in your
15 first version of your white paper from June 2021; 11:10:32
16 right?

17 A As I said, that was not the focus of that
18 paper, so that's correct.

19 Q Okay. Why did you decide to include it in
20 this paper? 11:10:48

21 A When --

22 MR. FRAMPTON: Objection to the form.

23 Go ahead.

24 THE WITNESS: When I was retained by
25 West Virginia in this case, discussions between 11:11:04

1 attorneys at ADF and attorneys at West Virginia --

2 MR. TRYON: I just want to insert here,
3 please don't -- again, this is attorney-client --
4 don't get into attorney-client protected
5 information. So discussions with counsel are 11:11:26
6 protected.

7 MR. FRAMPTON: Right.

8 MR. TRYON: But to the extent that you can
9 answer that without disclosing that -- those
10 communications, you may do so. 11:11:32

11 MR. FRAMPTON: Yeah, same -- same
12 instruction.

13 THE WITNESS: Okay. So I -- I -- I guess
14 what I would say is that the initial report was
15 filed -- was created prior to being retained by the 11:11:42
16 State of West Virginia and the updated paper that
17 you have was updated to include the prepubertal
18 population because my understanding is that the
19 defendant in this case is -- is young.

20 BY MR. BLOCK: 11:12:14

21 Q Before you were asked to update the white
22 paper, did you have an expert opinion regarding the
23 safety implications of prepubertal boys and girls
24 playing together?

25 MR. FRAMPTON: Objection to the form. 11:12:26

1 THE WITNESS: Many of the considerations that
2 exist in that first paper are relevant to the
3 prepubertal group. I suspected that they would
4 probably hold, and I do believe that they hold.

5 BY MR. BLOCK: 11:12:58

6 Q So -- so before you were asked to update your
7 paper, you had an expert opinion that it would be
8 unsafe for prepubertal girls and play -- and boys to
9 play together?

10 MR. FRAMPTON: Objection to the form. 11:13:10

11 THE WITNESS: As I said, I suspected that
12 there was probably risk in that population as well.

13 BY MR. BLOCK:

14 Q Now, you talked about the literature review
15 you conducted for creating your white paper. What 11:13:31
16 sort of literature review did you conduct for the
17 process of updating the right -- the white paper to
18 discuss prepubertal kids?

19 A I went more into the picture on population
20 testing, looking at what differences in performance 11:14:01
21 were between boys and girls. I looked at
22 international and national performance records,
23 databases. I looked at ratified standards for --
24 that had been determined through, for instance, the
25 presidential physical fitness test. 11:14:35

1 Q How did you identify what sources to look at?

2 A PubMed. I own -- well, PubMed.

3 Q Did you review any sources that were not
4 included in Dr. Brown's 2022 expert report?

5 MR. FRAMPTON: Objection to the form. 11:15:06

6 THE WITNESS: I couldn't speak to that
7 because I haven't cross-referenced his bibliography
8 to mine.

9 BY MR. BLOCK:

10 Q In paragraph 16, page 12 of your report, 11:15:26
11 could you turn to that?

12 A Yes, I'm there.

13 Q So -- so right before paragraph 17, the --
14 the final sentence in paragraph 16, it says (as
15 read): 11:15:53

16 "Although most easily documented in
17 athletes who have gone through
18 puberty, these differences are not
19 exclusively limited to
20 post-pubescent athletes either." 11:16:04

21 Did I read that right?

22 A You did.

23 Q Okay. And how -- can you explain to me how
24 these differences are most easily documented in
25 athletes who have gone through puberty? 11:16:17

1 A Of course.

2 The differences between men and women with
3 regards to strength and -- both upper and lower
4 body -- and muscle mass and power increase,
5 there's -- there's greater separation between the 11:16:48
6 sexes after puberty has occurred. That doesn't mean
7 that there's no difference prior.

8 Q But you -- you say it's most easily
9 documented. What did you mean by "most easily
10 documented"? 11:17:07

11 MR. FRAMPTON: Object to the form.

12 MR. BLOCK: I'm sorry, what's the -- what's
13 the form objection to that?

14 MR. FRAMPTON: The objection is I -- I
15 don't -- I don't think you've properly stated what 11:17:30
16 he said.

17 BY MR. BLOCK:

18 Q What -- what did you mean when you said "most
19 easily documented"?

20 A Meaning that the -- that wider differences 11:17:39
21 are more apparent than narrow differences.

22 Q So paragraph 17 says (as read):

23 "I have reviewed the expert
24 declaration of Gregory A. Brown,
25 Ph.D., FACM of February 23, 2022, 11:17:58

1 provided in this case..."

2 Correct?

3 A Correct.

4 Q Okay. And the date of this document that

5 we're reading from is also February 23rd, 2022; 11:18:09

6 correct?

7 A Correct.

8 Q Okay. So how did you read Dr. Brown's expert

9 declaration dated the same day as your declaration?

10 A That was provided to me by attorneys at ADF. 11:18:31

11 Q Did you read Dr. Brown's declaration after it

12 had already been signed?

13 A I can't speak to when he signed that, so I

14 don't know the answer to that question.

15 Q Did you review Dr. Brown's declaration on 11:18:52

16 February 23rd, 2022?

17 A I don't recall when I reviewed it.

18 Q Now, the sentence continues -- I'll just read

19 it from the beginning again.

20 (As read): 11:19:15

21 "I have reviewed the expert

22 declaration of Gregory A. Brown,

23 Ph.D., FACM of February 23, 2022,

24 provided in this case, which

25 includes evidence from a wide 11:19:23

1 variety of sources, including
2 population-based mass testing data,
3 as well as age-stratified
4 competition results, all of which
5 support the idea that prepubertal 11:19:35
6 males run faster, jump higher and
7 farther, exhibit higher aerobic
8 power output, and have greater upper
9 body strength (evidenced by stronger
10 hand grip and better performance 11:19:45
11 with chin-ups or bent arm hang) than
12 comparably aged females."

13 Did I read that right?

14 A You did.

15 Q Okay. And then you go on to say that this is 11:19:55
16 documented in Presidential Fitness Test, Euro
17 Fitness Test and additional mass testing data from
18 the UK and Australia; correct?

19 A Correct.

20 Q Now, are those fitness tests what you were 11:20:05
21 referring to earlier when you were discussing
22 additional research you had done to update your
23 white paper?

24 A Yes.

25 Q Okay. Do you actually cite to those fitness 11:20:18

1 test results in the bibliography of this white
2 paper?

3 A I don't believe that that's in there.

4 Q Okay. So does this refresh your recollection
5 about whether you -- about how -- I'll take this -- 11:20:36
6 I'll -- strike that. I'll ask again.

7 Do you -- did you become aware of these
8 differences in test results from reading Dr. Brown's
9 declaration?

10 A No. I had been familiar with some of those 11:20:55
11 papers prior.

12 Q When did you become familiar with them?

13 A In the course of -- likely in the course of
14 initial review, on -- on PubMed searches.

15 Q Can you turn to page 61 of the document? 11:21:24
16 That's your bibliography.

17 A Okay.

18 Q Can you point out to me the sources in the
19 bibliography addressing performance differences
20 between -- or -- or differences in body composition 11:22:03
21 between prepubertal girls and prepubertal boys?

22 A We're speaking to performance differences;
23 correct?

24 Q Or physiological differences.

25 A Papers that I referenced are not in there. 11:23:25

1 Q Okay. Why not?

2 A I reviewed -- papers that I had reviewed
3 beforehand were referenced within Dr. Brown's
4 report.

5 Q On the -- if -- going back to paragraph 17, 11:24:26
6 which is -- well, if you could go back to
7 paragraph 17. So that's pages 12 and 13.

8 12 and 13. Hopefully, I said that correctly.

9 If you could go to the end of paragraph 17,
10 which is on page 13. 11:24:51

11 A Okay.

12 Q Let me know when you're there.

13 A I'm there.

14 Q Okay. It says (as read):

15 In sum, a large and unbridgeable 11:25:01
16 performance gap exists between
17 the" -- "exists" --

18 Let me try that again. I need another cup of
19 coffee.

20 It says (as read): 11:25:11

21 "In sum, a large and unbridgeable
22 performance gap between the sexes is
23 well-studied and equally
24 well-documented, beginning in many
25 cases before puberty." 11:25:20

1 Do you see that sentence?

2 A I do.

3 Q Okay. Is -- do you believe that the
4 performance gap before puberty is unbridgeable?

5 A No, that's not what I said. 11:25:37

6 Q That's why I'm asking the question.

7 A No.

8 Q Do -- do you --

9 A What -- what it says is large and
10 unbridgeable performance gap between the sexes is 11:25:46
11 well-studied beginning in many cases before puberty.

12 Q Okay. In -- in many cases, is there an
13 unbridgeable performance gap before puberty?

14 A I believe, based on the -- I believe if you
15 look at the -- of how sex-based records break down, 11:26:14
16 that we're talking about upper-end performance that
17 it reflects, in -- as I said, in many cases, an
18 unbridgeable gap.

19 Q How about average differences between boys
20 and girls before puberty, is the gap so large to be 11:26:44
21 unbridgeable?

22 A Not in all cases, no.

23 Q In which case is -- is it large enough to be
24 unbreakable?

25 A Well, for example, boys can outperform girls 11:27:02

1 as early as age seven and ups at between 100 and
2 1200 percent improved.

3 Q And do you have an expert opinion on whether
4 or not those differences are attributable to innate
5 physiological characteristics? 11:27:41

6 A As -- as a physician who works with athletes
7 of all ages, every day, I do have an opinion that
8 biology plays a role in the measured performance
9 differences that exist in the literature with
10 respect to prepubertal children, yes. 11:28:11

11 Q So you said biology plays a role.
12 Is biology the exclusive thing that plays a
13 role?

14 A I'm not aware of any peer-reviewed study that
15 looks at the exact contribution of biology versus 11:28:36
16 other causes when it comes to performance in
17 prepubertal children.

18 Q Are you -- are you aware of any data
19 measuring the performance of transgender girls
20 before puberty in -- in athletic contests or 11:28:51
21 physical fitness studies?

22 A I'm not aware of any literature looking
23 specifically at prepubertal transgender girls in --
24 in their performance of sport, no.

25 Q Just to clarify the scope of your expert 11:29:14

1 opinions in this case, are you providing an expert
2 opinion in this case regarding athletic advantages
3 between males and females?

4 MR. FRAMPTON: Objection; form.

5 Go ahead. 11:29:46

6 THE WITNESS: I am providing an opinion in
7 this case on the safety issues that exist when those
8 of one sex cross over and participate in sports.

9 BY MR. BLOCK:

10 Q So -- so your expert opinion in this case is 11:30:01
11 exclusively about the safety issues; correct?

12 THE VIDEOGRAPHER: I believe Dr. Carlson's
13 Internet might have been having a problem. You
14 might need to repeat your question.

15 MR. BLOCK: Sure. 11:30:37

16 BY MR. BLOCK:

17 Q So your expert testimony in this case is
18 exclusively about the safety issues involved when
19 males and females play together; right?

20 MR. FRAMPTON: Objection; form. 11:30:53

21 Go ahead.

22 THE WITNESS: It is about the safety issues
23 that are involved when males and -- when males cross
24 over into women's sports particularly, and some of
25 that opinion relates to differences in certain 11:31:08

1 variables, such as speed.

2 BY MR. BLOCK:

3 Q You're not providing an expert opinion on the
4 fairness of allowing transgender girls to
5 participate on girls' teams; right? 11:31:29

6 A I'm not providing an opinion on fairness as
7 relates to transgender participation, no.

8 Q If you could go to paragraph 21 of your
9 report -- it's on page 15. So about four lines from
10 the top -- there's a sentence that begins with "To 11:32:12
11 the latter point."

12 A "To the latter point, children don't play
13 contact sports..."?

14 Q Yeah. So it says (as read):
15 "To the latter point, children don't 11:32:28
16 play contact sports with adults and,
17 in a great majority of cases, men
18 and women compete in categories
19 specific to their own biological
20 sex." 11:32:37

21 Do you see that?

22 A I do.

23 Q Okay. And so that sentence has been changed
24 from the version of that sentence that appeared in
25 your June 2021 report; correct? 11:32:49

1 A I can't recall. I'd have to go back and look
2 at that report.

3 Q Okay. Let's go back and look at it. It's on
4 page 11 of your earlier report.

5 A Okay. 11:33:37

6 Q All right. So on page 11 of your report,
7 paragraph 18, a couple lines from the bottom, it
8 says (as read):

9 "To the latter point, children don't
10 play contact sports with adults and, 11:33:45
11 as has already been discussed, after
12 the onset of puberty, men and women
13 compete in categories specific to
14 their own biological sex."

15 Do you see that? 11:33:54

16 A I do.

17 Q Okay. And so then in your February report,
18 the -- the words after "the onset of puberty" are
19 taken out, and the words "in the great majority of
20 cases" are -- are put in; is that right? 11:34:10

21 A Correct.

22 Q Okay. And so why did you make that change?

23 A Well, I believe, as we had discussed, the
24 focus on the first draft was primarily in the
25 adolescent age and later, and the second draft was 11:34:23

1 expanded slightly to include consideration of the
2 prepubertal athlete. And since sport -- gender --
3 or sex stratification in youth teams is still widely
4 prevalent, they altered those words.

5 Q Are you providing an expert opinion in this 11:34:50
6 case about transgender girls and women who never go
7 through endogenous puberty as a result of puberty
8 blockers followed by gender-affirming hormones?

9 MR. FRAMPTON: Objection; form.

10 THE WITNESS: Can you -- you ask that one 11:35:07
11 more time?

12 BY MR. BLOCK:

13 Q Yeah. So are you providing an expert
14 report -- excuse me, I'll say it again.

15 Are you providing an expert opinion in this 11:35:14
16 case about transgender girls and women who never go
17 through endogenous puberty as a result of taking
18 puberty blockers followed by gender-affirming
19 hormones?

20 MR. FRAMPTON: Same objection. 11:35:29
21 Go ahead.

22 THE WITNESS: So to the extent that they are
23 prepubertal biological males, yes.

24 BY MR. BLOCK:

25 Q How about to the extent that they have 11:35:36

1 received puberty blockers followed by
2 gender-affirming hormones to stimulate the
3 equivalent of a typically female puberty?

4 MR. FRAMPTON: Objection; form.

5 THE WITNESS: My opinion in this case extends 11:35:51
6 to sports safety issues in both the prepubertal and
7 the pubertal population.

8 BY MR. BLOCK:

9 Q Okay. Does it address safety issues of the
10 participation of transgender girls and women who 11:36:11
11 receive puberty blockers and then receive
12 gender-affirming hormone therapy that has effects on
13 bone and muscle structure and causes them to
14 develop, you know, typically female hips and -- and
15 things like that? 11:36:26

16 MR. FRAMPTON: Objection to form.

17 MR. TRYON: Objection; form.

18 THE WITNESS: That's -- that's a complex
19 question. Can you unpack that a little bit?

20 BY MR. BLOCK: 11:36:39

21 Q Sure. So you, so far -- in response to my
22 questions about people who have blockers, you've
23 equated transgender girls who have blockers to
24 prepubertal boys and someone who has -- a
25 transgender girl who has puberty blockers and then 11:36:52

1 receives gender-affirming hormones, you know,
2 stimulates a lot of other changes that prepubertal
3 boys don't have; correct?

4 MR. FRAMPTON: Objection to form.

5 THE WITNESS: I don't -- 11:37:05

6 MR. FRAMPTON: Go ahead.

7 THE WITNESS: I don't think that that's been
8 widely looked at. I know that there's -- I -- I
9 don't think that that's been widely looked at or
10 extensively looked at, as to what the effects of 11:37:16
11 that treatment would be on athletic performance.

12 BY MR. BLOCK:

13 Q Are you providing an expert opinion on what
14 the effects of that treatment would be on safety?

15 MR. FRAMPTON: Object to the form. 11:37:36
16 Go ahead.

17 THE WITNESS: I'm providing an opinion on the
18 potential effects on safety of a biological male,
19 even at age 10 or 11, pick your age, of crossing
20 over into a woman's sport and participating in 11:37:53
21 contact and collision sports.

22 BY MR. BLOCK:

23 Q All right. That's not the answer to my
24 question. I -- I asked are you providing an expert
25 opinion on the safety of -- of some -- a transgender 11:38:03

1 girl who has received blockers and then
2 gender-affirming hormones participating on girls'
3 sports teams.

4 A Am I -- I -- I am providing an opinion on the
5 potential safety issues of a hypothetical individual 11:38:39
6 like this participating on girls' sport team --
7 girls' sports teams, yes.

8 Q What -- what's your basis for providing an
9 expert opinion regarding a transgender girl who has
10 received blockers and then gone on to receive 11:38:57
11 gender-affirming hormones?

12 A That would have to do with whether or not
13 there are differences between the sexes at the time
14 of puberty.

15 Q Well, I'm talking about someone who has 11:39:21
16 received blockers but then received gender-affirming
17 hormones to stimulate the equivalent of a typically
18 female puberty.

19 Are you -- what's your basis for providing an
20 expert opinion on the safety risks of that person 11:39:39
21 participating on girls' sports?

22 MR. TRYON: Objection.

23 THE WITNESS: To my --

24 MR. FRAMPTON: Objection to form.

25 ///

1 BY MR. BLOCK:

2 Q You can answer.

3 A There's not extensive research looking at the
4 situation that you're talking about.

5 Q So -- 11:39:59

6 A The effect of sports -- of gender-affirming
7 hormones on sports participation.

8 Q So if there's not a lot of research, do you
9 have a basis for offering an expert opinion about
10 it? 11:40:16

11 MR. FRAMPTON: Same objection.

12 Go ahead.

13 THE WITNESS: My opinion is grounded in an
14 understanding of what plays into injury risk and
15 differences that exist between the sexes. 11:40:30

16 BY MR. BLOCK:

17 Q Do you know what differences exist for --
18 between a cisgender woman and a transgender woman
19 who received puberty blockers followed by
20 gender-affirming hormones? 11:40:49

21 MR. TRYON: Objection to form.

22 THE WITNESS: My -- my understanding is there
23 is retained differences in lean body mass between
24 them.

25 ///

1 BY MR. BLOCK:

2 Q What's that understanding based on?

3 A The one study I'm familiar with that looked
4 at that, which was authored by Klaver.

5 Q And that's a study that you didn't cite in 11:41:10
6 your report; correct?

7 A Correct.

8 Q You only looked at that study for the first
9 time in preparing for this deposition; correct?

10 MR. FRAMPTON: Objection to the form. 11:41:22

11 BY MR. BLOCK:

12 Q You can answer.

13 A I looked at it in preparation for this
14 deposition, yes.

15 Q So you looked at it for the first time after 11:41:37
16 you had already submitted your report; correct?

17 A Correct.

18 Q And is it your understanding that the people
19 in that study received puberty blockers at the
20 beginning of Tanner II? 11:41:49

21 A Around -- I believe around age 13, 14.

22 Q And as a medical doctor, what's your
23 understanding of when Tanner II typically begins for
24 boys?

25 A Again, I'm a sports medicine physician. I'm 11:42:05

1 not an endocrinologist.

2 Q Well --

3 MR. FRAMPTON: Did it not pick up his answer?
4 I thought he answered the -- there was no reaction
5 when he said an age, so I just wanted to make sure 11:42:27
6 it was picked up.

7 MR. BLOCK: It was not.

8 MR. FRAMPTON: Okay.

9 THE WITNESS: I said age 12.

10 BY MR. BLOCK: 11:42:34

11 Q Age 12.

12 Have you done any modeling of the safety
13 risks associated with prepubertal boys playing on
14 sports teams with prepubertal girls?

15 MR. FRAMPTON: Objection to the form. 11:42:57

16 Go ahead.

17 THE WITNESS: Define what you mean by
18 "modeling."

19 BY MR. BLOCK:

20 Q You discuss modeling of safety risks in your 11:43:08
21 report, don't you?

22 A Correct.

23 Q So that's what I mean by "modeling."

24 Have you conducted any modeling of the safety
25 risks of prepubertal boys playing on teams with 11:43:22

1 prepubertal girls?

2 A I'm not sure what you mean by modeling these
3 risks. The -- the extent to which prepubertal kids
4 do or don't fit into that model depends on whether
5 there are measurable differences between the sexes 11:43:50
6 in terms of things like speed or strength.

7 Q And so --

8 A To the extent that there are measurable
9 differences noted between them, then, yes, the model
10 applies. 11:44:13

11 Q But you haven't actually done that modeling,
12 have you?

13 MR. FRAMPTON: Objection to the form.

14 THE WITNESS: I thought I answered that
15 question. I'm not sure -- do you mean have I 11:44:22
16 published data on that?

17 BY MR. BLOCK:

18 Q Not have you published it. Have you done it
19 yourself? Have you plugged the values into
20 equations and -- and come up with a model similar 11:44:35
21 to, you know, rugby's model?

22 MR. FRAMPTON: Objection to the form.

23 Go ahead.

24 THE WITNESS: Have I taken a calculator and
25 calculated this out with prepubertals? I'm not sure 11:44:56

1 I understand why that's necessary.

2 If -- if -- there either are or there aren't
3 differences between the sexes in terms of variables
4 that equate to athletic performance or -- or lead to
5 athletic performance, and if there are, then 11:45:19
6 absolute injury risk can be increased.

7 BY MR. BLOCK:

8 Q So you don't -- no -- no matter how small a
9 difference is, you don't think that's relevant to
10 assessing, you know, safety risks? 11:45:33

11 MR. FRAMPTON: Object to the form.

12 THE WITNESS: I'm not sure what you're asking
13 there, but -- but measurable differences can lead to
14 increased safety risk, yes.

15 BY MR. BLOCK: 11:45:55

16 Q World Rugby actually calculated a -- a model
17 of the safety risks of an average man playing rugby
18 with an average woman; correct?

19 A Correct. That was part of their process.

20 Q Okay. And so they went through the steps of 11:46:12
21 actually calculating it; correct?

22 A They did.

23 Q Okay. And -- but you did not go through
24 those steps for purposes of calculating a safety
25 risk of an -- prepubertal boys playing on teams with 11:46:26

1 prepubertal girls; right?

2 MR. FRAMPTON: Same objection.

3 THE WITNESS: Well, I think I speak to the --
4 in the paper as to how that risk might be
5 calculated. 11:46:39

6 BY MR. BLOCK:

7 Q Yeah, you -- you spoke to how it might be
8 calculated, but you didn't actually calculate it;
9 correct?

10 A I'm not -- I'm not sure where you're going 11:46:46
11 with that, but --

12 Q I just need a "yes" or "no" answer whether
13 you did it or not.

14 MR. FRAMPTON: Object to the form.

15 Go ahead. 11:46:55

16 BY MR. BLOCK:

17 Q You did not actually go through the steps of
18 calculating the model of the safety risk for
19 prepubertal boys playing with prepubertal girls?

20 A I did not take, for example, an 11:47:02
21 eight-year-old male and -- his mass and speed into a
22 force equation and then compare it to another
23 eight-year-old female. I'm not sure what that
24 was -- would accomplish.

25 Q Okay. So how -- so you don't have the -- the 11:47:19

1 modeling data to compare the relative risk for
2 prepubertal kids to the relative risk for men and
3 women after puberty, do you?

4 A I do not have a database to present to you,
5 no. 11:47:41

6 Q Is it your understanding that the risk is
7 smaller for prepubertal kids than for people after
8 puberty?

9 MR. TRYON: Objection; form of the question.

10 MR. FRAMPTON: Same objection. 11:47:57

11 THE WITNESS: Do you want to rephrase?

12 BY MR. BLOCK:

13 Q Is -- is it your understanding that the
14 increased risk is smaller with respect to
15 prepubertal boys and girls than adult men and women? 11:48:10

16 MR. TRYON: Objection to form.

17 THE WITNESS: I'm asked -- I'm retained to
18 look to -- to weigh in on whether or not a risk
19 exists, and based on differences between the sexes,
20 even at a prepubertal age, a heightened risk exists. 11:48:28

21 BY MR. BLOCK:

22 Q So -- wait, so -- so your expert opinion is
23 only whether or not there is exists -- a risk
24 exists, not on how great the risk is?

25 MR. FRAMPTON: Object to the form. 11:48:42

1 THE WITNESS: I can -- I can speak to the
2 fact that the risk is going to be greater with a
3 larger, faster, more powerful individual than it
4 would be with somebody who is less so, but as long
5 as there are retained differences, there's still 11:49:01
6 risk.

7 BY MR. BLOCK:

8 Q Have you calculated the difference in risk
9 from a woman with PCOS participating in women's
10 sports? 11:49:19

11 A I'm not -- I haven't been retained to weigh
12 in on individuals with disorders of sexual
13 development.

14 Q Okay. So do you -- you don't know one way or
15 another whether or not there's an increased risk 11:49:32
16 when a woman with PCOS plays with other women in --
17 in female sports?

18 MR. TRYON: Objection to form.

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: I have not looked at that 11:49:49
21 specifically.

22 BY MR. BLOCK:

23 Q So --

24 A To my knowledge, there is not a peer-reviewed
25 study looking at individuals who have PCOS and their 11:49:56

1 imparted risk on an athletic field.

2 Q And there's no peer-reviewed study looking at
3 prepubertal kids and their -- boys and their
4 imparted risk on an athletic field, is there?

5 A That's why I was retained. 11:50:18

6 Q Okay. And there's no peer-reviewed study
7 looking at transgender women and their risk to other
8 women from participating in an athletic field;
9 right?

10 MR. FRAMPTON: Object to the form. 11:50:30

11 Go ahead.

12 THE WITNESS: There are multiple studies that
13 show retention of significant differences in the
14 types of things that would lead to disparities in
15 strength, power, speed, etcetera, all of which can 11:50:47
16 contribute to heightened injury risk, which was the
17 underpinning of World Rugby's finding.

18 BY MR. BLOCK:

19 Q Right. But --

20 MR. BLOCK: Can you read back my question, 11:50:58
21 Court Reporter.

22 (Record read.)

23 MR. FRAMPTON: Same objection.

24 MR. TRYON: Objection; form.

25 THE WITNESS: To my knowledge, there has been 11:51:21

1 no peer-reviewed study looking at the injury risk
2 that exists to cisgender women when transgender
3 women cross over and play. That issue is, to my
4 knowledge, not often tracked.

5 BY MR. BLOCK: 11:51:45

6 Q Can we look at page 2 of your report.

7 A Which report are you talking about?

8 Q Your -- your February report.

9 MR. FRAMPTON: I'm sorry, Josh, what -- what
10 page did you tell him to go to? 11:52:05

11 MR. BLOCK: Page 2. Exhibit --

12 MR. TRYON: Which exhibit is this, please?

13 MR. BLOCK: 80. Exhibit 80.

14 THE WITNESS: Okay.

15 BY MR. BLOCK: 11:52:26

16 Q If you look at the -- the final sentence, at
17 the bottom, that begins with "As a medical doctor."

18 A Okay.

19 Q It says (as read):

20 "As a medical doctor who has spent 11:52:32

21 my career in sports medicine, it is

22 my opinion that World Rugby's

23 assessment of the evidence is

24 scientifically sound, and that

25 injury modeling meaningfully 11:52:41

1 predicts that biologically male
2 transgender athletes do constitute a
3 safety risk for the biologically
4 female athlete in women's sports."

5 Did I read that right? 11:52:53

6 A Yes.

7 Q And so you think that World Rugby did a
8 thorough job; correct?

9 A I think that their approach, as they've
10 described it, was sound. I wouldn't say that they 11:53:10
11 did a thorough job, no.

12 Q Why wouldn't you?

13 A Because the research database that they
14 published relates completely to adult athletes or
15 postpubescent athletes. 11:53:33

16 Q How do you know that?

17 A Because I've looked at it.

18 Q When did you look at it to determine whether
19 it relates solely to adult athletes?

20 MR. FRAMPTON: Object to the form. 11:53:46

21 Go ahead.

22 THE WITNESS: I -- I can't tell you that
23 exactly. It would have been around the time that I
24 was reformatting this report.

25 ///

1 BY MR. BLOCK:

2 Q So you looked more closely at that issue, you
3 know, after the first version of your report was
4 filed; right?

5 A Yes. 11:54:00

6 Q What is World Rugby's policy with respect to
7 the participation of transgender women who have had
8 puberty blockers followed by gender-affirming
9 hormones?

10 A By understanding is that they, in their 11:54:13
11 policy statement, have stated that those individuals
12 are not subject to the same exclusions.

13 Q When did you become aware that World Rugby
14 allows those individuals to participate?

15 MR. FRAMPTON: Object to the form. 11:54:36

16 THE WITNESS: Well, it's -- it's in their
17 report. So I don't recall. I mean, at -- again, at
18 the point in time that I was reviewing their data.
19 I can't tell you when that was.

20 BY MR. BLOCK: 11:54:47

21 Q When -- when you submitted your June 2021
22 report, were you aware that World Rugby allowed
23 transgender women to participate if they had
24 received blockers and never gone through endogenous
25 puberty? 11:55:02

1 MR. FRAMPTON: Objection; form.

2 Go ahead.

3 THE WITNESS: I can't -- I can't recall. I
4 can't speak to that. Again, it wasn't really the
5 focus of that report. 11:55:17

6 BY MR. BLOCK:

7 Q So do -- do you think that you know better
8 than World Rugby about the safety risks of allowing
9 a transgender woman to play if she's received
10 blockers followed by gender-affirming care? 11:55:31

11 MR. FRAMPTON: Objection to form.

12 MR. TRYON: Objection to form.

13 MR. FRAMPTON: Go ahead.

14 THE WITNESS: I think with any set of
15 guidelines, clinicians particularity, since these 11:55:41
16 types of things bear relevance on what we do, we
17 have to kind of look at everything and make
18 determinations based on what we know and what's
19 being said.

20 And so I -- I can agree with the bulk of the 11:55:54
21 findings of World Rugby, particularly with regards
22 to the type of athlete that's reflected in the
23 literature review that they've provided, and still
24 take exception with the idea that there isn't
25 risk -- that there isn't a risk consideration with 11:56:21

1 prepubertal athletes.

2 BY MR. BLOCK:

3 Q Do -- you don't -- do you think that the
4 degree of -- of risk is relevant in determining
5 whether it justifies an exclusion? 11:56:30

6 A That's a policy --

7 MR. FRAMPTON: Objection to form and scope.
8 Go ahead.

9 THE WITNESS: That's a policy issue. That's
10 not my job. My job is just to say is there a risk. 11:56:40

11 BY MR. BLOCK:

12 Q All right. Well, there's increased risk from
13 the participation of a taller cisgender woman;
14 correct?

15 A That's a vague question. Can you restate it? 11:56:52

16 Q Yeah. So the taller -- so when -- the taller
17 a female athlete is, the more she increases the risk
18 of injury for other female athletes; correct?

19 A Again, I don't feel like I can answer that
20 question. You're not providing me with enough 11:57:19
21 context.

22 Q Well, you said as long as there's a
23 difference, that that can create risk.

24 So doesn't height affect the safety risks for
25 other athletes? 11:57:33

1 A Height in the context of what? Give me
2 context.

3 Q How about volleyball.

4 A Okay. So ask it in -- in the context of
5 volleyball. 11:57:49

6 Q So the taller a female athlete is, the
7 greater risk she poses to other female athletes in
8 volleyball; correct?

9 A So we're talking about biological females
10 playing with each other? Is that what we're talking 11:57:59
11 about?

12 Q Yes.

13 A I -- I think with -- when it comes to
14 biological females playing together, they tend to --
15 there are outliers, of course, but they're outliers 11:58:16
16 within a relatively defined biological pool.

17 To your question, if you have a really tall
18 athlete in volleyball, at the net, they're going to
19 be able to spike the ball vertically, theoretically,
20 or forcefully, but it's not just height that plays 11:58:42
21 into that. It's leg strength. It's jumping
22 ability. It's arm extension. So you've got a
23 convergence of factors that are going to play into
24 it.

25 But -- but within the sexes, yeah, you can 11:58:55

1 have some individuals that provide -- who -- who are
2 larger and taller, stronger than others.

3 But that's not the same thing as blending
4 sexes.

5 Q So -- but you're not -- you're not providing 11:59:17
6 an expert opinion on the degree of risks; correct?
7 You're just providing an expert opinion on whether a
8 risk of any amount exists?

9 MR. FRAMPTON: Objection to the form.

10 THE WITNESS: I was retained in this case to 11:59:33
11 provide an opinion on whether there -- there's a
12 safety risk associated with gender crossover in
13 interscholastic sports.

14 BY MR. BLOCK:

15 Q So -- 11:59:47

16 A And it's not my role to determine the
17 relevance of absolute risk; it's just to say whether
18 a risk exists.

19 Q Okay. So you're not providing an expert
20 opinion comparing the degree of risk from allowing a 12:00:03
21 transgender woman to compete to the degree of risk
22 from allowing any particular cisgender woman to
23 compete?

24 A Well, I didn't say that.

25 MR. FRAMPTON: Objection to the form. 12:00:18

1 BY MR. BLOCK:

2 Q That's my question.

3 So -- so you're -- are you -- are you -- are
4 you providing an opinion that allowing a transgender
5 woman who's received blockers to compete with other 12:00:27
6 women provides a greater safety risk than allowing
7 certain cisgender women to compete on the team?

8 MR. FRAMPTON: Objection to the form.

9 THE WITNESS: I am arguing that allowing a
10 transgender -- a biologically born male who 12:00:47
11 transitions to a female and plays on a female sports
12 team, I am arguing that there are safety risks
13 associated with that, yes.

14 BY MR. BLOCK:

15 Q So -- so I'm focusing now -- 12:01:09

16 A That have the potential to exceed that of
17 overall risks when cisgender athletes are playing
18 together.

19 Q So I'm -- I'm focusing specifically on a
20 transgender woman who has received blockers followed 12:01:23
21 by gender-affirming care. So I want to focus your
22 attention on that specific fact pattern.

23 The only physiological difference that has
24 been identified in your report, you know, for that
25 population of people, is potentially 10 percent 12:01:36

1 greater lean body mass.

2 And my question is, are you providing an
3 expert opinion on whether there's a greater risk for
4 allowing that person to participate on a woman's
5 team than allowing a cisgender woman with 10 percent 12:01:56
6 greater body mass than the average woman participate
7 on a woman's team?

8 MR. FRAMPTON: Objection to the form.

9 Go ahead.

10 THE WITNESS: You're comparing apples and 12:02:06
11 oranges because you're talking about a biological
12 male that brings a certain -- that can bring certain
13 characteristics to puberty with him.

14 BY MR. BLOCK:

15 Q Well, the only characteristic identified is 12:02:21
16 10 percent difference in body mass.

17 A That's the only characteristic you
18 identified.

19 Q What -- what other physiological
20 characteristic, you know, exists? 12:02:31

21 A Again, going back to published data on
22 performance in the elementary school population,
23 there are consistent findings of greater strength
24 and speed in preadolescent boys than preadolescent
25 girls. 12:02:56

1 Q But those -- those aren't -- those aren't
2 discussions of physiological -- innate physiological
3 characteristics, are they?

4 A We don't know that.

5 MR. FRAMPTON: Object to the form. 12:03:04

6 THE WITNESS: We -- we -- I -- in fact, I
7 suspect that there's a significant biological
8 contribution to that.

9 BY MR. BLOCK:

10 Q So what -- what -- what study have you done 12:03:13
11 on physiological differences between prepubertal
12 boys and girls?

13 A What study have I done?

14 MR. FRAMPTON: Objection to the form.

15 THE WITNESS: Is that what you said? 12:03:23

16 BY MR. BLOCK:

17 Q Yeah.

18 MR. FRAMPTON: Objection to the form.

19 Answer the question.

20 THE WITNESS: I have not conducted a study on 12:03:27
21 physiological differences between preadolescent boys
22 and girls.

23 BY MR. BLOCK:

24 Q All right. Are there -- are there
25 differences in bone structure between preadolescent 12:03:35

1 boys and girls, you know, relevant to athletic
2 performance?

3 A I believe that the differences that exist
4 between boys and girls are performance based. There
5 is a biological difference in lean body mass between 12:04:04
6 boys and girls that manifest at a very early age.
7 There are other performance-based measures that
8 contribute to risk that are well defined.

9 Q So focusing on 10 percent difference in lean
10 body mass that -- on average, are you providing an 12:04:20
11 opinion on whether -- if the only physiological
12 difference is 10 percent lean body mass -- let me
13 phra that -- phrase that again.

14 Are you providing an expert opinion comparing
15 the risk associated with allowing a transgender 12:04:41
16 woman who has been on blockers and hormones and has
17 10 percent greater lean body mass than a cisgender
18 woman to the risk of allowing a cisgender woman with
19 10 percent greater lean body mass than an average
20 cisgender woman to participate in women's sports? 12:05:01

21 MR. TRYON: Objection to form.

22 MR. FRAMPTON: Objection to form and scope.

23 THE WITNESS: That question has assumptions
24 in it that I think keep me from answering it.

25 ///

1 BY MR. BLOCK:

2 Q The --

3 A You're -- you're -- you're equating the two
4 without acknowledging that there are sex-based
5 differences in performance that play into injury 12:05:28
6 risk that are brought to that point.

7 So I don't know how to answer your question.

8 Q You -- you know, are -- you've said
9 repeatedly you're not providing an opinion
10 quantifying the amount of risk; you're just 12:05:48
11 providing an opinion that some quantum of increased
12 risk exists; correct?

13 A Correct.

14 MR. FRAMPTON: Object to the form.

15 BY MR. BLOCK: 12:06:05

16 Q I didn't hear the answer.

17 A I'm providing an opinion as to the fact that
18 there is risk.

19 Q And there is also increased risk when a
20 cisgender woman with 10 percent greater lean body 12:06:12
21 mass than an average cisgender woman participates in
22 women's sports; correct?

23 MR. TRYON: Objection to form.

24 MR. FRAMPTON: Same objection.

25 THE WITNESS: Repeat that question. 12:06:27

1 MR. BLOCK:

2 Q There is an increased risk to safety when a
3 cisgender woman with 10 percent greater lean body
4 mass than an average cisgender woman participates in
5 women's sports; correct? 12:06:39

6 MR. TRYON: Objection.

7 MR. FRAMPTON: Objection.

8 THE WITNESS: I didn't say that.

9 BY MR. BLOCK:

10 Q Is there or is there not? 12:06:43

11 A There's more than just that variable that
12 play into injury risk with --

13 Q There might be -- there might -- I'm sorry, I
14 said I wouldn't cut you off. Go ahead and answer.

15 A If the question was is a cisgender woman with 12:07:02
16 10 percent increased lean body mass, in part, higher
17 injury risk to other female cisgender athletes, the
18 answer is you can't answer that question because
19 there are other things that play in.

20 Q I don't -- 12:07:22

21 A I'm saying is the -- you're phrasing this
22 question as if the only difference between an
23 individual who comes to the point of going onto
24 puberty blockers is a 10 percent difference in lean
25 body mass, and I'm telling you that there are 12:07:42

1 population-based performance differences between the
2 sexes that exist prior to that.

3 Q All right. So --

4 A I'm not sure how to answer that question.

5 Q Are there any differences in the Klaver study 12:07:59
6 identified between cisgender women and the
7 transgender women in the study other than the
8 10 percent greater lean body mass?

9 A Some differences in fat distribution.

10 Q There are differences in -- in fat 12:08:17
11 distribution at the end of the period?

12 A There are.

13 Q You know what? I'll come back to that. I
14 don't want to waste my time.

15 I'm still struggling with your -- your answer 12:08:47
16 to whether or not you're capable of providing an
17 expert opinion comparing the risks of allowing a
18 transgender woman to participate to the risks of
19 allowing an unusually tall or an unusually strong
20 cisgender woman to participate. So I -- 12:09:03

21 MR. FRAMPTON: Object --

22 MR. BLOCK: I -- I haven't finished my
23 question yet. You can object --

24 MR. FRAMPTON: I'm sorry. My apologies.

25 MR. BLOCK: Yeah. Okay. 12:09:12

1 BY MR. BLOCK:

2 Q So I'm -- I'm still struggling with that.

3 So are you -- are you or are you not

4 providing an expert opinion comparing the relative

5 risks between transgender women participating and 12:09:26

6 between unusually strong or tall cisgender women

7 participating in women's sports?

8 A Yes.

9 MR. FRAMPTON: Object to form.

10 BY MR. BLOCK: 12:09:37

11 Q Yes, you are?

12 A Yes.

13 Q How -- okay. How are you able to provide

14 that opinion if you are unable to quantify the

15 amount of increased risk for -- when transgender 12:09:44

16 women participate?

17 MR. FRAMPTON: Same objection.

18 Go ahead.

19 THE WITNESS: You don't need to quantify risk

20 in a -- in a modeling scenario to know that risk is 12:10:05

21 increased. The model -- going back to World Rugby,

22 to just consideration of issues like speed, power,

23 mass.

24 BY MR. BLOCK:

25 Q How are you able to compare two things 12:10:34

1 without quantifying them?

2 A Well, I don't think either side has been
3 quantified, has it?

4 Q Well, no.

5 So how do you know that the risks of allowing 12:10:47
6 a transgender woman who's been on blockers and
7 gender-affirming hormones to participate is greater
8 or less than the risk of allowing an unusually
9 strong or tall cisgender woman to participate on
10 women's sports? 12:11:06

11 MR. TRYON: Objection --

12 THE WITNESS: I think that goes --

13 MR. TRYON: -- to the form of the question.

14 THE WITNESS: -- to the whole -- the whole
15 heart of this case, which is that when you bring 12:11:11
16 biological males into a pool of biological females,
17 that you're bringing not just in body mass, but --
18 but a other list of -- of retained differences that
19 have the potential to be greater than -- than
20 anything that you're going to see in that second 12:11:37
21 pool of -- of athletes.

22 And -- and so normal variation between the
23 sexes and what that means for injury doesn't look
24 the same as what it -- what that risk would look
25 like if you're bringing somebody who isn't in that 12:11:56

1 category and placing them in that second group.

2 That was the whole point of World Rugby's

3 assertions.

4 BY MR. BLOCK:

5 Q The differences between cisgender men and 12:12:06
6 cisgender women are far greater than a 10 percent
7 difference in lean body mass; correct?

8 A 10 percent -- say that one more time.

9 Q The differences between cisgender men and
10 cisgender women that were analyzed by World Rugby 12:12:23
11 were far greater than a difference in 10 percent
12 lean body mass; correct?

13 MR. FRAMPTON: Objection to the form.

14 Go ahead.

15 THE WITNESS: I believe that's accurate. 12:12:36
16 I'm -- I would have to go back and look at the
17 report.

18 BY MR. BLOCK:

19 Q So, in fact, the differences between adult
20 cisgender men and adult cisgender women are far 12:12:45
21 greater than the differences between prepubertal
22 boys and prepubertal girls; correct?

23 MR. FRAMPTON: Objection to the form.

24 THE WITNESS: There is a -- are you talking
25 about lean body mass? 12:13:03

1 BY MR. BLOCK:

2 Q I'm talking about across the board.

3 MR. FRAMPTON: Same objection.

4 THE WITNESS: The -- the differences are
5 greater between adult men and women than prepubertal 12:13:14
6 boys and girls, yes.

7 BY MR. BLOCK:

8 Q They're -- they're far greater; correct?

9 A That's a subjective term, but I'll -- I'll
10 say they're greater. 12:13:27

11 Q In fact, the differences is, between
12 cisgender men and cisgender women -- actually --
13 actually, let me -- let me quote the language from
14 your report.

15 Let's go to page 9, paragraph 11 C. 12:13:41

16 Are you there?

17 A I'm there.

18 Q You are?

19 A I -- I am there.

20 Q Yeah. So it says (as read): 12:14:07

21 "Males exhibit large average
22 advantages in size, weight, and
23 physical capacity over
24 females—often falling far outside
25 female ranges." 12:14:15

1 Do you see that?

2 A I do see that.

3 Q Okay. So the differences in things before
4 puberty, do the -- do the size, weight and physical
5 capacity of prepubertal boys fall far outside the -- 12:14:34
6 the range of prepubertal girls?

7 A Well, I would say that the physical capacity
8 of boys consistently is shown to exceed that of
9 girls in many different ways of looking at it, yes.

10 Q It falls far outside the female range? 12:14:52

11 A Male -- males consistently exceed female
12 performance in the preadolescent population in
13 measurements such as upper body strength, speed,
14 etcetera.

15 Q Does it fall outside the female range? 12:15:32

16 MR. FRAMPTON: Objection to form.

17 THE WITNESS: To some degree, when you look
18 at individual records in age-based categories, you
19 would have to say that they do.

20 BY MR. BLOCK: 12:16:10

21 Q Are you thinking of anything in particular?

22 A I'm thinking of categories in, for instance,
23 track and field and weight lifting records.

24 Q There's weight lifting records for
25 prepubertal boys and girls? 12:16:40

1 A There are.

2 Q Like -- like, taking weights and -- and --
3 and doing competition in weight lifting?

4 A There are.

5 Q Where? Where -- where are those records? 12:16:51
6 Are they published anywhere?

7 A I believe they are. I'd have to -- I'd have
8 to find them.

9 MR. FRAMPTON: Josh, we're -- we're over
10 90 minutes. I don't want to cut you off, if you 12:17:17
11 want to finish something, but I think it is an
12 appropriate time for a break sometime in the near
13 future.

14 MR. BLOCK: Yeah, sure, we can take a break.

15 Do you want to come back at -- how much time 12:17:31
16 do you need? Half an hour or 45 minutes?

17 THE VIDEOGRAPHER: Can we go off the record?

18 MR. FRAMPTON: Yeah, let's go off the record.

19 Let's not do lunch at --

20 THE VIDEOGRAPHER: Hold on. Hold on. Hold 12:17:44
21 on.

22 MR. FRAMPTON: Oh, I'm sorry.

23 THE VIDEOGRAPHER: Off the record at

24 12:18 p.m.

25 (Recess.) 12:27:58

1 THE VIDEOGRAPHER: We are on the record at
2 12:28, Central Time.

3 BY MR. BLOCK:

4 Q Dr. Carlson, we've previously discussed that
5 you're not an endocrinologist; right? 12:28:28

6 A Correct. I'm a board-certified sports
7 medicine physician.

8 Q And you're not an expert in transgender
9 medicine; right?

10 A I do not care for -- I do not run a clinic 12:28:40
11 for transgender people, no.

12 Q Do you -- do you have any expertise in -- in
13 the physiological changes that occur to a
14 transgender person's body if they have puberty
15 blockers followed by gender-affirming hormones? 12:29:07

16 MR. FRAMPTON: Object to the form.

17 Go ahead.

18 THE WITNESS: I'm not a board-certified
19 endocrinologist. I know what I know based on review
20 of the literature. 12:29:19

21 BY MR. BLOCK:

22 Q All right. So do you have any expertise to
23 be an expert witness and offer an expert opinion on
24 the physiological changes that occur when a
25 transgender person has puberty blockers followed by 12:29:30

1 gender-affirming hormones?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: As that touches on

4 participation in sports, I am offering an opinion on

5 the safety profile of transgender athletes crossing 12:29:52

6 over into other -- to -- to a cisgender sport that

7 they're -- into cisgender sports.

8 BY MR. BLOCK:

9 Q That wasn't my question.

10 Do you have any expert -- do you have any 12:30:10

11 reasons for offering an expert opinion on what

12 physiological changes occur to a person's body if

13 they have puberty blockers followed by

14 gender-affirming hormones?

15 MR. FRAMPTON: Object to the form. 12:30:25

16 THE WITNESS: If you're asking if I can speak

17 to the one study that I'm aware of that looks at

18 that, then, yes, I -- I suppose I can speak to it.

19 BY MR. BLOCK:

20 Q No. So you're only aware of one study 12:30:43

21 that -- that speaks to the physiological changes

22 that occur when you have puberty blockers followed

23 by gender-affirming hormones?

24 A In -- I've -- I've told you the study that

25 I'm familiar with. 12:31:11

1 Q All right. So -- so you -- you've read a
2 study by Klaver to prepare for this deposition. And
3 other than that, do you have any knowledge of the
4 physiological changes that occur when someone has
5 puberty blockers followed by gender-affirming 12:31:22
6 hormones?

7 A I'm not aware of other studies looking at
8 what you're referencing.

9 Q Do you have any other form of knowledge about
10 it? 12:31:37

11 A About it being the physiologic changes
12 associated with the use of puberty blockers?

13 Q Followed by gender-affirming hormones.

14 A I'm going to be careful what I say here
15 because much of what I've written in that white 12:32:13
16 paper speaks to the effect of gender-affirming
17 hormone therapy. So I want to parse that out from
18 the issue of puberty blocker administration.

19 Q Are you still thinking about it?

20 A I thought I answered the question. 12:33:39

21 Q No, I'm sorry, if you did, it didn't come
22 out. So I -- are you still thinking about it?

23 What -- what was the answer to your
24 question -- to my question?

25 A I said that I want to be careful how I parse 12:33:48

1 that because a lot of my -- the information in my
2 white paper speaks to the impact on athletic
3 performance of gender-affirming hormones, and I want
4 to make sure that you're only speaking to puberty
5 blockers specifically. 12:34:11

6 Q I'm speaking to puberty blockers followed by
7 gender-affirming hormones, which is different from
8 taking gender-affirming hormones after having
9 already undergone puberty.

10 And so my question, do you have any basis of 12:34:24
11 knowledge, other than this paper that you recently
12 read, about the physiological changes that occur
13 when someone has puberty blockers followed by
14 gender-affirming hormones?

15 MR. TRYON: Objection to form. 12:34:42

16 THE WITNESS: That presupposes that, you
17 know, the individuals that have transitioned, you
18 know, in mid adolescence or what have you, weren't
19 on pubertal blockers either.

20 So I don't -- I -- I -- I'm not -- I'm not 12:35:00
21 trying to be evasive. I'm just trying to understand
22 your question. Because what I'm telling you is
23 that -- that I believe that there's basis on -- in
24 the literature that's available to say that
25 individuals that get to the cusp of puberty have -- 12:35:24

1 that there are measurable differences in performance
2 that they bring with them and -- and that those
3 differences are going to, in some way, equate to
4 heightened risk.

5 BY MR. BLOCK: 12:35:42

6 Q And I'm asking you to --

7 A So -- and I get that you're -- you're trying
8 to limit this conversation to the effect of pubertal
9 blockers, and what I'm telling you is that if -- if
10 you're going to -- you can't talk about that in a 12:35:56
11 vacuum. There's other differences once that
12 individual jumps over into sports play with the
13 opposite sex will come into view.

14 Q Do you have any expert basis -- do you have
15 any basis for offering an expert opinion on what 12:36:15
16 physiological differences are carried forward from
17 having puberty blockers followed by gender-affirming
18 hormones other than this article that you read
19 recently?

20 A I don't believe that -- 12:36:31

21 MR. FRAMPTON: Objection --

22 THE WITNESS: -- that there are --

23 MR. FRAMPTON: -- to the form.

24 Go ahead. Go ahead.

25 THE WITNESS: To my knowledge, there are not 12:36:37

1 peer-reviewed studies looking at the effect of
2 puberty blockers on performance. So I don't -- I
3 don't believe that that question can be answered.

4 BY MR. BLOCK:

5 Q So you -- you've made an assertion about 12:36:48
6 physiological differences being carried forward. My
7 question is whether you have any expert basis, of
8 any kind, other than this article that you recently
9 read, to testify about the effects of gen- -- of
10 having puberty blockers followed by gender-affirming 12:37:09
11 hormones on someone's physiology.

12 A You said --

13 MR. TRYON: Objection as to form.

14 THE WITNESS: -- performance.

15 MR. TRYON: Dr. Carlson -- 12:37:22

16 THE WITNESS: You said performance.

17 MR. TRYON: -- please -- Dr. Carlson, can you
18 please just let me object first? Thanks.

19 Objection as to form.

20 Go ahead. 12:37:29

21 THE WITNESS: You're using two different
22 terms. You -- you said performance earlier.

23 BY MR. BLOCK:

24 Q Physiology.

25 Do you have any expert basis of any kind to 12:37:34

1 offer an opinion on what physiological
2 characteristics exist for someone who has had
3 puberty blockers followed by gender-affirming
4 hormones?

5 MR. TRYON: Same objection. 12:37:50

6 MR. FRAMPTON: Same objection.

7 THE WITNESS: My opinion on physiology for
8 puberty-blocking hormones would be limited to that
9 paper, but my opinion with respect to performance, I
10 believe, carries more weight because, to my 12:38:06
11 knowledge, there aren't studies looking at that
12 question.

13 BY MR. BLOCK:

14 Q But you don't have any basis for offering an
15 expert opinion on performance of people who have had 12:38:24
16 puberty blockers followed by gender-affirming
17 hormones either because there's no studies of that;
18 correct?

19 MR. FRAMPTON: Objection --

20 THE WITNESS: It cuts both ways. 12:38:35

21 MR. FRAMPTON: -- to form.

22 BY MR. BLOCK:

23 Q So -- but you don't have a -- fine.

24 But answer my question.

25 You don't have an expert basis for offering 12:38:43

1 an opinion on it one way or another; correct?

2 MR. FRAMPTON: Objection to the form.

3 THE WITNESS: The opinion on safety in

4 athletes who are crossing over into other gender

5 sports takes into account considerations that go 12:38:57

6 well beyond what you're talking about, so I don't --

7 I don't accept the assumptions of the question.

8 BY MR. BLOCK:

9 Q My -- my question was do you have any basis

10 for offering an expert opinion on performance 12:39:19

11 advantages for people who have had puberty blockers

12 followed by gender-affirming hormones since there's

13 no studies of that one way or the other.

14 MR. FRAMPTON: Objection to the form.

15 THE WITNESS: And what I have told you -- 12:39:37

16 Sorry.

17 And what I have told you, I -- I thought,

18 several times, is that those individuals come into

19 puberty carrying categorical distinctions that are

20 sex based that contribute to risk, regardless of 12:39:57

21 whether or not they transition.

22 BY MR. BLOCK:

23 Q But you have no expert basis for saying that

24 they carry it through puberty and transition.

25 You -- you're are offering an opinion about what 12:40:08

1 happens before puberty and transition, but there's
2 no studies at all about, you know, what happens
3 after transition. That's just something that you're
4 saying, but there's no studies about it; correct?

5 A Well, again -- 12:40:21

6 MR. FRAMPTON: Objection to the form.

7 Go ahead and answer.

8 THE WITNESS: Again, I've said many times
9 that there are not published studies looking at
10 performance in the individuals that you're 12:40:33
11 describing once they've transitioned through
12 puberty.

13 BY MR. BLOCK:

14 Q Does sex-determined pubertal skeletal growth
15 and maturation have an effect on -- on the safety of 12:41:34
16 allowing an athlete to compete?

17 A In the assumptions I'm making, it's not key.

18 Q It's not.

19 Well, let's go to -- to page -- I'll come
20 back to it. 12:41:53

21 Do -- does bone length have a -- does bone
22 size have an effect on muscle size?

23 A Does bone size have an effect on muscle size?

24 Q Yes. Does the -- does the size of someone's
25 bones affect how, like, much muscle mass they can 12:42:42

1 put on those bones?

2 A There is an association there.

3 Q It's just an association?

4 A They play against each other. Large muscle
5 mass creates greater bone mineralization too, just 12:43:05
6 from the tug of the muscles on bones. So there's an
7 association, yes.

8 Q Let's go to page? Page 1 of your report.

9 A Which report are we talking about?

10 Q Your -- your February report. 12:43:34

11 A Okay.

12 Q The final sentence of this first paragraph,
13 you say (as read):

14 "And in fact, biologically male
15 transgender athletes have competed 12:43:53
16 in a wide range of high school,
17 collegiate, and professional girls'
18 or women's sports, including, at
19 least, basketball, soccer,
20 volleyball, softball, lacrosse, and 12:44:01
21 even women's tackle football."

22 Correct?

23 A That's what that says.

24 Q Okay. Are you aware of any injuries
25 resulting from their participation in those sports? 12:44:11

1 A I'm not -- I'm not --

2 MR. BLOCK: I think Mr. Carlson froze.

3 THE VIDEOGRAPHER: Yeah, just -- we should
4 pause a sec.

5 (Technical issues.) 12:44:32

6 THE WITNESS: Because it's not adequately --
7 Sorry, I don't know if it's when I go to look
8 at the document or what, but -- can you see me now?

9 BY MR. BLOCK:

10 Q You'll have to answer that again. 12:44:39

11 So are you aware of any injuries that have
12 resulted from the participation of those transgender
13 athletes?

14 A This issue is inadequately tracked, so no,
15 I'm not aware. 12:44:57

16 Q Okay.

17 A Well, actually, that's not true.

18 Rephrase your question. I want to make sure
19 I'm understanding it.

20 Q You wrote that (as read): 12:45:08

21 "In fact, biologically male
22 transgender athletes have competed
23 in a wide range of high school,
24 collegiate, and professional girls'
25 or women's sports, including, at

12:45:15

1 least, basketball, soccer,
2 volleyball, softball, lacrosse, and
3 even women's tackle football."

4 And my question is, are you aware of any
5 injuries that resulted from the participation of 12:45:25
6 transgender girls and women in those sports?

7 A And so my answer would be that's not
8 adequately tracked, and so no, I'm not familiar.

9 Q Are you aware of any evidence that the
10 participation of transgender women in these events 12:45:40
11 actually has increased the frequency and severity of
12 injury suffered by such gender female athletes?

13 A You're speaking to those sports listed?

14 Q Yes.

15 A Again, it's inadequately tracked, so I'm not 12:46:01
16 familiar.

17 Q And let's go to paragraph 47 of that
18 document, the same document. Page 27, paragraph 47.

19 A Page 27, you said?

20 Q Yeah. In paragraph 47, at the bottom. 12:46:29

21 A Okay.

22 Q It says (as read):

23 "In 2014, a male mixed-martial art
24 fighter identifying as female and
25 fighting under the name Fallon Fox 12:46:40

1 fought a woman named Tamikka Brents,
2 and caused significant facial
3 injuries in the course of their
4 bout."

5 And then if you continue going -- this -- 12:46:51
6 this quote that you have in, you know, indentation
7 has a footnote 15.

8 Do you see that?

9 A I do.

10 Q Okay. And the -- the website that that 12:47:04
11 quotes to -- that that footnote goes to is
12 bjj-world.com/transgender.mma-fighter-fallon-fox-
13 breaks-skull-of-her-female-opponent; is that right?

14 A That's what I see, yes.

15 Q Okay. Did Fallon Fox actually break the 12:47:28
16 skull of her opponent?

17 A Well, I don't believe that -- I don't believe
18 that he did, no.

19 Q What -- what -- what --

20 A I didn't make that claim. That's a link to a 12:47:40
21 website page that just references to the event,
22 so...

23 Q Right. So what -- actually, the -- the
24 injury that actually was sustained was an orbital
25 fracture; correct? 12:47:52

1 A Yeah, it was a facial fracture.

2 Q Okay. And do you know how common orbital
3 fractures are in MMA events?

4 A I -- I couldn't give you a specific --
5 incidents, no. 12:48:08

6 Q No.
7 So -- so you don't know the rates of -- of
8 orbital fractures, you know, among cisgender MMA
9 competitors fighting each other; correct?

10 A No, I could give not give you that statistic. 12:48:18
11 I -- I -- I don't recall it.

12 Q Do you know who the plaintiff is in this
13 case?

14 A I -- I do not know who the plaintiff is. I
15 know of -- the initials of the plaintiff. 12:48:44

16 Q Okay. Do you know how old the plaintiff is?

17 A I -- I actually couldn't tell you that.

18 Q Okay. Do you know what sports the plaintiff
19 plays?

20 A I believe the plaintiff is a runner, but I'm 12:48:53
21 not sure.

22 Q Do you know how the plain- -- do you know how
23 the plaintiff has scored in physical fitness tests?

24 A No. I have no idea about the specifics of
25 this case. 12:49:11

1 Q Okay. Do you know if, you know, whatever
2 things you were referring to before, about, you
3 know, skills, you know, acquired of preper --
4 prepubertal boys, do you -- do you know anything
5 about whether the plaintiff, you know, has any of 12:49:26
6 those skills?

7 A I don't. And I believe that -- I told you
8 that I -- I don't -- I'm not familiar with the
9 particulars of your plaintiff. And to the extent
10 that -- you know, this -- this is a -- I'm familiar 12:49:45
11 with the -- I -- I'm under the impression that the
12 law that's being challenged -- I'm -- I'm not
13 familiar with the particulars of this case.

14 Q Do you know how much lean body mass the
15 plaintiff has? 12:50:10

16 A I do not know how much lean body mass the
17 plaintiff has.

18 Q Do you know if the plaintiff in this case has
19 any physiological characteristics that would impact
20 safety that are different than the physiological 12:50:25
21 characteristics of a cisgender girl?

22 A I do not.

23 MR. FRAMPTON: Object to the form.

24 BY MR. BLOCK:

25 Q Sorry, could -- could I hear the answer -- 12:50:36

1 MR. FRAMPTON: That was probably garbled, but
2 I object to the form.

3 Go ahead and answer the question.

4 THE WITNESS: I do not.

5 BY MR. BLOCK: 12:50:44

6 Q Do you know whether the participation of this
7 plaintiff in sports would pose any more of a safety
8 risk than the participation of any other cisgender
9 girl in sports?

10 MR. FRAMPTON: Object to the form. 12:51:02

11 THE WITNESS: Because I don't know the
12 particulars of this person, I certainly could not
13 speak to that.

14 BY MR. BLOCK:

15 Q Are you providing an -- expert testimony at 12:51:15
16 all regarding safety risks from cross-country?

17 A I was asked to provide a report on safety
18 risks as relates to participation in -- of athletes
19 in contact in collision sports, but that's
20 defined -- the -- the nature of that is defined 12:51:42
21 within my paper.

22 Q Okay. So it does not -- so contact and
23 collision sports does not include cross-country;
24 correct?

25 A That's correct. 12:51:52

1 Q And contact and collision sports doesn't
2 include track and field; correct?

3 A Correct.

4 Q Okay. Do you -- would it be fair to say that
5 the effects of male-to-female hormones on important 12:52:27
6 determinants of athletic performance still remain
7 largely unknown?

8 A I -- I -- I didn't hear -- the effects of
9 male and female hormones on what?

10 Q On determinants of athletic performance 12:52:42
11 remain largely unknown.

12 MR. FRAMPTON: Object to the form.

13 Go ahead.

14 THE WITNESS: What do you mean by "largely
15 unknown"? 12:52:52

16 BY MR. BLOCK:

17 Q I don't know. Do you think it's a fair
18 statement, that they remain largely unknown?

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: I think that there's good 12:53:04
21 evidence that testosterone has a significant impact
22 on performance.

23 BY MR. BLOCK:

24 Q But do you think the effects of lowering
25 circulating testosterone on athletic performance 12:53:17

1 remains largely unknown?

2 MR. FRAMPTON: Same objection.

3 THE WITNESS: I wouldn't say largely unknown.

4 I'd say it's evolving and we've learned a lot over

5 the last few years. 12:53:33

6 BY MR. BLOCK:

7 Q Has there been any controlled research

8 evaluating how lowering circulating testosterone

9 influences aerobic or resistance training?

10 A There is -- there is a study on Air Force 12:53:45

11 cadets answering that question.

12 Q Has there been any study of the effects of

13 lowering circulating testosterone on bench presses

14 or leg presses or squats or dead lifts?

15 MR. FRAMPTON: Object to form. 12:54:20

16 THE WITNESS: I believe that those studies --

17 there are studies looking at the effect of

18 testosterone on things like punching power and...

19 BY MR. BLOCK:

20 Q Anything else? 12:54:56

21 A There -- there are -- there are studies

22 looking at -- I'm sorry, say the question one more

23 time.

24 Q Sure. Are there studies looking at the

25 effects of lowering circulating testosterone on 12:55:12

1 muscle strength in standard lifts, like bench press,
2 leg press, squats, dead lifts?

3 MR. FRAMPTON: Objection to the form.

4 Go ahead.

5 THE WITNESS: I believe that there are 12:55:29
6 studies looking at the effect of testosterone
7 reduction on...

8 BY MR. BLOCK:

9 Q I'm sorry, did you finish answering the
10 question? 12:56:09

11 A Are you talking about in transgender
12 athletes, or are you talking about transgender
13 individuals as a whole?

14 Q Either one.

15 A There -- there are -- there are studies 12:56:28
16 looking at the effect of transition on loss of
17 muscle mass, and there are studies looking at
18 proxies for upper body strength, like grip strength,
19 and there are studies looking at proxies for
20 punching power. 12:56:57

21 Q But their -- their studies are looking at
22 proxies for those things as opposed to measuring
23 muscle -- muscle strength, you know, through bench
24 presses, leg presses, squats or other traditional
25 measurements of strength; correct? 12:57:14

1 MR. FRAMPTON: Objection to the form.

2 THE WITNESS: Well, you -- I mean, you -- you
3 began this by speaking of -- well, I told you that
4 there was a study on Air Force cadets and part of
5 that was push-up. So that's a -- and -- and these 12:57:26
6 are -- these proxies are accepted proxies for what
7 we're talking about, so...

8 BY MR. BLOCK:

9 Q So I -- just the answer to my question --

10 A The answer to your question is -- is that 12:57:41
11 there have been studies looking at the effect of
12 testosterone suppression in transgender individuals
13 on measures of strength and power, lean mass.

14 Q On -- on proxies for those things; correct?

15 A Yes. Accepted proxies. Noncontroversial 12:58:03
16 proxies.

17 Q So in -- let's look at paragraph 90 of your
18 report.

19 A Okay.

20 Q Paragraph 90 says (as read): 12:58:43

21 "In addition, multiple studies have
22 found that testosterone suppression
23 may modestly reduce, but not does
24 not come close to eliminating the
25 male advantage in muscle mass and 12:58:56

1 lean body mass, which together
2 contribute to the greater average
3 male weight. Researches looking at
4 transitioning adolescents found that
5 the weight of biological male 12:59:05
6 subjects increased rather than
7 decreased after treatment with an
8 antiandrogen testosterone
9 suppressor."

10 Did I read that right? 12:59:15

11 A Yes.

12 Q Okay. So -- and then you cite to a study by
13 Tack in 2018; correct?

14 A Correct.

15 Q Okay. So did the Tack study find that after 12:59:30
16 taking antiandrogen testosterone suppressor, the
17 transgender subjects's muscle mass and lean body
18 mass increased?

19 A I believe that the Tack study looked at
20 several things, one of which was grip strength, and 12:59:58
21 found that grip strength did not decrease.

22 Q So that's not my question. My question is,
23 did the Tack study find that muscle mass and lean
24 body mass increased?

25 A I believe that muscle mass helps stabl- -- 01:00:18

1 I'd have to go back and look at that.

2 Can I see my report?

3 Q Your report is there --

4 A I'm sorry, I -- I'd have to go back and --

5 and -- and reference that, but -- 01:00:42

6 Q Okay. Well --

7 A I can't recall.

8 Q Okay. So this first sentence in paragraph 90
9 talks about how testosterone suppression doesn't
10 come close to eliminating the male advantage in 01:00:52
11 muscle mass and lean body mass; correct?

12 That's what the first sentence talks about?

13 A Correct.

14 Q All right. And the second sentence says that
15 the Tack study found that the weight of biological 01:01:06
16 male subjects increased rather than decreased;
17 correct?

18 A Correct.

19 Q So is it a fair inference from the first
20 sentence, followed by the second sentence, that 01:01:21
21 you're implying here that what increases was muscle
22 mass and lean body mass?

23 MR. FRAMPTON: Objection --

24 THE WITNESS: No --

25 MR. FRAMPTON: -- to the form. 01:01:32

1 Go ahead.

2 THE WITNESS: No, I'm not trying to imply
3 that.

4 BY MR. BLOCK:

5 Q You're not trying to imply that. 01:01:38

6 So then why is it relevant that the weight
7 increased?

8 A Well, lean body mass -- where lean body mass
9 settles is relevant. That's one thing. But overall
10 weight of the individual, again, within an injury 01:01:58
11 model, matters, too.

12 Q Sure. But in this paragraph -- so the first
13 sentence discusses muscle mass and lean body mass;
14 correct?

15 A Correct. 01:02:11

16 Q And then the second sentence mentions the
17 Tack study; correct?

18 A Well, I -- I would say that the first
19 sentence speaks to the advantage in muscle mass and
20 lean body mass, and then it references to average 01:02:24
21 male weight. So all three are referenced there.

22 Q Okay. And the second sentence talks about
23 the Tack study; correct?

24 A Correct.

25 Q And then the third sentence talks about a 01:02:35

1 Harper study and talks about their lean body mass
2 and muscle area; correct?

3 A That -- that is a -- the Harper references to
4 a -- a review paper.

5 Q Okay. But the -- 01:03:03

6 A So -- yeah, so I'd have to go back and look
7 at that review paper to see what the original
8 citation is that that's referencing.

9 Q Sure. But in your paragraph 90, the first
10 sentence, the third sentence and the fourth sentence 01:03:23
11 refer to muscle mass or muscle area or lean body
12 mass; right?

13 MR. FRAMPTON: Objection to the form.

14 Go ahead.

15 THE WITNESS: Which sentences again? 01:03:41

16 BY MR. BLOCK:

17 Q The first, the third and the fourth.

18 A The first sentence refers to muscle mass,
19 lean body mass and -- and average weight. The third
20 references lean body mass and muscle area. 01:04:01

21 And you said the fourth?

22 Q Yep.

23 A References muscle area.

24 Q Do any of those sentences reference fat?

25 A Well, they do indirectly, when you're 01:04:27

1 referring to lean body mass and shifts in lean body
2 mass.

3 Q Do they do -- do they do directly, reference
4 fat?

5 MR. FRAMPTON: Object to the form. 01:04:47
6 Go ahead.

7 THE WITNESS: They do not directly. They do
8 indirectly.

9 MR. BLOCK: So if you look in your exhibit
10 folder, I'm going to mark this Exhibit 83. It 01:04:56
11 should soon appear.

12 (Exhibit 83 was marked for identification
13 by the court reporter and is attached hereto.)

14 BY MR. BLOCK:

15 Q Let me know when it's up. 01:05:16

16 A It's up. I'm just looking to see if I can
17 zoom this. Right here.

18 Okay.

19 Q Is -- is this the Tack study that you're
20 referring to? 01:05:37

21 A Yes.

22 Q Okay. If you can turn to page 2151 of the
23 study.

24 A Okay.

25 Q Okay. If you look in the second -- in the 01:06:07

1 right column, you know, the first full paragraph,
2 it -- it says (as read):

3 "Trans girls treated with CA showed
4 a significant increase in fat mass
5 (Figure 1D) and decrease in lean 01:06:22
6 mass (Figure 1C), resulting in an
7 increased body fat percentage,
8 without changes in total mass."

9 Did I read that right?

10 A Yes. 01:06:34

11 Q Okay. So according to the summary, was there
12 actually an increase in -- in total mass for these
13 trans girls?

14 MR. FRAMPTON: Object to the form.

15 Go ahead. 01:07:04

16 THE WITNESS: Can I have a minute to look at
17 this paper?

18 BY MR. BLOCK:

19 Q Yeah, sure.

20 A Thanks. 01:07:17

21 Reference weight before hormonal therapy
22 averaged 63.7 kilograms; afterwards, averaged
23 66.3 kilograms.

24 Q So what do you interpret to be the -- what --
25 what do you think -- what do you interpret the 01:08:34

1 sentence we just read to refer to when it says

2 "without changes in total mass"?

3 A That's speaking to a shift in -- you -- you
4 are correct that there is no change in body weight
5 associated with that statement.

01:09:21

6 Q Okay. And so this -- did this study find
7 that -- that muscle mass in the transgender girls
8 actually increased?

9 A Well, one of the -- the changes in lean body
10 mass in this study were negative.

01:10:36

11 Q Okay. The study --

12 A But we don't know where they settled compared
13 to a cisgender population because it wasn't
14 analyzed.

15 Q Okay.

01:10:51

16 A We do know that grip strength didn't change.

17 Q How -- is increase in fat generally
18 associated with enhanced athletic performance?

19 A In the conte- -- it can be with -- as a --
20 energy stored, but in the context of this, no.

01:11:24

21 Q Okay. On grip strength -- let's look further
22 down in that paragraph we were reading from, on page
23 2151.

24 A Uh-huh.

25 Q So this is the -- the beginning of the final

01:11:38

1 sentence.

2 Do you see that?

3 A Yes, I do.

4 Q So it says (as read):

5 No significant changes in grip 01:11:47

6 strength were observed in trans

7 girls during the study period,

8 resulting in decreased Z scores

9 compared with the -- compared with

10 age-matched peers of the same gender 01:11:57

11 recorded at birth.

12 Do you see that?

13 A I do.

14 Q What does that mean, by negative Z scores?

15 A That's a comparison of your score to 01:12:04

16 age-matched norms.

17 Q Okay. So in -- in context, does this mean

18 that compared to -- that the cisgender boys that

19 these subjects are being compared to continue to

20 increase their grip strength while the grip strength 01:12:27

21 of the transgender girls remained flat?

22 A Yes, that's accurate.

23 Q Okay. So the -- the use -- suppressing

24 testosterone had an effect on the ability to

25 increase grip strength; correct? 01:12:47

1 MR. FRAMPTON: Object to the form.

2 THE WITNESS: In this case, yes.

3 BY MR. BLOCK:

4 Q Okay. If we can go to page 55, bottom of

5 paragraph 95. 01:13:13

6 A Are we back on my report?

7 Q Yeah, we are. Thanks.

8 A Page 55, paragraph what?

9 Q 95. So the -- the -- the bottom half of the
10 paragraph that's, you know, continuing. 01:13:37

11 A Okay.

12 Q So -- so let's go just from the middle of
13 that paragraph.

14 Do you see "the important point to make"? Do
15 you see where you write that? 01:13:53

16 A I do.

17 Q Okay. So you write (as read):

18 "The important point to make is that
19 the only effect strength training
20 could have on these athletes is to 01:13:59

21 counteract and reduce the limited
22 loss of muscle mass and strength
23 that does otherwise occur to some
24 extent over time with testosterone
25 blockade. There has been at least 01:14:10

1 one study that illustrates this,
2 although only over a short period,
3 measuring strength during a
4 twelve-week period where
5 testosterone was suppressed to 01:14:19
6 levels of 2 nmol/L. During that
7 time, subjects actually increased
8 leg lean mass by 4% and total lean
9 mass by 2%, and subject performance
10 on the 10 rep max leg press improved 01:14:31
11 by 32%, while their bench press
12 performance improved by 17%."

13 And you cite to -- to Kvorning, K-V-O-R-N-I
14 N-G, 2006; right?

15 A Correct. 01:14:47

16 Q Okay. So do you -- do you recall what this
17 study -- this Kvorning study was analyzing?

18 A I believe that it was analyzing
19 non-transgender subjects who were -- (technical
20 difficulty). 01:15:18

21 MR. FRAMPTON: Sorry, he did answer --

22 THE WITNESS: Did you hear me?

23 MR. FRAMPTON: -- the question. Did it not
24 come through?

25 MR. BLOCK: It didn't come through. 01:15:22

1 MR. FRAMPTON: I'm sorry.

2 Answer it again.

3 THE WITNESS: I -- I said I believed that it
4 refers to non-transgender subjects who underwent
5 hormonal suppression. 01:15:30

6 BY MR. BLOCK:

7 Q Okay. And are -- does it -- are those
8 non-tran- -- are those non-transgender subjects
9 compared to a -- a different group, a control group
10 of any kind? 01:15:39

11 A I -- I don't recall. I'd have to go back and
12 look.

13 Q Okay. Let's do that. I -- I have it already
14 for you.

15 MR. FRAMPTON: Sorry, I'm just going to tilt 01:15:59
16 his screen a little bit. It looks like his chin is
17 getting cut off. I can't tell if that's just on my
18 screen or -- or not.

19 MR. BLOCK: No, it's -- it's on -- it's on
20 mine, too. 01:16:09

21 MR. FRAMPTON: Okay.

22 MR. BLOCK: Thank you.

23 (Exhibit 84 was marked for identification
24 by the court reporter and is attached hereto.)

25 MR. BLOCK: So popping up in your exhibit 01:16:16

1 files should be a -- a document marked Exhibit 84.

2 THE WITNESS: Okay.

3 BY MR. BLOCK:

4 Q Let me know when it's there.

5 A I have it. 01:16:36

6 Q Okay. Okay. And so this document is titled

7 "Suppression of endogenous testosterone production

8 attenuates the response to strength training: a

9 randomized, placebo-controlled, and blinded

10 intervention study." 01:16:55

11 Did I read that right?

12 A You did.

13 Q And this is the study you were citing to;

14 correct?

15 A Correct. 01:17:01

16 Q And, you know, randomized,

17 placebo-controlled, and blinded is pretty much

18 the -- the best a study can be, right? That's, you

19 know, the gold standard, isn't it?

20 MR. FRAMPTON: Object to the form. 01:17:11

21 Go ahead.

22 THE WITNESS: Well, yeah, double blinded

23 would be the gold standard, but yes.

24 BY MR. BLOCK:

25 Q Good point. 01:17:18

1 And so just reading from the -- the abstract
2 a little bit, if you go, you know, five lines down
3 from the abstract, it says (as read):

4 "We hypothesized that suppression of
5 endogenous testosterone would 01:17:31
6 inhibit the adaptations to strength
7 training in otherwise healthy men."

8 Right?

9 A Right.

10 Q And so tell me if my description of what 01:17:47
11 happened is right. You know, they -- they took two
12 groups of, you know, cisgender men, and for one
13 group, they suppressed their testosterone, and then
14 they had both groups undergo a strength-training
15 period of eight weeks; is that right? 01:18:07

16 A Correct.

17 Q Okay. And then they compared the two groups;
18 right?

19 Is that right?

20 A I -- I want to make sure I'm answering you 01:18:27
21 correctly, so give me a minute.

22 Q Fair. I just wanted to make sure.

23 A Yeah, so -- just so that I'm clear, can you
24 restate your question again?

25 Q Yeah. So, you know, after having the two 01:19:14

1 groups undergo this period of strength training,
2 they then compared the results of the two groups;
3 right?

4 A Yes.

5 Q Okay. If we can just look at -- if we can 01:19:29
6 just look at page E1329. Let me know when you're
7 there.

8 A Go ahead.

9 Q Okay. So if you look at the paragraph
10 beginning -- so the final paragraph on this page, on 01:20:08
11 1329, it says (as read):

12 "The placebo group adapted to the
13 strength training period by
14 significantly larger increases in
15 both lean leg mass and isometric 01:20:18
16 strength. Although those in the
17 goserelin group were able to have
18 the same progression in training
19 load as those in the placebo group,
20 they did not gain muscle mass or 01:20:31
21 increased isometric strength in the
22 laboratory test."

23 Right?

24 A That's what that says.

25 Q Okay. And then if we can just go to the -- 01:20:38

1 well, let's just -- I'll ask you questions about
2 that.

3 So the -- the -- tell me if I'm wrong about
4 this, but the study, you know, seems to support an
5 argument that reducing circulating testosterone 01:20:55
6 affects a biological male's ability to increase
7 muscle mass and strength. Is that a fair -- in
8 response to training. Is that a fair statement?

9 MR. FRAMPTON: Object to the form.

10 Go ahead. 01:21:18

11 THE WITNESS: I would say that it -- it does
12 show that the effects -- that it does affect the
13 ability to improve strength training, yes.

14 BY MR. BLOCK:

15 Q And so when -- when athletes -- 01:21:33

16 A I would say affects, not eliminate, but...

17 Q Okay. When -- when athletes train for
18 athletic competitions, they engage in new strength
19 training; right?

20 A Depending on the sport, yes. 01:21:55

21 Q Okay. So is it -- so -- yeah, I understand
22 that -- you know, that your report talks about the
23 ability of suppressing testosterone to reduce muscle
24 and strength that's already been acquired, but does
25 your report address the effects of lowering 01:22:17

1 testosterone on the ability of someone to build new
2 strength and muscle?

3 MR. FRAMPTON: Object to the form.

4 THE WITNESS: Yeah, can I go back to my

5 report to answer that? 01:22:32

6 BY MR. BLOCK:

7 Q Yes, sure.

8 A I'm back on page 55, if you want to go there.

9 Q Of your report?

10 A Yes. Where -- where you started. 01:23:02

11 Q Yeah.

12 A So -- and I'm sorry, restate your question
13 one more time.

14 Q Sure. Does your report address the effects
15 of suppressing testosterone on an -- on an athlete's 01:23:16
16 ability to -- to acquire new increases in mass and
17 strength?

18 MR. FRAMPTON: Objection to the form.

19 Go ahead.

20 THE WITNESS: I think it speaks to it here. 01:23:31

21 It doesn't speak to the degree to which it affects
22 it, but it -- what this study says is that gains are
23 feasible.

24 BY MR. BLOCK:

25 Q Sure. Does -- does this study compare the 01:23:46

1 amount of gains that a cisgender man who's lowered
2 testosterone would have to the gains that a
3 cisgender woman would have?

4 A No, the study looked at men.

5 Q All right. So we -- we don't really have a 01:24:04
6 basis to -- to know one way or the other whether a
7 cisgender woman receiving the same strength training
8 would have increases in -- in muscle mass that are
9 greater or less than the increases that the
10 cisgender men who lowered testosterone had; right? 01:24:27

11 A Well, I think what's relevant to the
12 discussion is that a cisgender male can enter into a
13 strength training program at the time that hormonal
14 therapy has started.

15 That male, in many cases, will already have 01:24:43
16 retained differences in lean muscle mass and
17 strength when comparing to a cisgender female
18 population.

19 And rather than come in -- (technical
20 difficulty) -- they have the capability of coming in 01:24:58
21 higher.

22 So I think that's the relevant comparison.

23 Q And you said in many cases they would have
24 muscle mass that's greater than the cisgender
25 female, but if they don't already have that muscle 01:25:06

1 mass, then they will have a harder time acquiring it
2 than they otherwise would have had; right?

3 MR. FRAMPTON: Objection --

4 THE WITNESS: I didn't say that.

5 MR. FRAMPTON: -- to the form. 01:25:20

6 Go ahead.

7 BY MR. BLOCK:

8 Q I'm saying that. I'm asking that.

9 You know, you said that in many cases, a -- a
10 cisgen- -- a transgender girl will have entered into 01:25:27
11 a tournament already having acquired certain muscle
12 mass.

13 And so my question is about, you know, people
14 who lowered testosterone, you know, before, you
15 know, acquiring any muscle mass and the effects that 01:25:48
16 lowering testosterone would have on their ability to
17 acquire it.

18 A That doesn't --

19 MR. FRAMPTON: Objection to the form.

20 THE WITNESS: -- have anything to do with 01:25:59
21 what we're talking about. We're talking about --
22 you brought up the issue of whether or not
23 individuals who enter into a strength-training
24 program at the time that they are starting hormonal
25 therapy gain ground or not. 01:26:12

1 And that study showed that -- that you can
2 gain ground, and it was done in a male population,
3 the applicably of -- applicability of which, to this
4 conversation, is that those males can then, in turn,
5 cross over into a female sport when they now have 01:26:27
6 greater lean muscle mass than they had before they
7 started, and they already had a retained advantage.

8 I'm not sure --

9 BY MR. BLOCK:

10 Q The study is about cisgender men who have 01:26:44
11 already completed puberty; right?

12 A Again, I would have to go back and look at
13 the age range of the study, but I believe that
14 that's true.

15 Q All right. So transgender girls who 01:26:55
16 transition before completing puberty will not have
17 the same amount of muscle mass as a cisgender man
18 who has completed puberty; right?

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: Say -- say that one more time. 01:27:14

21 BY MR. BLOCK:

22 Q Do people --

23 A Transgender girls who have not -- what did
24 you say?

25 Q Who have not completed puberty do not have 01:27:20

1 the same amount of muscle mass as cisgender men who
2 have completed puberty; right?

3 A I'll grant you that. Yes, that's true.

4 Q Okay. So lowering testosterone, according to
5 the study, has an effect on their ability to 01:27:34
6 accumulate new muscle mass; right?

7 A Well, you -- you left that study. We're no
8 longer talking about that study. I can't speak to
9 the applicability of that study on the scenario that
10 you just gave. They're two different things. 01:27:53

11 Q Okay. So you -- you can't -- you can't speak
12 to the applicability of studies on the effects of
13 lowering circulating testos- -- circulating
14 testosterone on transgender girls who have not
15 completed puberty? 01:28:07

16 A That's not what I said. I said I can't speak
17 to the applicability of the study you raised to the
18 scenario that you then went to.

19 Q Why not?

20 A Because this study is looking at the effects 01:28:17
21 of strength training in men who are transitioning.

22 Q So why is it relevant to this report?

23 A This report, what do you mean?

24 MR. FRAMPTON: Object to the form.

25 ///

1 BY MR. BLOCK:

2 Q I mean, you're -- you're discussing the study
3 because it has -- you think it has some relevance to
4 the participation of transgender women; right?

5 A Yes. I spoke to that already. 01:28:52

6 Q Okay. Do you think it has relevance only to
7 the participation of transgender women who have
8 completed puberty, or does it also have relevance to
9 the participation of transgender women who received
10 puberty blockers or hormones before completing 01:29:04
11 puberty?

12 MR. FRAMPTON: Object to the form.

13 THE WITNESS: The -- the study wasn't
14 designed to look to that group, so I have no way to
15 speak to that. And that study hasn't -- and that 01:29:16
16 has not been looked at.

17 BY MR. BLOCK:

18 Q So -- so you don't think it's relevant to the
19 participation of transgender girls and women who
20 have not completed puberty; right? 01:29:24

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: I didn't say that. You did.

23 BY MR. BLOCK:

24 Q So -- so is it -- is it relevant or isn't it,
25 to -- to girls -- participation of girls and women 01:29:32

1 who are transgender who have not completed puberty?

2 A So --

3 MR. FRAMPTON: Same objection.

4 THE WITNESS: -- I'm a little bit

5 uncomfortable with the assumptions that I've got to 01:29:43

6 make to answer that question, but to step out of

7 what you're saying and say in theory, is this study

8 applicable to prepubertal kids who are entered into

9 a strength-training program at the time that they

10 start hormonal manipulation, possibly. 01:30:03

11 MR. FRAMPTON: We're at -- we're at 1:30

12 here. I think that we probably would like to do a

13 lunch break sometime soon, but I'm not -- I'm not

14 telling you you've got to do that now, by any

15 stretch, if you were trying to complete a line of 01:30:28

16 questioning or something.

17 MR. BLOCK: Yeah -- yeah, I would. Just give

18 me ten more minutes, and then we can take a break.

19 MR. FRAMPTON: Yeah.

20 MR. BLOCK: Is that okay with you, 01:30:40

21 Dr. Carlson?

22 THE WITNESS: Yeah, that's fine.

23 Can I have 30 seconds just to pop some food

24 in my mouth? Is that all right?

25 MR. BLOCK: Sure. Can we go off the record 01:30:49

1 for 30 seconds?

2 THE VIDEOGRAPHER: We are off the record at
3 1:31 p.m.

4 (Recess.)

5 THE VIDEOGRAPHER: We are on the record at 01:31:34
6 1:32 p.m.

7 MR. BLOCK: Great. Thank you.

8 THE VIDEOGRAPHER: Central Time. Sorry,
9 Central Time.

10 BY MR. BLOCK: 01:31:57

11 Q If you go to page 54, near the end of
12 paragraph 93.

13 A Back on my report?

14 Q Yeah.

15 A 54, paragraph what? 01:32:13

16 Q 93. So at the very end, paragraph 93.

17 When you're discussing this Lapauw 2008 and
18 Hilton 2021 study, you say -- this is like five
19 paragraphs from the bottom -- (as read):

20 "The authors also noted that since 01:32:32

21 males who identify as women often
22 have lower baseline (i.e., before
23 hormone treatment) muscle mass than
24 the general population of males..."

25 And then it continues, but I -- 01:32:44

1 A Sorry, I was -- I was trying to find my place
2 when you started reading, so I'm -- I'm on that page
3 now.

4 Q Sure. Do you -- okay.

5 So about five lines from the bottom of 01:32:53
6 paragraph 93, you say -- in -- when discussing this
7 Hilton study, you say (as read):

8 "The authors also noted that since
9 males who identify as women often
10 have lower baseline (i.e., before 01:33:09
11 hormone treatment) muscle mass than
12 the general population of males..."

13 And then the sentence continues, but I just
14 want to ask you a question about this part where you
15 say that the authors of the study noted that males 01:33:23
16 who identify as women often have lower baseline
17 muscle mass than the general population of males.

18 So do you -- do you have any reason to
19 disagree with them, that -- that transgender women
20 often have lower baseline muscle mass than the 01:33:44
21 population of cisgender males?

22 A No. I think there are -- a fair read of
23 studies that do exist says that in many cases
24 transgender -- I'm going to use your term --
25 transgender females come into baseline with some 01:34:03

1 lower measures of lean muscle mass and -- but the
2 relevant -- and so the relevant question is where do
3 they fall related to cisgender females, but to your
4 point.

5 Q So the -- so my -- so my question is, do -- 01:34:25
6 so by lowering their levels of circulating
7 testosterone, that would affect their ability to
8 acquire new muscle mass like at the same rate as a
9 cisgender male; correct?

10 MR. FRAMPTON: Objection to the form. 01:34:48

11 THE WITNESS: Their -- their ability to
12 acquire lean muscle mass at the same rate as a
13 representative cisgender male population would be --
14 studies show that it would show less, yes.

15 Is that what you were asking? 01:35:18

16 BY MR. BLOCK:

17 Q Yeah, I was asking whether or not lowering
18 their circulating testosterone would impair their
19 ability to increa- -- to develop new muscle mass at
20 the same rate as a cisgender male who is -- has 01:35:29
21 regular levels of circulating testosterone.

22 A At the same rate, yes.

23 Q And do you know how -- whether -- do you know
24 what the effects of lowering testosterone has on
25 a -- a transgender woman's ability to acquire new 01:35:48

1 muscle mass compared to how quickly a cisgender
2 woman can acquire new muscle mass?

3 MR. FRAMPTON: Object to the form.

4 Go ahead.

5 THE WITNESS: Restate that question. 01:36:06

6 BY MR. BLOCK:

7 Q Yeah, sure. So I -- do you -- do you -- are
8 you aware of any data comparing the ability of a
9 transgender woman who's lowered circulating
10 testosterone to acquire new muscle mass against the 01:36:20
11 ability of a cisgender woman to acquire new muscle
12 mass?

13 MR. FRAMPTON: Same objection.

14 Go ahead and answer.

15 THE WITNESS: This comparison to cisgender 01:36:30
16 women, trying to think of a specific study. Wiik.

17 I'd have to look at -- I'd have to go back
18 and look at my references.

19 Q Sure.

20 MR. BLOCK: Okay. We can take a break for -- 01:37:07
21 for lunch now. Let's go off the record.

22 THE VIDEOGRAPHER: We are off the record at
23 1:37 p.m., Central Time.

24 (Lunch recess.)

25 THE VIDEOGRAPHER: We are on the record at 02:15:44

1 2:16 p.m., Central Time.

2 BY MR. BLOCK:

3 Q Good afternoon, Dr. Carlson.

4 A Hello.

5 Q I'd like to direct your attention to 02:15:54
6 Exhibit 80, so your February 2022 report, on
7 page 15. Let me know when you're there.

8 A Okay. I am on page 15.

9 Q Okay. And if you can look at footnote 10.

10 A Okay. 02:16:38

11 Q Are you there?

12 A I -- I said, "Okay." I'm sorry.

13 Q Okay. So in the footnote, you know, it says
14 (as read):

15 In some cases, safety requires even 02:16:49

16 further division or exclusion. A

17 welterweight boxer would not compete

18 against a heavyweight, nor a

19 heavyweight wrestle against

20 smaller -- a smaller athlete. In 02:16:59

21 the case of youth sports, when

22 children are at an age where growth

23 rates can vary widely, leagues will

24 accommodate for naturally-occurring

25 large discrepancies in body size by 02:17:10

1 limiting larger athletes from
2 playing positions where their size
3 and strength is likely to result in
4 injury to smaller players. Thus, in
5 youth football, players exceeding a 02:17:21
6 certain weight threshold may be
7 temporarily restricted to playing on
8 the line and disallowed from
9 carrying the ball, or playing in the
10 defensive secondary, where they 02:17:32
11 could impose high-velocity hits on
12 smaller players.

13 Did I read that correctly?

14 A Yes, you did.

15 Q Okay. Great. So, you know -- so my question 02:17:39
16 is, this is an example of a way to improve safety
17 even within a team solely consisting of boys or
18 solely consisting of girls; correct?

19 A Correct.

20 Q Okay. 02:18:09

21 A I mean, it doesn't all speak to team sports,
22 but yes.

23 Q Okay. Now, would this also be a way to
24 increase safety in a coed team?

25 A That does occur in some coed rec sports, yes. 02:18:18

1 Q Okay. So there are ways to make rule
2 modifications to account for safety concerns without
3 completely excluding certain members of the team?

4 MR. FRAMPTON: Object to the form.

5 THE WITNESS: The way that you -- the -- the 02:18:35
6 type of changes that we're talking about can be
7 made, but they alter the nature of the sport itself,
8 so... You -- you cannot do it without changing the
9 essence of what the sport is.

10 BY MR. BLOCK: 02:19:07

11 Q So if --

12 A Whether that's acceptable or not acceptable,
13 that's not really what I was retained for.

14 Q Okay. So if we could go to paragraph 42.

15 A Okay. 02:19:35

16 Q All right. So if you go to the second
17 sentence, where it says "this is one reason."

18 Do you see that?

19 A I'm reading the first, so just give me a
20 second. 02:19:47

21 I see it.

22 Q Okay. So you see "This is one reason that
23 rule modifications often exist in leagues where coed
24 participation occurs." And then for footnote 14,
25 you say, "For example, see" this website "(detailing 02:20:08

1 variety of rule modifications applied in co-ed
2 basketball)." And then you say, "Similarly, coed
3 soccer leagues often prohibit so-called 'slide
4 tackles,' which are not prohibited in either men's
5 or women's soccer." 02:20:28

6 Do you see those sentences?

7 A I do.

8 Q Okay. And so, again, would it be possible to
9 make similar rule modifications if a transgender
10 participant is playing? 02:20:39

11 MR. FRAMPTON: Object to the form.

12 Go ahead.

13 THE WITNESS: Can -- you can change a
14 sport -- you can change the rules of the sport any
15 way you want, but you can't do that without changing 02:20:50
16 the essence of the sport.

17 BY MR. BLOCK:

18 Q Okay. But are these rule changes for these
19 coed participation sports adequate, in your opinion,
20 to minimize safety concerns? 02:21:05

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: I'm not sure I can speak to
23 adequate or not. That implies that safety
24 guardrails can -- that there's an end to it, but --
25 restate your question, I'm sorry. 02:21:36

1 BY MR. BLOCK:

2 Q I said, are these rule changes that you
3 discuss in footnote 14, in your opinion, adequate --
4 adequate to minimize safety risks from coed
5 participation? 02:21:54

6 MR. FRAMPTON: Object to the form.

7 THE WITNESS: I believe that they -- I -- I
8 would assume that in the leagues that use them, that
9 they serve the purpose of risk reduction in those
10 leagues. Not total risk reduction, relative risk 02:22:36
11 reduction.

12 BY MR. BLOCK:

13 Q Is it ever possible to totally eliminate risk
14 from participating in contact or collision sports?

15 A No, of course not. 02:22:45

16 Q But --

17 A Well, yes. By not playing.

18 Q Okay. So -- but -- so do you think sports
19 should be eliminated to eliminate the possibility of
20 risk? 02:23:01

21 MR. FRAMPTON: Object to the form.

22 THE WITNESS: Well, that's -- that's a
23 societal -- that's not why I was retained for this.
24 I was retained to speak to safety issues as exist in
25 sport, not whether a sport ought to continue. 02:23:20

1 BY MR. BLOCK:

2 Q What -- do you think there's safety risks
3 involved when a -- a cisgender high school girl
4 competes at -- competes on a football team with
5 cisgender boys? 02:23:46

6 A Do I think that there are risks? Is that
7 what you said?

8 Q Are there risks to that cisgender girl.

9 A Well, if -- if -- if we're going to say that
10 there -- sports is not a zero sum risk, then any 02:23:59
11 participation involves some risk.

12 Q Okay. Well, do you think it's safe for a
13 high school girl to play tackle football with a high
14 school boy?

15 MR. FRAMPTON: Object to the form. 02:24:16

16 THE WITNESS: You want to specify that
17 question more or just leave it the way it is?

18 BY MR. BLOCK:

19 Q I want -- do you think it's safe for a high
20 school girl to play tackle football with a high 02:24:29
21 school boy?

22 MR. FRAMPTON: Same objection.
23 Go ahead.

24 THE WITNESS: I think that there is
25 heightened risk for a high school girl to play 02:24:36

1 football with a high school boy; however, there's a
2 couple of things to say about that.

3 First of all, that individual can select
4 certain positions that are going to reduce the risk
5 more than others. So, for instance, you might have 02:24:55
6 somebody who kicks the ball off, who -- (technical
7 difficulty).

8 Second, in that case, it's an individual
9 choosing to participate and assuming that risk.

10 But as to whether there is risk, yeah, 02:25:15
11 there's risk.

12 BY MR. BLOCK:

13 Q Are you able to compare that risk to the risk
14 of 11-year-old boys and girls playing soccer
15 together? 02:25:27

16 MR. FRAMPTON: Object to the form.

17 THE WITNESS: Am I able to compare the risk
18 of a high school female playing football on a men's
19 team with 11-year-old boy and girls playing soccer
20 together? Is that what you're asking? 02:25:48

21 BY MR. BLOCK:

22 Q That's what I'm asking.

23 MR. FRAMPTON: Same objection.

24 THE WITNESS: That's not something that's
25 been looked at. 02:25:57

1 If you're asking me whether there's a general
2 increase in risk, I would say yes.

3 BY MR. BLOCK:

4 Q An increase in risk for the football fact
5 pattern? 02:26:13

6 MR. FRAMPTON: Object to the form.

7 THE WITNESS: That's not what you asked.

8 BY MR. BLOCK:

9 Q Well, I'm just trying to understand what you
10 said at the end. 02:26:19

11 You said, If you're asking if it's a general
12 increase in risk, I'd say yes.

13 I just wanted to just clarify what you were
14 referring to at the end.

15 A I'm not sure what you were asking. So you 02:26:29
16 were asking whether --

17 Q What's -- what's -- sorry, I -- I can clarify
18 my question. Would that help?

19 A Yes, I think so.

20 Q Yeah, what's riskier, an 11-year-old girl 02:26:40
21 playing soccer with an 11-year-old boy or a
22 17-year-old girl playing football with a 17-year-old
23 boy?

24 A Well, that's anecdote and --

25 MR. TRYON: Objection. 02:26:56

1 BY MR. BLOCK:

2 Q Go on.

3 MR. TRYON: Go ahead.

4 THE WITNESS: Me? Okay.

5 That's anecdote. And it's obviously going to 02:27:06
6 depend on this situation.

7 If you're comparing a high school placekicker
8 and that's all she does to two 11-year-olds where
9 there's wide discrepancy between a larger, faster
10 male and a smaller, slower female, then there's 02:27:28
11 going to be more risk in the soccer side of it. If
12 you're comparing a high school female who's playing
13 linebacker, the risk might fall to the other side.
14 But those are hypotheticals around, again,
15 anecdotes, so... 02:27:51

16 BY MR. BLOCK:

17 Q Isn't this whole -- isn't your expert report
18 all about hypotheticals and anecdotes?

19 MR. FRAMPTON: Object to the form.

20 THE WITNESS: I wouldn't say that they're 02:28:03
21 about anecdotes. I would say that it's based on
22 modeling assumptions that -- informed by research
23 that speaks to a sex-based difference.

24 BY MR. BLOCK:

25 Q And those same modeling assumptions would 02:28:24

1 allow you to compare the risks of 11-year-olds
2 playing soccer together to 17-year-olds playing
3 football together; right?

4 MR. FRAMPTON: Object to the form.

5 THE WITNESS: To your point, I look at -- 02:28:44
6 yes, the -- the -- the modeling risks apply to many
7 different age categories.

8 BY MR. BLOCK:

9 Q Is there any data at all on injuries to
10 cisgender prepubertal girls from playing with 02:29:09
11 cisgender prepubertal boys?

12 A I'm not aware of that specifically, no.

13 Q On page -- paragraph 78. Let me know when
14 you're at paragraph 78.

15 A Okay. 02:30:09

16 Q Okay. Paragraph 78, you say (as read):

17 "Of course there exists variation in
18 all these factors within a given
19 group of males or females. However,

20 it is also true that within 02:30:17

21 sex-specific pools, size
22 differential is somewhat predictable
23 and bounded, even considering
24 outliers."

25 Did I read that right? 02:30:25

1 A Yes.

2 Q Okay. So I think this goes back a little bit
3 to our discussion from -- from before, having a
4 larger cisgender woman on a girls' -- a woman's
5 sports team is riskier to the other participants 02:30:43
6 than having a smaller cisgender woman on that team;
7 correct?

8 A I don't -- you're equating size to risk in a
9 way that make it hard to answer that question. You
10 haven't told me the sport. You haven't told me the 02:31:18
11 other characteristics of the athletes. So it could
12 run either way.

13 Injury risk is a net effect. You could have
14 a -- well, I'll just leave it at that.

15 Q Okay. So you say size differential here, so 02:31:37
16 that's why I talked about size.

17 When you -- when you said it's also true that
18 within sex-specific pools, size differential is
19 somewhat predictable.

20 What point were you making when you said 02:31:51
21 that?

22 A I -- I -- I suppose a more artful way to say
23 that would be physical attributes are somewhat --
24 or -- or performance-based attributes -- physical
25 and performance attributes are somewhat predictable 02:32:35

1 and bounded.

2 Q And so your concern about allowing
3 transgender women to participate on women's teams is
4 that you would be introducing athletes into the pool
5 that fall outside of the outer bounds that would 02:32:50
6 exist if it were just limited to cisgender women
7 athletes?

8 MR. FRAMPTON: Objection --

9 THE WITNESS: It --

10 MR. FRAMPTON: -- to form. 02:33:04

11 BY MR. BLOCK:

12 Q Go ahead.

13 A My concern would be that in -- in the
14 aggregate, there are more than any one -- there's
15 more than any one attribute that makes up a male, 02:33:12
16 and that taken as a whole, those attributes fall
17 outside the bounds of -- into the other pool.

18 Q And is that going to be true for every
19 transgender woman?

20 A I can't speak to how that would apply to any 02:33:38
21 given -- (technical difficulty) -- but from a
22 population standpoint, it would certainly hold true.

23 Q So what if eligibility were limited to
24 transgender women whose physical attributes fell
25 within the -- the predictable and bounded range of 02:34:18

1 physical attributes for cisgender women, would that
2 raise safety concerns?

3 MR. FRAMPTON: Object to the form.

4 THE WITNESS: There's problems, first of all,
5 with measurement validity when we're talking about 02:34:33
6 an unlimited -- kind of an unbounded list of
7 biological categories. So that's a problem.

8 So I -- I don't -- I think there's an
9 assumption underneath all of that that says that you
10 can kind of boil down a transgender and cisgender 02:34:49
11 female into the exact same categories, and I -- I
12 don't know that that's true.

13 BY MR. BLOCK:

14 Q Do you know the effects of lowering
15 testosterone to levels of circulating testosterone 02:35:11
16 typical of women on all the various physiological
17 attributes that would play into the analysis of
18 safety?

19 A That's an evolving area of study, and it
20 hasn't been completely studied yet, but the -- but 02:35:40
21 the -- the net effect of the studies that we do have
22 seem to tilt in the same direction, which is that
23 there is retained difference.

24 Q In your report, you talk about internal risk
25 factors and external risk factors; correct? 02:36:32

1 A Correct.

2 Q Okay. And if you look at your report on --
3 go to section -- on page 33, section VI.

4 A Are you talking about paragraph 57?

5 Q Yeah, yeah. But I'm focusing on the headline 02:37:08
6 "Enhanced Female Vulnerability to Certain Injuries,"
7 right? Do you see that?

8 A I see that.

9 Q Okay. And then there's -- there's a
10 subsection A on concussions and a subsection B on 02:37:23
11 ACL tears.

12 Are the things discussed in this section an
13 example of internal risk factors?

14 A Well, I -- you know, when you go back and you
15 look at the discussion around injury epidemiology, 02:37:45
16 I -- I think I make it clear that -- that those are
17 often blended.

18 And so in the case of both concussion and ACL
19 risk, there are -- there are innate things about the
20 female that seem to predispose them to those 02:38:04
21 injuries, but at the same time, those injuries can
22 be imparted by being struck, so...

23 Q And are -- is there any data on the
24 susceptibility of transgender girls and women to
25 those injuries, you know, if they have had puberty 02:38:30

1 blockers followed by gender-affirming hormones?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: I'm not aware of research

4 specifically looking at the risk of a transgender

5 female who's prepubertal to ACL risk or concussion 02:38:52

6 risk.

7 Did I say transgender prepu- -- pre- --

8 prepubertal females?

9 BY MR. BLOCK:

10 Q I thought you did. Or at least that's what I 02:39:16

11 understood.

12 A I just wanted to clarify.

13 Q So if you -- turn to page 4 in your report.

14 A Okay.

15 Q On the second -- the -- the -- you know, 02:39:47

16 actually, let's go to Exhibit 81. So this is the

17 first white paper you -- you -- you made. Page 3.

18 It's page 3 of Exhibit 81, on the -- the internal

19 pagination.

20 A Okay. I'm -- I'm there. 02:40:09

21 Q Okay. So this paragraph, it says (as read):

22 "Unfortunately, apart from

23 World Rugby's careful review, the

24 public discourse is lacking any

25 careful consideration of the 02:40:31

1 question of safety. As a physician
2 who has spent my career caring for
3 athletes, I find this silence about
4 safety both surprising and
5 concerning. It is my hope through
6 this white paper to equip and
7 motivate sports leagues and policy
8 makers to give adequate attention to
9 the issue of safety for female
10 athletes."

02:40:39

02:40:49

11 Did I read that right?

12 A Yes, you did.

13 Q Okay. And does this white paper disclose
14 anywhere that you were hired to write it by ADF?

15 MR. FRAMPTON: Object to the form.

02:41:04

16 THE WITNESS: I don't think that that's in
17 there, no.

18 BY MR. BLOCK:

19 Q Okay. When -- when you say in the white
20 paper that you find the silence about safety both
21 surprising and concerning, when did you acquire that
22 opinion?

02:41:18

23 A I imagine in the context of culling together
24 this material.

25 Q So you didn't mean to say that you were just

02:41:43

1 a doctor listening to the discourse and just spurred
2 into action organically by your surprising concern
3 about the lack of discussion of safety?

4 MR. FRAMPTON: Object to the form.

5 THE WITNESS: Well, I think going back to 02:42:05
6 what we were talking about earlier, I -- I -- you
7 know, this -- this issue has become more prominent
8 on the public radar, particularly over the last five
9 years, and -- you know, so from the beginning, when
10 I was with AMSSM, you know, those conversations were 02:42:22
11 cropping up.

12 And as I said earlier, I had some concerns
13 about the issue of safety when it came to size
14 differential, but those concerns -- I -- I believe
15 that those concerns have been validated by review of 02:42:43
16 the available evidence in conjunction with my
17 experience as a physician.

18 BY MR. BLOCK:

19 Q Going back to your -- your February 2022
20 report, on page 7. 02:43:11

21 A Okay.

22 Q So in this paragraph, you discuss various
23 sports that fall within your definition of contact
24 or collision, and I wanted to --

25 A What -- what page are you on? 02:43:41

1 Q Page 7 of your February 22 report,
2 Exhibit 80.

3 Oh, no, I'm sorry --

4 A I'm not seeing that.

5 Q No, no, no, no. I was looking at the wrong 02:43:57
6 one, I apologize. It was my -- my fault.

7 This would then be page -- page 9 of your --
8 of that one.

9 A Okay.

10 Q So you're -- you're discussing here -- you're 02:44:21
11 listing various sports that fall within your
12 definition of collision and contact.

13 A Uh-huh.

14 Q And we have boxing, wrestling, rugby,
15 ice hockey, football, basketball. And then we also 02:44:36
16 have mixed martial arts, field hockey, soccer,
17 rugby, lacrosse, volleyball, baseball and softball.

18 Do you think that the increased risk that you
19 talk about is equally present to the same degree in
20 all of these sports that you list? 02:45:05

21 A No, I wouldn't say that.

22 Q Okay. So there's some contact in collision
23 sports where there's a greater increased risk than
24 another contact in collision sports; right?

25 A That's correct. 02:45:17

1 Q Which of these contact and collision sports
2 do you think have the least degree of increased
3 risk?

4 A Of the sports listed there, I would -- I -- I
5 would qualify this and say -- you know, I would need 02:45:39
6 to rely on epidemiological statistics, but I would
7 guess that in terms of traumatic injury, volleyball
8 is probably near the bottom.

9 MR. BLOCK: If you could just give me another
10 five minutes, I'll -- I'll just come back with any 02:46:21
11 remaining questions I have.

12 Can -- can we go off the record?

13 THE VIDEOGRAPHER: We are off the record at
14 2:46 p.m., Central Time.

15 (Recess.) 02:56:18

16 THE VIDEOGRAPHER: We are on the record at
17 2:56 p.m., Central Time.

18 BY MR. BLOCK:

19 Q Okay. So just a few more questions,
20 Dr. Carlson, but I won't keep you too much longer. 02:56:31

21 If you could go to -- oh, jeez. I thought I
22 had the paper -- page -- this is it. Page 28 of
23 your -- of Exhibit 80, your February 2022 report.

24 A Page 28?

25 Q Yeah. Paragraph 49. 02:57:09

1 A Okay.

2 Q Just four lines down, you -- you say, in a
3 parenthetical, that prime athletic years are ages 18
4 to 29.

5 Do you see that? 02:57:43

6 A Yes.

7 Q Could you explain why those are the prime
8 athletic years?

9 A Well, it's -- I don't recall offhand how I
10 came to include that in, so... But looking at it, 02:58:04
11 it's roughly from the age of the end of puberty
12 through your third decade. That makes sense to me.

13 Q Why does it make sense to you that the prime
14 athletic years would begin roughly at the age of the
15 end of puberty? 02:58:25

16 A We -- we've already spoken somewhat to the
17 effect of puberty on performance.

18 Q So the -- the further along on -- you are on
19 puberty, the greater effect it will have on your
20 performance? 02:58:50

21 A I -- I think that that term -- or that --
22 that phrase could be rephrased in -- in other ways.
23 Because obviously it depends on the sport; right?
24 So take gymnastics, for example, the prime years for
25 an Olympic gymnast are not going to fall in that 02:59:16

1 range.

2 Q Do you think that a trans girl has an
3 athletic advantage over a cisgender girl in girls'
4 gymnastics?

5 A I have never -- 02:59:30

6 MR. FRAMPTON: Object to the form.

7 Go ahead.

8 THE WITNESS: I have never considered that.

9 BY MR. BLOCK:

10 Q Well, sitting here, considering it now, can 02:59:40
11 you -- what's your opinion?

12 A Do I think a trans girl has an advantage over
13 a cis girl in women's gymnastics?

14 Q Yes.

15 MR. FRAMPTON: Object to the form. 02:59:50

16 Go ahead.

17 THE WITNESS: It would depend on the
18 apparatus that you're talking about, I suppose. For
19 instance, assuming that that individual may have an
20 advantage in vault. But again, you're -- we're 03:00:08
21 talking about anecdotal hypothesis about individuals
22 and not population, so -- you know, I -- I don't
23 know that I can really answer that question.

24 BY MR. BLOCK:

25 Q Well, at a population level, do you think 03:00:26

1 transgender girls have an athletic advantage over
2 cisgender girls in girls gymnastics?

3 MR. FRAMPTON: Same objection, form and
4 scope.

5 Go ahead. 03:00:36

6 THE WITNESS: Certainly not all the way
7 around, but there may be aspects of different events
8 in gymnastics that they -- they may have a -- they
9 may have some advantage within.

10 BY MR. BLOCK: 03:00:56

11 Q So are you -- would you -- do you feel
12 confident in that answer? I know I just asked you
13 to give it off the top of your head, so is that, you
14 know, an answer that you -- you feel sure about
15 or -- 03:01:07

16 A Well, that study -- that -- that has never
17 been looked at, as far as I'm aware, in a
18 peer-reviewed study, but to the extent that you're
19 making me answer it, I think I've given you an
20 answer. 03:01:20

21 Q Okay. If you could go to --

22 A Sorry, I didn't hear you.

23 Q No, sorry, I -- I -- I stopped my sentence
24 halfway through.

25 If you can go to page 59. 03:01:47

1 A Okay.

2 Q Okay. So in the second sentence of that
3 paragraph, you say (as read):

4 "While, as I have noted, some
5 biological males have indeed 03:02:20
6 competed in a variety of girls' and
7 women's contact sports, the numbers
8 up till now have been small."

9 Excuse me.

10 "But recent studies have reported 03:02:31
11 very large increases in the number
12 of children and young people
13 identifying as transgender compared
14 to historical experience. For
15 example, an extensive survey of 9th 03:02:39
16 and 11th graders in Minnesota found
17 that 2.7% identified as transgender
18 or gender-nonconforming— well over
19 100 times historical rates..."

20 And you cite that to Rider 2018 for that. 03:02:54
21 Did I read that right?

22 A I believe so.

23 Q Okay. Well, first of all, are you aware of
24 any statistics about the number of people
25 identifying as transgender in West Virginia? 03:03:07

1 (Exhibit 85 was marked for identification
2 by the court reporter and is attached hereto.)

3 THE WITNESS: I said I have it up.

4 BY MR. BLOCK:

5 Q Okay. Great. Could you go to page 2. 03:05:20

6 A I'm there.

7 Q Okay. So if you -- just scroll down to --
8 just -- actually, you don't even have to scroll
9 down. The second sentence on page 2, where it
10 describes -- it begins with "gender nonconforming." 03:05:41

11 A Yes.

12 Q Okay. So page -- so this sentence says (as
13 read):

14 "Gender nonconforming describes
15 individuals whose gender expression 03:05:54
16 does not follow stereotypical
17 conventions of masculinity and
18 femininity and who may or may not
19 identify as transgender."

20 Do you see that? 03:06:04

21 A Yes, I see that.

22 Q Okay. Do you think that -- to the extent
23 that the study is talking about gender nonconforming
24 people, do you think it's still relevant to
25 assessing an increase in transgender people 03:06:17

1 participating in girls and women's sports?

2 MR. FRAMPTON: Object to the form.

3 THE WITNESS: I -- the definition that you
4 just read for me is not the same thing as a
5 transgender individual as you've defined it. 03:06:38

6 BY MR. BLOCK:

7 Q Okay. Now, if you go to -- if you go to the
8 first page of the study, for the abstract, if you go
9 to "Results."

10 A Yes, I see that. 03:07:17

11 Q So it says (as read):

12 "We found that students who are TGNC
13 reported significantly poorer
14 health, lower rates of preventative
15 health checkups, and more nurse 03:07:26
16 office visits than cisgender youth.

17 Do you see that?

18 A I do see that.

19 Q All right. As a general matter, at a
20 population level, if a group of folks reports 03:07:38
21 significantly poorer health than a control group, is
22 that usually a sign of athletic advantage?

23 MR. FRAMPTON: Object to the form.

24 Go ahead.

25 THE WITNESS: That's so far removed from 03:07:55

1 specifics of athletic advantage that I don't know
2 that I can answer that, what -- what -- what plays
3 into poorer health.

4 BY MR. BLOCK:

5 Q Okay. Well, do -- do you think that having a 03:08:15
6 poor -- poorer health -- well, what connection do
7 you have -- do you see, if any, between, you know,
8 someone having poorer health and being a good
9 athlete?

10 MR. FRAMPTON: Object to the form. 03:08:35

11 THE WITNESS: Again, I -- I think without
12 knowing how poorer health is defined here, I
13 hesitate to answer that question.

14 BY MR. BLOCK:

15 Q Okay. Well, is it fair to say that there are 03:08:47
16 a variety of ways in which, at a population level,
17 the -- the health of transgender girls and women may
18 be different than the health of cisgender boys and
19 men?

20 MR. FRAMPTON: Same objection. 03:09:10

21 THE WITNESS: Again, I'm a board-certified
22 sports medicine physician, I'm not an
23 endocrinologist, and you're asking questions about
24 population distinctions between transgender and
25 cisgender individuals. I don't know that I was 03:09:24

1 retained to ask -- answer those questions.

2 BY MR. BLOCK:

3 Q So -- so you can't offer an expert opinion on
4 how similar or dissimilar transgender girls and
5 women are to cisgender boys and men --

03:09:43

6 MR. FRAMPTON: Object to --

7 THE WITNESS: I didn't --

8 MR. FRAMPTON: -- the form.

9 THE WITNESS: -- say that. You were asking
10 me about their population -- the reflection of
11 overall health on that population versus cisgender.

03:09:53

12 Is that what you're asking me?

13 BY MR. BLOCK:

14 Q Well, I asked you that, and then I asked you
15 another question, which is, you know, the basis for
16 your expert opinion opining on the similarities
17 between cisgender girls and women -- excuse me. I
18 was asking the basis for your expert opinion opining
19 on the similarities between transgender girls and
20 women and cisgender boys and men.

03:10:10

03:10:27

21 A Between trans- --

22 MR. FRAMPTON: Object to the form.

23 Go ahead.

24 THE WITNESS: Between transgender boys and
25 women, is that what you said?

03:10:39

1 BY MR. BLOCK:

2 Q Transgender girls and women compared to
3 cisgender boys and men. What's the basis of your
4 expertise in drawing a comparison between those two
5 groups of people? 03:10:52

6 A So you're talking about trans women --

7 Q Yes.

8 A -- or trans men?

9 Q Sorry, I'm talking about trans girls and
10 women and cis -- 03:11:01

11 A Can you rephrase --

12 Q -- boys and men --

13 A -- the question because I'm not sure -- I
14 want to understand what you're saying.

15 Q Yeah. People assigned a male sex assigned at 03:11:09
16 birth who have female gender identities are the
17 people I'm referring to as trans girls and women.

18 A Okay.

19 Q And my question is, do you have any expert
20 basis to opine on how similar that group of people 03:11:30
21 are to cisgender boys and men?

22 MR. FRAMPTON: Object to the form.

23 Go ahead.

24 THE WITNESS: Yes, I do.

25 ///

1 BY MR. BLOCK:

2 Q And what -- what is that expert basis? What
3 is the basis for that expert opinion?

4 A I'm a board-certified sports medicine
5 physician, and I can speak to the safety issues 03:11:53
6 involved with these two populations.

7 Q But are you -- you don't -- what information
8 do you have about the -- you know, the -- the health
9 and physical profile of transgender girls and women?

10 MR. FRAMPTON: Object to the form. 03:12:12

11 THE WITNESS: I think I told you that, A, I
12 was retained to speak to the issues around these
13 populations that deal with sports safety.

14 BY MR. BLOCK:

15 Q And -- okay. So what's the basis of your 03:12:42
16 ability to render an expert opinion, though?

17 MR. FRAMPTON: Object to the form.

18 Go ahead.

19 THE WITNESS: Sure, I understand the
20 question. I'm sorry. 03:12:55

21 I -- I'm not sure how that relates to what
22 we're looking at here.

23 BY MR. BLOCK:

24 Q Sure. Sure. And I -- I -- I won't keep you
25 too much longer. 03:13:06

1 I understand everything you've opined on in
2 your report about cisgender boys and men and their
3 differences between cisgender girls and women. You
4 know, this case is about transgender girls and women
5 and that population, you would agree, is different 03:13:26
6 in some ways, at least, from cisgender boys and men;
7 right?

8 MR. FRAMPTON: Object to the form.

9 Go ahead.

10 THE WITNESS: There aren't population-level 03:13:35
11 studies that have really looked at that. You can --
12 so I don't know that we can say that.

13 BY MR. BLOCK:

14 Q So without population studies that have
15 looked at transgender girls and women, we can't say 03:13:57
16 whether they are the same as cisgender boys and men;
17 right?

18 MR. FRAMPTON: Object to the form.

19 THE WITNESS: Are you saying that -- are you
20 asking if there are baseline characteristic 03:14:18
21 differences between transgender women and cisgender
22 women?

23 BY MR. BLOCK:

24 Q Sure. That's one of them. Sure, yes. No,
25 no, no, no. No. I'm asking between transgender 03:14:35

1 women and cisgender men.

2 Are there baseline differences between
3 transgender women and cisgender men?

4 A We don't have good studies that were designed
5 to look at large populations to answer baseline 03:14:51
6 questions. We have inferences we can make about
7 certain studies. That's it.

8 Q Okay.

9 MR. BLOCK: All right. Thank you,
10 Dr. Carlson. That's all the questions I have. 03:15:02

11 THE WITNESS: Thank you.

12 THE VIDEOGRAPHER: Any other questions?

13 MR. TRYON: This is Dave --

14 THE VIDEOGRAPHER: Okay.

15 MR. TRYON: This is Dave Tryon from the State 03:15:13
16 of West Virginia. I -- I have no questions for the
17 witness.

18 MR. CROPP: This is Jeffrey Cropp for the
19 defendants Harrison County Board of Education and
20 Superintendent Dora Stutler. I have no questions. 03:15:24

21 MS. MORGAN: This is Kelly Morgan on behalf
22 of the West Virginia Board of Education and
23 Superintendent Burch. I have no questions.

24 Thank you very much.

25 MS. GREEN: This is Roberta Green on behalf 03:15:36

1 of WVSSAC. I have no questions.

2 Thank you.

3 THE VIDEOGRAPHER: We are off the record
4 at --

5 MR. FRAMPTON: Hang on. Hang on. Hang on. 03:15:50
6 Hang on.

7 I have -- I think I've got probably one just
8 to follow-up on Mr. Block's last question.

9 Dr. Carlson, do we have information on
10 whether there are retained physical advantages when 03:16:04
11 people undergo a transition from -- undergo a
12 transition from male to female?

13 MR. BLOCK: Objection to form.

14 THE WITNESS: Yes.

15 MR. FRAMPTON: Okay. That's all I had. 03:16:19

16 MR. BLOCK: All right. So I have another
17 question.

18 BY MR. BLOCK:

19 Q What -- can you please describe the studies
20 that we have that provide information that form the 03:16:36
21 basis of your answer to counsel's question?

22 A Retained differences in -- well, the Roberts
23 study, for one. The Roberts study showed retained
24 differences in speed.

25 Q Are there any others? 03:17:12

1 A There are -- there are studies that look at
2 retained differences in -- in muscle mass and -- so
3 the Wiik study.

4 Q And we don't --

5 A Many of these are cited in my report. 03:17:51

6 Q And -- and we don't have any studies on the
7 differences between transgender girls and women and
8 cisgender boys and men before transition, do we?

9 MR. FRAMPTON: Object to the form.

10 Go ahead. 03:18:08

11 THE WITNESS: Say that one more time.

12 BY MR. BLOCK:

13 Q We don't have any studies on the differences
14 between transgender girls and women and cisgender
15 boys and men before transition, do we? 03:18:16

16 MR. FRAMPTON: Same objection.

17 Go ahead.

18 THE WITNESS: I don't believe -- again, I
19 can't recall if the Klaver study made that
20 comparison, so I'd have to go back and look at it. 03:18:46

21 MR. BLOCK: No further questions.

22 THE VIDEOGRAPHER: Anyone else?

23 MR. FRAMPTON: I don't have anything further.

24 THE VIDEOGRAPHER: We are off the record at
25 3:19 p.m., Central Time. This completes today's 03:19:02

1 deposition of Dr. Chad Carlson.

2 The total number of media units used was
3 eight and will be retained by Veritext Legal
4 Solutions.

5 (TIME NOTED: 3:19 p.m.)

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Exhibit 33



Mountain Hollar MS Invitational MS

72 Followers

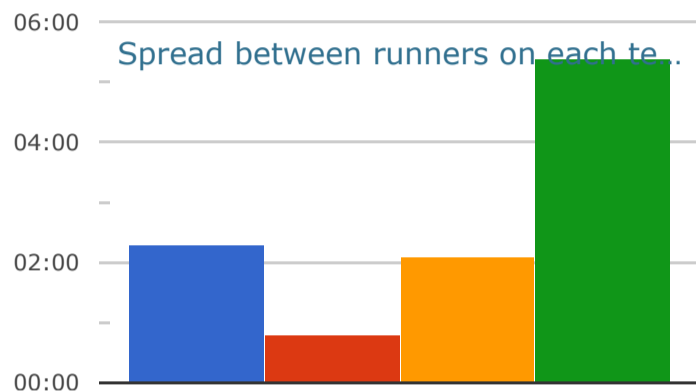
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OFFICIAL Thu, Sep 2, 2021 University High School

← Womens 3,200 Meters Junior Varsity

All Grades ▾ All Teams ▾ All Divisions ▾ Other Filters ▾ Highlighter

Team Spread ▾



First Athlete ▾ Last Athlete ▾

Official Team Scores

1. Suncrest	29
2. South (Morgantown)	39
3. Mountaineer (Morgantown)	78
4. Bridgeport	99

1. 8 Stella Bleech	15:54.3	South (Morgantown)
2. 8 Chloe Sickles	16:00.4	South (Morgantown)
3. 6 Emma Zhou	16:12.8	Suncrest
4. 7 Janie Gilchrest	16:14.5	Suncrest
5. 8 Mia McCutcheon	16:19.7	Suncrest
6. 7 Linsey Kramer	16:41.3	East Fairmont
7. 8 Maliah Dalton	16:41.8	South (Morgantown)
8. 7 Maddie Fritsch	16:48.6	Mountaineer (Morgantown)
9. 6 JJ Monroy	16:53.8	Suncrest
10. 7 Paige Snyder	16:55.4	East Fairmont
11. 7 Olivia Lupo	17:00.9	Suncrest
12. 6 Chelsea Payne	17:02.9	Braxton County
13. 7 Graylee Linville	17:09.8	Bridgeport
14. 7 Lauren Krantz	17:10.6	Suncrest
15. 7 Elizabeth Esposito	17:11.9	Suncrest
16. 7 Ayla McCasi	17:13.9	South (Morgantown)
17. 7 Kylie Cline	17:20.7	Covenant Christian
18. 8 Miley Dong	17:21.8	Suncrest
19. 8 Adrienne Reger	17:25.3	Mountaineer (Morgantown)
20. 7 Grayson Martucci	17:27.8	Suncrest
21. 6 Anna Houde	17:32.8	Suncrest
22. 6 Emma Kniceley-See	17:34.4	Bridgeport
23. 6 Kelea Anderson	17:38.3	Suncrest
24. 6 Maria Strager	17:41.9	Mountaineer (Morgantown)
25. 7 A. Monroe	17:49.4	Suncrest
26. 8 Allie Myers	17:49.6	Suncrest
27. 8 Brynn Lewis	18:01.1	Suncrest
28. 8 Emily McDonald	18:12.6	South (Morgantown)
29. 8 Samantha Zizzi	18:16.1	South (Morgantown)
30. 6 Arianna Howell	18:17.7	South (Morgantown)
31. 8 Anna McBee	18:25.3	Mountaineer (Morgantown)
32. 6 Maggie Bailey	18:30.3	Suncrest
33. 8 Avery Dickerson	18:33.8	South (Morgantown)
34. 6 Elaina Beard	18:42.9	South (Morgantown)
35. 8 Nataline Wolfe	18:54.2	Mountaineer (Morgantown)
36. 6 Braydan Whitesel	18:59.8	Braxton County
37. 8 Maya Ramsey-Murry	19:06.3	Suncrest
38. 7 Hannah Staley	19:28.2	Suncrest
39. 6 Emily Liu	19:53.9	Suncrest
40. 7 Maria Abelsayed	20:00.9	Suncrest

41. 7	Zuzanna Michalski	20:14.3	Mountaineer (Morgantown)
42. 7	Addison Berg	20:28.6	Covenant Christian
43. 8	Payton Janssen	20:43.7	Bridgeport
44. 6	Rylee Lemley	20:52.8	Mountaineer (Morgantown)
45. 6	Sara Minchau	20:54.5	Mountaineer (Morgantown)
46. 0	Brigid Wilson	20:56.9	Suncrest
47. 7	Ashlyn Poach	21:42.5	St. Francis Central Catholic
48. 6	Margaret (Maggie) Cable	21:46.1	Bridgeport
49. 6	Claire Jones	22:02.3	South (Morgantown)
50. 6	Alden Owen	22:24.4	St. Francis Central Catholic
51. 6	Becky Pepper-Jackson	22:33.9	Bridgeport
52. 8	Faith Noss	22:42.7	Central Preston
53. 7	Caitlin Murray	22:55.7	Bridgeport
54. 7	Alexis Thomas	22:55.9	South (Morgantown)
55. 7	Elsa Meyer	23:48.1	Suncrest
56. 8	Shea Lingo	23:52.8	Suncrest
57. 8	Macy Giles	24:12.1	South (Morgantown)
58. 7	Lilah Allison	24:23.5	Suncrest
59. 6	Peyton Ice	24:34.7	East Fairmont
60. 7	Elizaveta Abbitt	24:51.2	St. Francis Central Catholic
61. 8	Keirston Pugh	24:55.9	Bridgeport
62. 7	Olivia Markley	25:03.8	East Fairmont
63. 7	Baylee Yost	25:29.2	Suncrest
64. 7	Amelia Fisher	26:47.8	Mountaineer (Morgantown)
65. 6	Emma Sherwin	26:50.2	Mountaineer (Morgantown)
66. 6	Havanna Davis	30:26.8	Suncrest

Exhibit 34



Doddridge Invitational MS

0 Followers

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OFFICIAL Thu, Sep 16, 2021 Doddridge County Park

← Womens 3,000 Meters Middle School

All Grades ▾ All Teams ▾ All Divisions ▾ Other Filters ▾ Highlighter

Official Team Scores

1. Pleasants County	61
2. Braxton County	76
3. East Fairmont	110
4. Tyler Consolidated	122
5. Warren Local	138
6. Mountaineer (Clarksburg)	166
7. Taylor County	197
8. West Fairmont	210
9. Bridgeport	213
10. Wirt County	273
11. Buckhannon-Upshur	281
12. Ritchie County	286
13. Washington Irving	320
14. Lincoln	385
15. Westwood	427

Charts & Hypothetical Scores

Did you know meets hosted by Site Supporters display additional analysis tools?

Are you a meet host? [Learn About Supporter Benefits](#)

1. 7 Anna Bennett	12:00.24	Pleasants County
2. 8 Kailee Haymond	12:31.40	East Fairmont
3. 8 Addison Lloyd	12:59.85	Braxton County
4. 7 Makenna Martin	13:13.89	Tyler Consolidated
5. 8 Tillie Cinalli	13:20.28	West Fairmont
6. 8 Bailey Pritt	13:25.51	Braxton County
7. 7 Marley Sias	13:25.77	Doddridge County
8. 7 Maddie Smith	13:33.78	Pleasants County
9. 6 Annabelle Skidmore	13:34.41	East Fairmont
10. 7 Julia Angiulli	13:37.77	Mountaineer (Clarksburg)
11. 8 Bentlee Williams	13:39.15	Ritchie County
12. 6 Avry Bennett	13:41.59	Pleasants County
13. 8 Kaitlyn Key	13:45.11	Mountaineer (Clarksburg)
14. 7 Mackinzey Budner	13:46.29	Braxton County
15. 7 Maddy Cox	13:47.57	Tyler Consolidated
16. 7 Ella Egidi	13:50.85	West Fairmont
17. 8 Sophia Austin	14:03.10	Taylor County
18. 8 Kaelyn Robinson	14:04.38	Wirt County
19. 6 Mariah Whitlock	14:06.40	Pleasants County
20. 8 Hollyn Reed	14:07.19	Warren Local
21. 8 Sophie Stuck	14:10.78	East Fairmont
22. 6 Hayden Henderson	14:13.00	Bridgeport
23. 8 Payton Trent	14:14.16	Doddridge County
24. 8 Ashley McBrayer	14:25.36	Bridgeport
25. 7 Leah Payne	14:29.83	Braxton County
26. 7 Savana Burd	14:33.84	Pleasants County
27. 8 Abby Whited	14:40.57	Warren Local
28. 7 Aslee Pate	14:43.89	Warren Local
29. 7 Madison Altman	14:52.44	Washington Irving
30. 7 Lily Dillaman	15:05.31	Tyler Consolidated
31. 8 Brea Lathon	15:15.32	Mountaineer (Clarksburg)
32. 7 Camryn Westbrook	15:16.49	Tyler Consolidated
33. 6 Reece Carpenter	15:17.18	Braxton County
34. 8 Natalee Cartwright	15:18.76	Taylor County
35. 7 Suzanna Whipkey	15:19.69	Warren Local

36.	7	Kylie Cline	15:20.97	Covenant Christian
37.	6	Madison Knabenshue	15:21.68	Buckhannon-Upshur
38.	8	Cate Edgell	15:25.72	Warren Local
39.	8	Cassidy McCarthy	15:29.05	Warren Local
40.	7	Avery Moore	15:30.57	West Fairmont
41.	7	Paige Snyder	15:31.35	East Fairmont
42.	6	Natalie Beltner	15:36.94	Taylor County
43.	8	Annika Shuman	15:39.36	Mountaineer (Clarksburg)
44.	7	Nevaeh Bolin	15:40.56	Ritchie County
45.	7	Piper Woofter	15:41.55	East Fairmont
46.	6	Liza Saas	15:43.62	Washington Irving
47.	8	Absidee Carpenter	15:45.71	East Fairmont
48.	7	Ryleigh Bills	15:46.26	East Fairmont
49.	6	Andi Fiber	15:49.01	Tyler Consolidated
50.	6	Addison Sole	15:52.64	Taylor County
51.	6	Addi McGrady	15:53.95	Pleasants County
52.	8	Lauren Pritt	15:54.66	Braxton County
53.	7	Audrey Duckworth	15:57.28	Braxton County
54.	7	Savannah Holden	15:58.87	South Harrison
55.	8	Chloe Marsh	15:59.26	Bridgeport
56.	8	Issabella Speece	16:00.13	Wirt County
57.	6	Haley Woody	16:12.03	Buckhannon-Upshur
58.	7	Jenna Willey	16:12.53	Lincoln
59.	8	Lilly Haught	16:18.77	Tyler Consolidated
60.	6	LenaRose Walker	16:21.19	Buckhannon-Upshur
61.	8	Olivia Pursley	16:24.74	Wirt County
62.	7	Linsey Kramer	16:27.30	East Fairmont
63.	6	Destinee Gray	16:31.57	Pleasants County
64.	6	Olivia Kimball	16:32.52	Pleasants County
65.	7	Jordyn McIntyre	16:40.49	Bridgeport
66.	6	Emma Kniceley-See	16:40.90	Bridgeport
67.	8	Grace Dearth	16:46.01	Warren Local
68.	7	Adalyn Moreland	16:47.91	Warren Local
69.	6	Emma Ahmed	16:50.77	Bridgeport
70.	7	Peyton Stevens	16:51.80	Taylor County
71.	8	Lily Cross	16:52.96	Wirt County
72.	6	Chelsea Payne	16:56.79	Braxton County
73.	6	Isabella Eddy	16:58.08	Lincoln
74.	7	Jahna Brown	16:59.20	Tyler Consolidated
75.	7	Anya Morehead	17:02.83	Buckhannon-Upshur
76.	7	Rania Singh	17:03.24	Warren Local
77.	6	Anna Wycoff	17:05.47	East Fairmont
78.	7	Avery Kessler	17:13.69	South Harrison
79.	7	Zoey Bunner	17:20.92	Ritchie County
80.	8	Kenna Keener	17:25.26	Taylor County
81.	7	Lauren Brown	17:25.54	South Harrison
82.	6	MillieCate Currey	17:25.73	Bridgeport
83.	6	Chloe Lewis	17:25.91	Buckhannon-Upshur
84.	8	Kamryn Watkins	17:26.10	Westwood
85.	7	Brooklyn Davis	17:26.62	Pleasants County
86.	7	Ayla Lilly	17:36.60	West Fairmont
87.	7	Graylee Linville	17:39.26	Bridgeport
88.	6	Colleen Freed	17:41.70	Ritchie County
89.	6	Isabella Bowers	17:48.16	Buckhannon-Upshur
90.	7	Rayonna Cain	17:50.94	Mountaineer (Clarksburg)
91.	7	Autumn Cecil	17:52.63	Pleasants County
92.	6	Ciarra Spring	17:53.10	Taylor County
93.	7	Adreona Moore	17:55.20	Washington Irving
94.	7	Annelise Mace	18:01.32	Bridgeport
95.	8	Paiton Thompson	18:05.51	Bridgeport
96.	8	Novalee Bennett	18:06.60	Braxton County
97.	8	Bella Casto	18:11.22	Westwood
98.	6	Alexis Buffey	18:15.84	West Fairmont
99.	6	Lyla Garcia	18:30.05	West Fairmont
100.	6	Reagan Sturgeon	18:41.15	Pleasants County
101.	7	Olivia Roberts	18:44.28	Tyler Consolidated
102.	7	Sophia Fox	18:47.12	Buckhannon-Upshur
103.	8	Cynthia Wigel	19:10.95	Wirt County
104.	7	Emily Brackman	19:15.00	Washington Irving
105.	7	Addison Berg	19:27.35	Covenant Christian
106.	8	Payton Janssen	19:35.99	Bridgeport
107.	7	Kate Urso	19:37.61	Notre Dame
108.	8	Regan Hardway	19:42.54	West Fairmont
109.	6	Katrina Guthrie	19:46.20	Lincoln
110.	6	Margaret (Maggie) Cable	19:49.23	Bridgeport
111.	6	Ainsley Alexander	19:54.42	Taylor County
112.	6	Alyena Mcl	19:57.22	Buckhannon-Upshur
113.	6	Kaitlin Davis	19:57.95	Buckhannon-Upshur
114.	8	Jacelyn Niethamer	20:19.84	Westwood
115.	8	Ava Scolapio	20:34.53	Washington Irving
116.	8	Erika Church	20:35.32	Lincoln
117.	8	Giana Armistead	20:39.78	West Fairmont
118.	6	Amelia Weekley	20:44.27	Pleasants County
119.	7	Marley Rider	21:00.11	West Fairmont
120.	8	Natalie Klemm	21:03.86	Warren Local
121.	7	Bella Allen	21:10.10	Pleasants County
122.	8	Breanna Cutright	21:14.63	Mountaineer (Clarksburg)
123.	6	Becky Pepper-Jackson	21:50.47	Bridgeport

124. 7 Olivia Markley	21:57.35 East Fairmont
125. 7 Claire McElwayne	22:01.21 Notre Dame
126. 7 Mercy Frase	22:02.14 South Harrison
127. 6 Makinsey Jeffers	22:02.35 Pleasants County
128. 8 Keirsten Pugh	22:06.93 Bridgeport
129. 6 Heaven Pittman	22:09.28 Tyler Consolidated
130. 6 Annaleigh Pierce	22:10.80 Lincoln
131. 7 Caitlin Murray	22:25.51 Bridgeport
132. 8 Ali Wilfong	22:27.85 Taylor County
133. 6 Raley Cochran	22:42.76 Lincoln
134. 6 Peyton Ice	22:46.22 East Fairmont
135. 6 Taylor Krolick	23:11.16 Ritchie County
136. 8 Autumn Wolfe	23:18.39 Westwood
137. 8 Kate Gaines	23:26.56 Westwood
138. 6 MaraBeth Hines	23:49.05 Buckhannon-Upshur
139. 6 Jordan Cox	23:55.91 Taylor County
140. 6 Arabella Jones	24:06.51 Taylor County
141. 7 Cailee Singh	24:24.88 Lincoln
142. 6 Haley Cross	24:54.03 Wirt County
143. 8 Elizabeth Conley	25:08.96 Washington Irving
144. 8 Andrea Huffman	25:16.94 Ritchie County
145. 6 Skylar Hayes	25:36.46 Lincoln
146. 8 Aaliyah Dodrill	25:40.69 Lincoln
147. 6 Lillie Nardella	27:40.92 Notre Dame
148. 6 Bella Yates	28:48.53 Bridgeport
149. 6 Zoe Fisher	29:16.46 Tyler Consolidated
150. 6 Sierra Perdue	30:00.69 Wirt County



Exhibit 35

West Virginia House of Delegates Education Committee Discussion of H.B. 3293

March 18, 2021

- Chairman Ellington: [00:00:00](#) And some of the potential witnesses today or testimony today. Um, clerk, uh, will take us out on quorum and we do have a quorum. So, uh, Vice Chair make a motion to accept the minutes from the previous meeting.
- Vice Chair: [00:00:16](#) Uh, Mr. Chairman, I move the minutes as presented in the packet, be approved.
- Chairman Ellington: [00:00:23](#) Uh, you heard the Vice Chair. Any, uh, questions, additions, deletions, directions? Chair here is now all in favor of accepting the minutes from the previous meeting, say aye.
- Audience: [00:00:32](#) Aye.
- Chairman Ellington: [00:00:34](#) Those opposed, nay. Ayes appear to have it. Ayes do have it. Minutes adopted. First on the agenda will be an originating bill. Is there any interest in the bill?
- Counsel: [00:00:43](#) Chairman Ellington, I move the bill.
- Chairman Ellington: [00:00:45](#) All right, Counsel. Counsel, explain the bill.
- Counsel: [00:00:47](#) Thank you Chairman Ellington. This bill uh, mens' current code with regard to admission and, uh, participation in single-sex sports. Uh, the bill provides that the birth certificate required for admission to public school must confirm the pupil's sex at the time of birth and the birth certificate. If a birth certificate cannot be obtained, a signed physician's statement indicating the pupil's sex based solely on the pupil's unaltered internal and external reproductive anatomy must be submitted.
- The sex confirmed at the time of admission shall be the pupil's sex for the purposes of participating in SSAC, single-sex interscholastic athletic events. Prior to the students' participation, uh, the SSAC must verify with the county board that each student participating in the single-sex athletics is participating according to, uh, sex listed according to, um, the county provision. And this requirement does not require, it does not apply to co, coed sports, and that's the bill, Mr. Chairman.
- Chairman Ellington: [00:01:51](#) All right. Any questions of the bill of Counsel? Gentlemen from the, uh, was it 43rd?
- Del. Thompson: [00:02:00](#) Yep.

Chairman Ellington: [00:02:01](#) I got it right this time.

Del. Thompson: [00:02:10](#) Thank you Chairman Ellington. Counsel, would this, if this was adopted, would this apply to, um, all ages, middle school and high school?

Counsel: [00:02:19](#) Middle school and high school, not elementary.

Del. Thompson: [00:02:21](#) Mm-hmm (affirmative).

Counsel: [00:02:21](#) So secondary.

Del. Thompson: [00:02:22](#) Okay. Um, how would, the way this bill is written and drafted, you mentioned birth certificate, but, um, so are we going to re-have to require a birth certificate for every time a student wants to play basketball or football?

Counsel: [00:02:41](#) No, if you, if you look at the, um, the originating bill, I'm on page one, "Birth certificate is required upon admission to public school." So this just requires that the sex be identified at that time. And then uh, that is the sex that the county would follow, when the student is participating in sports. So know that, that that's already done at the enrollment admissions stage.

Del. Thompson: [00:03:14](#) Okay. And correct me if I'm wrong on this, but would this preclude any student from actually participating in a sport?

Counsel: [00:03:25](#) It would preclude an opposite sex person from participating in, like in, in, in the opposite sex sport.

Del. Thompson: [00:03:33](#) Okay. So would this, like so if a, uh, a person who was born biologically male, um, let me rephrase. A person was born biologically female, but later in life, um, they have began the transition process to identify and become a male. With this bill, and they're taking testosterone, they are taking, they're under medical care and, uh, they're transitioning. So this bill would require them to play, even if they're taking testosterone, they'd be required to play, uh, girls basketball versus boys basketball, which is what they would identify with?

Counsel: [00:04:14](#) Right. If I understood, if the person was born as a female, yes. That person would under this, under this bill as it is, would have to apply.

Del. Thompson: [00:04:23](#) Even though they're, they're transitioning take it. They might even, they, uh, you know, they appear masculine, they are taking testosterone, they would have to play female sports?

Counsel: [00:04:34](#) Correct.

Del. Thompson: [00:04:35](#) Okay. Um, have any other states adopted this?

Counsel: [00:04:43](#) Uh, to my knowledge, no other states have. Um, well actually, I, I think there are a couple of states that may have passed similar laws. Um, but in most cases, a lot of those are pending. Uh-

Del. Thompson: [00:04:56](#) Am I correct in North Carolina? Did they, did they attempt to pass something similar to this?

Counsel: [00:05:05](#) Just a second.

Del. Thompson: [00:05:06](#) I believe so. Like maybe around like 2016 or 2017, I thought.

Counsel: [00:05:12](#) Uh, hmm. I don't, I don't know about North Carolina. I know there are other states that have, um, introduced various types of legislation. And I don't, that doesn't mean that I think there, there definitely are other states that have looked at different sides of the issue and, um, some have addressed it in policy or have attempted to address it in the legislation. But, um, I don't know specifically about North Carolina.

Del. Thompson: [00:05:37](#) So currently, um, students right now who identify, um, with an opposite sex of what they were assigned at birth, they can play whatever sport that they identify with. Is that correct?

Counsel: [00:05:51](#) Uh, I, the way I understand it is that, a student would participate in whatever way they're identified in WVEIS. And so that would actually be up to how the county identifies the students. So-

Del. Thompson: [00:06:06](#) So this would—

Counsel: [00:06:07](#) I'm not sure, I think the answer would be, it depends on how the county identified the student in WVEIS.

Del. Thompson: [00:06:11](#) Okay. Um, at, at the appropriate time Chairman Ellington, I don't know who would be appropriate to maybe to really clarify that question for me and is there, maybe the SSAC or, uh, maybe someone from the State Department to kind of get a better understanding of that particular question at the appropriate time.

Chairman Ellington: [00:06:31](#) Will do.

Del. Thompson: [00:06:31](#) Um, thank you. And then, uh, Counsel is, to your knowledge, um, would this apply to, uh, would this apply only, uh, like you said, secondary school in middle school and high school. Would this have any implications to collegiate sports?

Counsel: [00:06:54](#) No, it would not.

Del. Thompson: [00:06:55](#) Okay. Uh, no further questions at this time. I may have some later though.

Chairman Ellington: [00:07:01](#) All right. Gentleman from the 67th.

Del. Doyle: [00:07:04](#) Uh, thank you, Chairman Ellington. Uh, Counsel, to follow up on that. Um, the uh, and, and as background, um, some of us, some may be aware that this past football season Vanderbilt University had a female place kicker. Uh, she kicked in several games and is, am I correct that if we pass this bill, that would be prohibited, say for a high school football team in West Virginia, but it would be okay for a college team?

Counsel: [00:07:39](#) I believe that in an, I'm, maybe someone from the, um, department will be able to um, clarify this. But-

Del. Doyle: [00:07:39](#) Yeah, I, I-

Counsel: [00:07:47](#) Even under title, Title IX, if there is not a female sport that the female, that the females must be able to join a male team.

Del. Doyle: [00:07:59](#) So-

Counsel: [00:07:59](#) So I don't think that is correct.

Del. Doyle: [00:08:01](#) So if a high school had a female football team, uh, that person would have to kick for the female football team?

Counsel: [00:08:08](#) Correct.

Del. Doyle: [00:08:09](#) But would not be prohibited from kicking for the male football team? Uh, do you know of any high schools in West Virginia that have female football teams?

Counsel: [00:08:19](#) I don't.

Del. Doyle: [00:08:19](#) Thank you. Uh, and, and as background, what had happened here was, two of the place kickers for Vanderbilt, were injured. And the, the woman, uh, this woman was, was a first-rate soccer player and a number of the male football players went to the coach and said, "Listen, we need a kicker and she can do it." This would be prohibited for a high school in West Virginia. Is that correct if this bill passed?

Counsel: [00:08:44](#) I don't think so, no. Not according to Title IX.

Del. Doyle: [00:08:48](#) So you think Title IX might override this, uh, the, the statute?

Counsel: [00:08:55](#) When there is not a female sport, um, federal law-

Del. Doyle: [00:09:01](#) Okay.

Counsel: [00:09:01](#) States that a female-

Del. Doyle: [00:09:02](#) Okay.

Counsel: [00:09:02](#) Has to be allowed to play, then becomes a coed team. And so that, that and under this bill a coed team is not [crosstalk 00:09:09].

Del. Doyle: [00:09:08](#) So you're, you're . . . Yes, okay. So you are saying that federal law would trump this in that kind of a situation?

Counsel: [00:09:13](#) Yes.

Del. Doyle: [00:09:14](#) Thank you.

Chairman Ellington: [00:09:16](#) Further questions of Counsel, Gentleman from 16th.

Del. Hornbuckle: [00:09:20](#) Uh, thank you Mr. Chair. And so to piggyback off the, off the gentleman's question and the Gentleman from the 43rd. If there was a transgender male, uh, that started out life as a male, uh, one years old becomes a female and they're playing for their high school and they are competing in we'll just say, uh, swimming. And there is only a male team, will, will that individual be permitted to, to be on the, on the male team?

Counsel: [00:10:00](#) The individual was born male?

Del. Hornbuckle: [00:10:01](#) Mm-hmm (affirmative).

Counsel: [00:10:01](#) Yes.

Del. Hornbuckle: [00:10:04](#) And, and vice versa?

Counsel: [00:10:07](#) If there was, if there was a female?

Del. Hornbuckle: [00:10:09](#) Yes ma'am.

Counsel: [00:10:11](#) If there's not a female team, then that female would be allowed to participate on the male team.

Del. Hornbuckle: [00:10:16](#) So, so-

Counsel: [00:10:17](#) And then it would become coed.

Del. Hornbuckle: [00:10:19](#) Okay. So the, the, the, the, the, what the Gentleman from the 43rd said, uh, a, uh, the individual that started out as a female, uh, then became a male, was taking the hormones and all those

things, if there was no, uh, I guess there was only a, a female team, then they would, they would be able to be on that or a male team, I guess, any of the team they would have to be allowed, correct?

- Counsel: [00:10:43](#) Uh, I, I, I'm not, I didn't follow on-
- Chairman Ellington: [00:10:47](#) Clarify your question.
- Del. Hornbuckle: [00:10:48](#) The question would be, they, they would be permitted to, to participate on any team, if there was only one team. So regardless of the individual, if there was only a male team, they will be permitted to participate on a female team?
- Counsel: [00:11:01](#) The federal law is designed to help women excel in sports. So the, the way that it works if there's not a female team, that female can participate on the male, in the male sport, which then becomes coed, but it does not go the other way around.
- Del. Hornbuckle: [00:11:19](#) Okay. Okay. Thank you.
- Chairman Ellington: [00:11:26](#) Gentleman from the 19th.
- Del. Griffith: [00:11:31](#) Thank you Mr. Chairman. And I'm trying to think of scenarios here, whereby this might be um, unclear. And one is, there are many schools who have volleyball programs for girls only, would this mean that any boy who so claimed would be able to go out for the volleyball team, because there was no equivalent male team. Uh, would that be a possible scenario?
- Counsel: [00:12:01](#) No.
- Del. Griffith: [00:12:03](#) Why would that be? Uh.
- Counsel: [00:12:08](#) Currently, uh, a female sports are female sports, and males are not included in that. And this bill would preclude a person who was born male, who then identi—, that person would have to continue to play as a male.
- Del. Griffith: [00:12:23](#) Okay.
- Counsel: [00:12:24](#) Does that answer your question?
- Del. Griffith: [00:12:25](#) Yes. Thank you.
- Chairman Ellington: [00:12:27](#) [inaudible 00:12:27] the gentlemen that has been challenged before, and they were told they need to start a male team if they were gonna have the male play on it. So further questions to Counsel? Lady from 51st.

Del. Walker: [00:12:38](#) Thank you, Mr. Chairman. Thank you, Counsel. So I have a question, because we do have a foster care system here, and we do have trans individuals in that foster care system. And as you know and we all know, all of those documents don't come with the student. So, if we had a trans student in a new foster home that did not have the documents, it takes even a while to get a, a doctor's visit scheduled with how we are, so with DHHR. So would the coach assume what this person's identity is, gender?

Counsel: [00:13:21](#) According to statute, uh, in order to be admitted in the current statute, I'm on page one, the pupil has to have either a birth certificate or an affidavit of why they don't, which I think would be the secondary case, the case in this with the foster child. Um, and then they need the signed, the, if they didn't have the birth certificate, would need the physician statement.

Del. Walker: [00:13:47](#) So we would not allow this child to play because we didn't have that documentation, and they may not have a, a doctor's appointment at that time?

Counsel: [00:13:57](#) I, in order to be admitted, that's, that's the way this bill reads.

Del. Walker: [00:14:02](#) So, and I'm not sure if you can answer this question for me. What do we do with children that are born with both sex organs?

Counsel: [00:14:15](#) I do not know.

Del. Walker: [00:14:17](#) At the appropriate time, Mr. Chair, if we have anyone to answer that question?

Chairman Ellington: [00:14:24](#) [inaudible 14:23] Any further questions Counsel? Gentleman from the 43rd.

Del. Thompson: [00:14:35](#) Thank you Mr. Chairman. Counsel, on page one of the bill under, uh, section two, line 10 and 11. "So a signed physician statement indicating the pupil's sex based solely on the pupil's unaltered internal and external reproductive anatomy." So if we, I'm assuming this is if that a birth certificate cannot be obtained?

Counsel: [00:15:02](#) Correct.

Del. Thompson: [00:15:03](#) So we're gonna subject the child to go to the, a doctor and essentially show them their genitalia to prove their, what genitals they have. Is that what this says?

Counsel: [00:15:16](#) And I'm assuming that doctors have those types of exams in a [crosstalk 00:15:21].

Del. Thompson: [00:15:22](#) Well, I'm sure, I'm sure they do for medical purposes, not just to, you know, show and tell. But, um, is that, is that what that reads that they would, they would have to show their genitals to a doctor to prove their?

Counsel: [00:15:35](#) I'm not a doctor. I don't know what a doctor would require.

Chairman Ellington: [00:15:46](#) I assume the Gentleman wants to ask the chair questions.

Del. Thompson: [00:15:49](#) Yeah. (laughs)

Chairman Ellington: [00:15:50](#) Um, there are ways to tell on exam what their gender is.

Del. Thompson: [00:15:55](#) Without?

Chairman Ellington: [00:15:57](#) Well, I mean, you do an exam, pediatricians do exams all the time.

Del. Thompson: [00:16:00](#) Right.

Chairman Ellington: [00:16:00](#) Children, and-

Del. Thompson: [00:16:01](#) I'm talking about like a—

Chairman Ellington: [00:16:02](#) Adolescents, you would do an exam and they do have a physical exams at those ages too. So yes, you would probably have to determine whether it was altered or not.

Del. Thompson: [00:16:11](#) By like physical—

Chairman Ellington: [00:16:12](#) Right.

Del. Thompson: [00:16:13](#) Observation? Okay. Uh, thank you Mr. Chair and Counsel.

Chairman Ellington: [00:16:21](#) Lady from the 30th, 41st?

Del. Tully: [00:16:24](#) The uh, Counsel, do you, are you aware if the WVSSAC requires a physical, sports physical for participation in sports at the secondary level in West Virginia?

Counsel: [00:16:37](#) I don't know if it's the SSAC or the county. Um, I'll, I'll defer to the department on that.

Del. Tully: [00:16:41](#) Okay. I believe it's the WVSSAC, 'cause I think it's a pretty standard form. Actually, I have it right here. And, um, it also talks about a physical exam and it talks about actually, when you do the physical exam for the G, the genital urinary system, it talks about like actually doing a physical exam for inguinal

hernias, which are down in the groin folds for those that don't know, and also looking for bilaterally descended testicles.

So there's, those students aren't gonna be put through probably an unnecessary exam that they wouldn't already get to play sports. Would that be a correct assumption based upon this?

- Counsel: [00:17:18](#) If, if that's what it says, yes.
- Del. Tully: [00:17:20](#) Thank you.
- Chairman Ellington: [00:17:22](#) Gentleman from 26th?
- Del. Evans: [00:17:28](#) Thank, thank you Mr. Chairman. Um, are there any girls in West Virginia currently playing the high school football?
- Counsel: [00:17:38](#) I believe that the Delegate just said that there was. Maybe that was a college. I'm not sure.
- Chairman Ellington: [00:17:44](#) [inaudible 00:17:44]. Yeah.
- Counsel: [00:17:44](#) I, I'm not sure.
- Del. Evans: [00:17:46](#) I believe there definitely are. I stood on the football field this year against a team that definitely had a girl on the football field. We went to Webster County at one time, Webster County had a kicker female. So, I guess it is true that girls can play male sports.
- Counsel: [00:18:04](#) Yes.
- Del. Evans : [00:18:05](#) But males cannot play female sports?
- Counsel: [00:18:09](#) That's currently the way, the current law—
- Del. Evans: [00:18:10](#) So how does this, how does this bill then affect them, or does it affect it at all?
- Counsel: [00:18:17](#) This bill would affect those that changed their sex after birth.
- Del. Evans: [00:18:22](#) Okay. So it has nothing to do with current sex or like, like I'm a guy, I'm not going to change that. So it would not affect me?
- Counsel: [00:18:30](#) It would not affect you.
- Del. Evans: [00:18:31](#) Okay, that's all I want to know. Thank you.
- Chairman Ellington: [00:18:34](#) Further questions to Counsel? I believe by leave of the committee, we had requests from the school system. Uh, Ms.

Sarah, would you like to come on up and . . . Ms. Stewart, you've been sworn in before. I think there was a question regarding the school system, as far as what's currently practiced. Um, Gentleman from 43rd, do you have questions and Sarah, if you would just state name and title for the people listening in on.

- Sarah Stewart: [00:19:05](#) Sarah Stewart, West Virginia Department of Education.
- Chairman Ellington: [00:19:09](#) Gentleman.
- Del. Thompson: [00:19:10](#) Thank you Mr. Chairman, thank you Sarah. I appreciate you being here again. Um, So my question was, currently what is in place? This bill, it's gonna change? Uh, currently right now, if a student who was born um, biologically female, but is a, a high school student and is transitioning, identifies as a male and is transitioning taking hormones, uh, and she wants to play or he wants to play basketball. How, how is that working right now? Is that a county by county decision? Is it a school decision? Uh, is there, what, what is currently working or in place?
- Sarah Stewart: [00:19:49](#) Let me be clear that I am a representative from the Department of Education and not a representative from the WVSSAC.
- Del. Thompson: [00:19:57](#) Correct, I understand that. And I, I, I might have a question for them about that as well, but from your perspective from that.
- Sarah Stewart: [00:20:02](#) I just, I wanted to make that clear and I, 'cause I don't want to speak for them. It is my understanding, that currently there is no specific rule that address, squarely addresses, transgender student participation in extracurricular activities. Um, there are Title IX considerations that do come into play with, um, coed sports.
- And if there is only one sport at a, at a, um, particular school that, that we have to be mindful of Title IX and make sure those opportunities are made available. I do believe there is also a rule that if separate teams are maintained, for example a girl's basketball team and a boy's basketball team, that they, I believe there is an SSAC rule, SSAC guidance that directs that, um, that you play on the, on this, um, whatever sex, um, that the, that the students is, that does not address however, any transgender student issues.
- Del. Thompson: [00:21:01](#) Okay. Does your department have any policy on transgender students at all or has that not been addressed?
- Sarah Stewart: [00:21:09](#) Uh, we, um, there is currently a Fourth Circuit decision that is being appealed to the, the United States Supreme Court, dealing with, um, guidance relating to transgender students. Um, as we are in the Fourth Circuit, we are bound at least at this point, by

that guidance. The department has not put out any specific guidance, but it will just be mindful of, of the courts' um, direction in that regard. And should that change, we'll appropriately revise and advise the counties appropriately.

- Del. Thompson: [00:21:39](#) If this bill is passed and we later learn, I don't know, whether the outcome of that court decision may or may not be, could this bill then potentially be in violation of that?
- Sarah Stewart: [00:21:47](#) I don't want to speculate on what the US Supreme Court would take.
- Del. Thompson: [00:21:54](#) Right. But not speculation, but is it a possibility that this bill would be in violation?
- Sarah Stewart: [00:21:59](#) It, it could be.
- Del. Thompson: [00:22:00](#) Okay. Has, has your office received, um, calls, concerns, complaints regarding anything remotely related to this about students participating in, in sports or extracurricular activities that you know, that they're . . .?
- Sarah Stewart: [00:22:17](#) Surrounding the conversation today, no, we have not.
- Del. Thompson: [00:22:20](#) Okay. Um, that's all I have for you Sarah. Thank you. I appreciate it.
- Chairman Ellington: [00:22:28](#) Gentleman, from the 16th.
- Del. Hornbuckle: [00:22:33](#) Thank you Mr. Chair. Um, and thank you for being here today. Uh, giving your legal expertise, um, would the WVSSAC have the ability, uh, uh, to set a guideline concerning transgender participation in sports on their own?
- Sarah Stewart: [00:22:50](#) I do not want to speak for whether or not the WVSSAC— I'm not um, comfortable talking to their authorizing statute and where, where their rulemaking ability lies and ends. Potentially they could, but I think it's a better question addressed to them.
- Del. Hornbuckle: [00:23:04](#) And are they here today? Oh, I guess not. Oh, thank you.
- Chairman Ellington: [00:23:11](#) I have a copy of the uh, SSA, WVSSAC um, physical exam certificate, um, Delegate from the 41st asked that it be submitted as a, as an addendum. So, if anyone wants to look at it, they can afterwards. Lady from the 51st.
- Del. Walker: [00:23:33](#) Thank you Mr. Chairman. Thank you, Sarah for being in here. So we just heard that . . . So, I have a question. When there's a transgender student that is entering K-12 public education, do

you require besides when that student first entered school, a birth certificate and that student is going through transition, do they need to report anything to the school system?

Sarah Stewart: [00:24:00](#)

No.

Del. Walker: [00:24:03](#)

Would that WVEIS, will WVEIS change the identification of the child, once they start their transition, if that child and parent wanted that to be changed?

Sarah Stewart: [00:24:13](#)

I do not believe at the state level that we have any hard rules or regulations regarding, um, if a, a transgender student wishes to change their designation in WVEIS. Um, I believe counties perhaps have encountered this and have handled it on the local level, um, and appropriately we have not received any complaints at our office regarding that.

Del. Walker: [00:24:40](#)

Okay. Thank you very much.

Chairman Ellington: [00:24:42](#)

Further questions? Gentleman from the 65th?

Del. Clark: [00:24:49](#)

Yes. I've got a current question in regards to, um, we're hearing a lot of talk about, uh, uh, a child born as a female and is transitioning to a male.

PART 1 OF 4 ENDS [00:25:04]

Del. Clark: [00:25:01](#)

In high school, on the Board of Education, is, is it a suspendable offense for taking performance enhancing drugs?

Sarah Stewart: [00:25:15](#)

Counties do have, um, illegal or controlled substance and illegal substance abuse policies. Um, I think it should be, I rel- I hesitate to speculate and make a broad statement. If you are taking something under the supervision of a physician, um, I, I, I'm not sure. Um, there would have to be a conversation between the county board and the parents about whether or not it was appropriate. But I'm hesitant to say that a, a student that is taking something that's prescribed by a physician could then be disciplined on the school level for that.

Del. Clark: [00:25:47](#)

Okay. Um, I reserve my right to ask the same question later.

Chairman Ellington: [00:25:52](#)

Okay. Further questions of, uh, Ms. Stewart? None. Thank you, Ms. Stewart. Further questions of Counsel? Other questions? Any amendments? Lady from the 51st, uh, questions or amendment?

Del. Walker: [00:26:13](#)

Question.

Chairman Ellington: [00:26:14](#) Okay. Of who? Counsel?

Del. Walker: [00:26:15](#) Yeah. Can we get, um-

Chairman Ellington: [00:26:19](#) Speak into your mic, please. I can't hear you.

Del. Walker: [00:26:21](#) Can we get someone from, uh, Fairness West Virginia? I have some questions for you. Thank you.

Chairman Ellington: [00:26:27](#) By leave of the committee. Would you state your name and title, sir? I know you've already been sworn in.

Andrew Schneider: [00:26:34](#) Thank you. Um, my name is Andrew Schneider, and I'm the Executive Director of Fairness West Virginia.

Chairman Ellington: [00:26:40](#) All right Mr. Schneider. Lady from the 51st has a question.

Del. Walker: [00:26:43](#) Thank you, Chairman Ellington. Thank you, Andrew, for being here.

Andrew Schneider: [00:26:45](#) Thank you.

Del. Walker: [00:26:46](#) Can you tell me if any trans women have dominated any sporting events?

Andrew Schneider: [00:26:53](#) Not one athlete who has transitioned has been successful at the highest levels of sport. The lack of success is a strong indication of the fairness of permitting transgender women to compete against cisgender women. In fact, the problem with these bills is that they, they say that all boys are stronger than all girls. And that is just incorrect.

Uh, the, look at a young woman from North Carolina named Heaven Fitch, who won the high school state wrestling championship last year. I bring this story up because Heaven is a ci- is a cisgender girl, and yet she beat a bunch of cisgender boys. Young girls have many skills that are better than young boys.

What counts as an advantage may shift dramatically depending on the sport. For example, factors such as height, weight, and reaction time all affect a participant's advantage depending on the sport.

A young woman on the volleyball team may be very tall, and yet few people would consider that to be an unfair competitive advantage in her sport. Similarly, a man on the swimming team may have a naturally high hemoglobin count, enabling him to

take in more oxygen, but he would not be barred from swimming for that reason.

Some cisgender women, like Olymp- Olympic athlete Caster Semenya, naturally produce high levels of testosterone compared to other cisgender women. All bodies are different, and there is no single physical trait that determines if a student will excel in a sport.

Del. Walker: [00:28:27](#) Do you know if this has ever occurred in West Virginia? Have you received any calls from anyone in assistance with?

Andrew Schneider: [00:28:38](#) We have not. This appears to be a, a solution in search of a problem. Uh, there is no, uh, as I said before, there is no, uh, pattern or examples of, uh, transgender women dominating school sports in West Virginia.

Del. Walker: [00:28:59](#) Do you know how many, um, transgender persons that we have playing any sports in West Virginia, K through 12? Or secondary sports, sorry.

Andrew Schneider: [00:29:11](#) I, I'm not aware of, that, that data, that number. Um, and I don't know who would, or if that, that kind of statistic is even kept, um, by our secondary schools. Um, but I would imagine there's not many, and clearly it's not an issue, because we, no one has received any complaints about it. I mean, these, these bills come from national organizations that-

Chairman Ellington: [00:29:39](#) Um, limit to the question please.

Andrew Schneider: [00:29:41](#) Okay, sorry.

Del. Walker: [00:29:41](#) Thank you.

Chairman Ellington: [00:29:42](#) I, I told you beforehand, we're not going into a prepared speech.

Andrew Schneider: [00:29:45](#) Okay.

Del. Walker: [00:29:47](#) Thank you, Mr. Schneider.

Andrew Schneider: [00:29:47](#) Thank you.

Chairman Ellington: [00:29:49](#) Further questions [inaudible 00:29:50]? Gentleman from the 16th?

Del. Hornbuckle: [00:29:53](#) Thank you, Chairman Ellington. At the appropriate time, I'd like to ask somebody from the civil liberties group.

Chairman Ellington: [00:29:59](#) Any further questions for Mr. Schneider? All right. Mr. Baumwell, you, uh, have been sworn in. If you would name your name and title.

Eli Baumwell: [00:30:13](#) Uh, thank you, Chairman Ellington. My name is Eli Baumwell and I'm the policy director for the American Civil Liberties Union of West Virginia.

Chairman Ellington: [00:30:19](#) All right. Gentleman from the 16th has a question. Question? Gentleman from the, uh, 16th?

Del. Hornbuckle: [00:30:29](#) Thank you, Mr. Chair. Um, and thank you for being here today, sir. Uh, I got a couple of questions for you. We'll try to be brief. Uh, how will this, uh, affect the state's obligations under Title IX?

Eli Baumwell: [00:30:39](#) Uh, Delegate, I do believe, looking at this legislation, it does risk, um, a significant amount of federal funding under Title IX. Um, looking at federal courts, um, as I've looked at some of this legislation, Idaho was enjoined from this, and as Counsel mentioned, um, here in the Fourth Circuit, following the Bo-Bostock ruling, um, we have, we have got Fourth Circuit ruling saying that transgender individuals have to, have to be given, um, access to space based on their gender identity. That's Bo-coming from Bostock.

There's also now federal executive orders, um, following from those, those ruling in in alignment, rather, with those. Um, so we do risk violating Title IX based on these federal court rulings.

Del. Hornbuckle: [00:31:25](#) Uh, when you speak about violations, uh, per any civil law, are there any privacy concerns here with students?

Eli Baumwell: [00:31:32](#) There are potential privacy concerns. While students, um, may have to go under, undergo medical examinations to clear them for sports, um, having to disclose, um, whether it be their birth sex or any, uh, gender affirming therapy they might be undergoing is a violation of their potential, is a potentially violation of their privacy.

Del. Hornbuckle: [00:31:48](#) Okay. Uh, uh, legally could this have a negative impact on any other students?

Eli Baumwell: [00:31:55](#) This particular legislation is tailored solely to, um, athletics. Uh, looking at this particular, um, bill that just originated. Um, other, other pieces of legislation have been more broad, but this one is limited just to athletics.

Del. Hornbuckle: [00:32:11](#) Uh, has there been any case law on, uh, deni- denial of participation leading to any type of, uh, mental health issues with transgender youth?

Eli Baumwell: [00:32:21](#) Well, absolutely. There, there's been a lot of, um, research rather. I, I shouldn't say there's case law. But there is a lot of research into, um, the, the mental health of trans youth and what can be done to protect their mental health. And being treated, um, based by their gen- gender identity and being an op- given an opportunity to, um, participate in sports and participate in social activities has certainly been linked with better, uh, mental health outcomes, both in the short and long term.

Del. Hornbuckle: [00:32:53](#) All right. Thank you.

Chairman Ellington: [00:32:55](#) Further questions for Mr. Baumwell? None? Thank you, sir.

Eli Baumwell: [00:33:01](#) Thank you.

Chairman Ellington: [00:33:01](#) Further questions of any of the other witnesses? Gentleman from the 65th, who are you?

Del. Clark: [00:33:06](#) Do we have anybody from the, uh, West Virginia SSAC here?

Chairman Ellington: [00:33:09](#) Uh, unfortunately, they are over on our Senate colleagues' side, uh, working on a bill that's over there at the moment.

Del. Clark: [00:33:15](#) Okay.

Chairman Ellington: [00:33:17](#) Further questions? Any further questions of Counsel? Chair hears none. Any amendments? None? Chair recognized Vice Chair for motion.

Vice Chair: [00:33:29](#) Mr. Chairman, I move that originating House Bill relating to participation in single-sex secondary school winter scholastic athletic events be reported to the floor, with the recommendation that it do pass.

Chairman Ellington: [00:33:42](#) Gentleman uh, moved that, uh, House Bill originating on participation in single-sex secondary school ath- interco- interscholastic athletic events be reported to the floor with a recommendation it do pass. Is there any questions or discussion? Gentleman from the 43rd.

Del. Thompson: [00:34:00](#) I, I have a . . . Thank you, Chairman Ellington. I have a question. Would it be possible to, uh, lay this over until we could speak to someone from the, the SSAC? To like, actually hear from how that, s- since that is their, kind of, you know, what they kind of control and govern, since that would affect them?

Chairman Ellington: [00:34:19](#) Are you moving to lay it over?

Del. Thompson: [00:34:21](#) Yes.

Chairman Ellington: [00:34:22](#) If you move to lay it over, then I guess-

Del. Thompson: [00:34:23](#) Just one day. Or the next meeting.

Chairman Ellington: [00:34:25](#) Well, we don't have one day. (laughs) Um.

Del. Thompson: [00:34:29](#) We don't have one day?

Chairman Ellington: [00:34:30](#) Well, we don't have a meeting tomorrow.

Del. Thompson: [00:34:32](#) Oh, it's Wednesday. Thursday.

Chairman Ellington: [00:34:37](#) Gentleman moves that we lay this over. That takes a vote and it's non-debatable. So all in favor would say aye.

Del. Thompson: [00:34:43](#) Aye.

Chairman Ellington: [00:34:44](#) Those opposed, nay. I would say nays have a-

Del. Thompson: [00:34:49](#) Division?

Chairman Ellington: [00:34:50](#) Well, he had the s- he had the, uh, microphone, so [inaudible
[00:34:53](#)]. (laughs)

Del. Thompson: [00:34:56](#) Thank you. That worked. (laughs)

Chairman Ellington: [00:34:58](#) I could have used my microphone, too. So motion r-

Del. Thompson: [00:35:02](#) I did call division, though.

Chairman Ellington: [00:35:03](#) Motion, uh, rejected.

Del. Thompson: [00:35:05](#) Could I call div- I called division.

Chairman Ellington: [00:35:07](#) I think I had already called it, but. Well, okay, we'll call division. Is it sustained? All right, we have it sustained. The clerk will call, call the vote on that. So, if you vote yay, that means we lay it over. If you, uh, vote nay, that means it is rejected. All right.

Well, those that are in favor of the Gentleman's, uh, motion to lay it over, raise your hands. That's six. Yeah. There's six.

All right. Those, uh, those opposed to the Gentleman's motion, raise your hands. All right, six to thirteen. All right, motion rejected.

Any further amendments? Or actually, we're on discussion. Gentleman from the, uh, 60-uh-7th?

Del. Doyle: [00:36:27](#)

Uh, uh, thank you, Chairman Ellington. Um, I oppose the bill for, for, for two reasons. First, uh, in our questions of Counsel, uh, I think it became pretty obvious that, uh, we're on rather dangerous legal ground r- uh, relating to the feds if we pass this bill a- as it is written. So that is one.

A- also, uh, uh, the one, uh, person who testified, the gentleman from Fairness, mentioned, uh, something that I had heard before, as one of the arguments in favor of this, and that is that males are inherently stronger than females. And I, I just have a, a vignette I'd like to, uh, to go over. I've remembered this ever, ever since it happened.

When I was a, a rifle platoon leader in Vietnam, I had a guy in my platoon that weighed barely 100 pounds. He had no upper body strength whatsoever. And the rules were, we have two, what are called, uh, uh, uh, heavy machine guns there, uh, uh, uh, 7.62 machine guns, it's roughly a 30 caliber for those people who are not into metrics. And you had to carry that and 200 rounds of ammunition, and he couldn't carry it.

So, whenever it was his turn, somebody else just volunteered. I am a big time women's college basketball fan, and I'm telling you, every time I see a game, there are people out there playing that could have easily carried that machine gun and 200 rounds of ammunition.

So that's why, uh, I think is p- another part of the reason I think this is a bad bill, and I'm going vote no. Thanks.

Chairman Ellington: [00:38:06](#)

Anyone else wish to speak? Gentleman from the 43rd?

Del. Thompson: [00:38:11](#)

Thank you, Chairman Ellington. I also want to speak a- against this bill for a multitude of reasons. First, because, I mean, I would like to hear from the SSAC of how this would, you know, uh, impact their rules and impact and see, have a better understanding of how this would be implemented.

I'm also going speak against it for the reason, and I ask what I asked Counsel, pertaining to, if I have a daughter, and she's playing basketball, and she's on a basketball team, and with this bill, um, a person who was born female, identified as male, was taking testosterone, is transitioning, is going to be on the same

team as my daughter, outperforming her, because my daughter is not taking testosterone, this is not, this is not going to be fair to the children of West Virginia.

I under, were there, whatever side you fall on this, it's not, that's not fair. Uh, and also, I have a major problem, and as the, the Lady from the 41st mentioned about the, the sports physicals, I played basketball and baseball through middle and high school, and um, I, I had to do a physical every year, but I never once, uh, was subjected to, I guess I could've been, to the, the hernia check. So, I have a major problem with forcing children, middle school children or high school children, uh, to, for this purpose, to specifically . . . If it's for a medical reason, I totally understand it and get it, but just to par- just to prove their gender, I don't think that's right. And I don't think any of us would want our children subjected to that.

Uh, so for those reasons, I, uh, strongly, uh, do not support this bill, and I urge you all to do the same. Thank you.

Chairman Ellington: [00:39:55](#) Anyone else wishing to speak to the bill? Lady from the 41st.

Del. Tully: [00:39:58](#) I'm just want to give a point of clarification, actually, on the addendum, the thing that I provided from the WVSSAC that was the addendum. It was revised in May of 2016, so I don't know when the hernia checks, uh, first originated, but I don't . . . You probably graduated well after 2016, I would assume, sir.

Chairman Ellington: [00:40:22](#) Anyone else wishing to speak to the bill? All right, before us is the motion. All those in favor would say aye. Those opposed, nay. Gentleman from the 53rd?

The Chair is undecided, so uh, let's do that again. All those in favor say aye. Those opposed, nay. (laughs) Got a loud group there. Okay. Division has been called. Yeah, I'm still undecided on that.

So, division. All those in favor, raise your hands. [inaudible 00:41:18] Those opposed, raise your hands. Fifteen, six? Fifteen to six. Motion adopted.

Next thing on the agenda is House Bill 2364. Any interest in the bill?

Exhibit 36

West Virginia House of Delegates Judiciary Committee Discussion of H.B. 3293

March 18, 2021

- Chairman Capito: [00:41](#) . . . left on the agenda. The bill is 3293. We have a guest presenter with us. We're happy to have her back with the co-with the committee today. And whenever she is ready, she may proceed.
- Counsel: [00:56](#) I thank you Mr., Mr. Chairman. This committee substitute provides that for the purposes of participating in Single Sex Secondary School Interscholastic Athletic events, under the controlled supervision and regulation of the Secondary School Acti- Activities Commission, each county school district shall confirm that the sex of the people identified, on the pupil's original birth certificate provided on his or her admission to public school is the pupil's sex at the time of birth.
- If an original birth certificate was not provided or if the birth certificate provided does not indicate the pupil's sex at the time of birth, a signed physician's statement indicating the pupil's sex based solely on the pupil's unaltered, internal and external reproductive anatomy must be submitted prior to the pupil's participation in single sex secondary school interscholastic ac-ac- athletic events. Prior to the student's participation in single sex inter- secondary school interscholastic athletic events, the SSAC must verify with each county board that each student participating in Single Sex Interscholastic events is participating according to the student's sex at the time of birth. This requirement does not apply to co-educational, uh, sports. And that's a summary of the bill.
- Chairman Capito: [02:15](#) Thank you very much, Counsel. I appreciate that presentation. Are there questions for Counsel? Are there questions? The Lady from the 4th.
- Del. Zukoff: [02:26](#) Thank you Mr. Speaker. Do you know if there's any federal re-any federal, um, any federal courts looking at this, um, issue currently?
- Counsel: [02:36](#) Yeah. There is a case, uh. Grimm versus, I'm not sure I'm going to pronounce the, Glo- Glo- Gloucester County School Board. It's a Fourth Circuit case. It's, it has to do with, uh, a student, uh, transgender male's right to use a male bathroom.
- Del. Zukoff: [03:00](#) Okay. Nothing involving sports, though?
- Counsel: [03:06](#) It, it does not, uh, does not-
- Del. Zukoff: [03:07](#) Specifically?

Counsel: [03:08](#) . . . directly a- uh, state anything about sports.

Del. Zukoff: [03:11](#) Okay. Have we had this come up before the Department of Education? Have we had any issues around this, this bill that, transgender students participating in sports come before the Department of Education as a concern?

Counsel: [03:26](#) It is my understanding that there have been no problems on the county level.

Del. Zukoff: [03:26](#) Okay. I checked with mine and there weren't. That's why I was just curious if you knew from a statewide perspective.

Counsel: [03:28](#) That's what they'd indicated to me. There had been no problems.

Del. Zukoff: [03:39](#) Thank you.

Chairman Capito: [03:40](#) Gentleman from the 37th.

Del. Pushkin: [03:44](#) Thank you, Mr. Chairman. Thank you, counsel. Um, and I'm sorry I missed the first part of the, of your, uh, presentation of the, uh, of the bill here. But would this preclude a female student from participating in a male sport?

Counsel: [03:59](#) No.

Del. Pushkin: [04:00](#) It would not?

Counsel: [04:01](#) No. Under Title IX, a female has to be allowed to participate in a sport. So, if the, for instance, there are no female football, then the female would be allowed to play in, uh, football, um.

Del. Pushkin: [04:15](#) All right. And that would be, I mean the only case I can, cases in West Virginia I could think of would be in sports where there aren't female sports that, that the, that the girls participate in the boys sports. That's the only time I've ever heard of it even happen, anything like this happening in West Virginia.

Counsel: [04:29](#) It's my understanding there have not been any issues. I, and the, the re- the executive director of the SSAC is here if anyone wants to talk to him. But I believe there are only, the only solely female sports are volleyball and softball.

Del. Pushkin: [04:46](#) So this only affects those two sports?

Counsel: [04:46](#) Well, well it would affect the single sex. So, in other words, you have single sex—you have women's basketball and, and men's basketball or-

Del. Pushkin: [04:53](#) Yeah.

Counsel: [04:54](#) . . . and-

Del. Pushkin: [04:55](#) Okay.

Counsel: [04:55](#) . . . track-

Del. Pushkin: [04:55](#) I got you. I got you.

Counsel: [04:56](#) Two, two sets. Yeah.

Del. Pushkin: [04:56](#) I got you.

Counsel: [04:56](#) Yeah.

Del. Pushkin: [04:58](#) Okay, thank you.

Chairman Capito: [05:00](#) Further questions of Counsel? Further questions of Counsel? Chair, recognize Gentleman from the 17th.

Del. Lovejoy: [05:07](#) Thank you, Chairman Capito. Good afternoon, Counsel. Uh, you mentioned that Grimm case. I tried to read a little bit about it, uh, for today. So that was a Fourth Circuit case, um.

Counsel: [05:07](#) Mm-hmm (affirmative).

Del. Lovejoy: [05:17](#) The Fourth Circuit is a federal Circuit Court of Appeals. It includes the state of West Virginia, right?

Counsel: [05:23](#) Correct.

Del. Lovejoy: [05:24](#) And in that case, um, this was not a sports case but it, it dealt with the requirement to use facilities on a school ground with the sex assigned at birth. Is that fair?

Counsel: [05:39](#) It did.

Del. Lovejoy: [05:40](#) Okay.

Counsel: [05:41](#) Uh, the, the, uh, Grimm was born a female and wanted to us- and was transitioned to male, and wanted to use the male bathroom.

Del. Lovejoy: [05:50](#) So in that case, the court, the Fourth Circuit, um, found that the student's, uh, rights had been violated under Title IX, right?

Counsel: [06:02](#) Yes.

Del. Lovejoy: [06:03](#) And also, I think second, second basis was under, was it equal protection?

Counsel: [06:08](#) Yes.

Del. Lovejoy: [06:08](#) And so, what, what, you know, if we're to do something like this and we have a lawsuit come under Title IX, what are the consequences of a school board in West Virginia being found, like that case, to violate Title IX? I mean what, what's the, what are the consequences?

Counsel: [06:26](#) Well, uh, the schools receive federal funds. So that is, they're, they're required to follow the federal guidelines, which would include the Fourth Circuit. Um, there is also a recent executive order, um, and so the, the, the s- the board, or the department would, is required to follow federal guidelines. So, um, I think the practical effect would be that under the Fourth Circuit case, uh, which is currently there has been a writ filed before the Supreme Court and, um, Grimm has ex- has, uh, petitioned for additional time to answer. And that is the current procedural history right now with that. Um, so in other words, you know, the, the Supreme Court may or may not take the case. If they do, then Fourth court c-, Fourth Circuit would be controlling. If they did take the case, then of course they would issue an opinion.

Um, but un- as it stands right now, the department would be bound to if a transgender person wanted to use, for instance, a transgender female wanted to use a female bathroom, they would have to allow that transgender female to use the, the female bathroom under this Fourth Circuit case. But the, the bill, the, they would have to play a different sport.

Del. Lovejoy: [07:47](#) So, so let me understand the posture. The Fourth Circuit Court of Appeals has rendered a decision that as it stands now, found that school's policy in, in the bathroom context as opposed to the sports context, to violate Title IX.

Counsel: [08:04](#) And, and they did not, um, deal with sports specifically and the, that particular person was not involved in sports. So, it did not deal with locker rooms or sports because he was not involved in sports.

Del. Lovejoy: [08:14](#) But the basis of that opinion was the Bostock case, is that what it's called?

Counsel: [08:19](#) That was one of the cases that was, yes, quoted.

Del. Lovejoy: [08:22](#) Bostock was not, was neither a sports nor a bathroom case, right?

Counsel: [08:25](#) I haven't read that entire case. I just-

Del. Lovejoy: [08:28](#) But it's employment case. Yeah.

Counsel: [08:29](#) . . . did but, yeah. It, in a, I believe a Supreme Court case. Yes.

Del. Lovejoy: [08:31](#) Right.

Counsel: [08:32](#) Yes.

Del. Lovejoy: [08:32](#) Yes. And so, it's a, it's a, it's a 2020 case and it deals with employment discrimination and the Fourth Circuit applied the holdings in the employment discrimination decision of Bostock to apply to the restroom question. And so, if the Fourth Circuit were to also apply that to this situation, we could be passing a law that puts us in violation of Title IX?

Counsel: [09:00](#) I mean, it, it, there, there would be a, a question perhaps. I mean, it, there's a slippery, this, this is literally something that is changing every day across the United States. I mean, literally every time I'm, I go on the internet, there's something different happening. So, um, you know, who know, it's hard to say what a court is going to do. But, you know, it, it is, I think pretty safe to say that something like this would be up for, um, liti- litigation because it is being litigated-

Del. Lovejoy: [09:33](#) Yes.

Counsel: [09:33](#) . . . throughout the country daily. I mean-

Del. Lovejoy: [09:35](#) Yes. And we're going to have some guidance soon, won't we?

Counsel: [09:35](#) I'm, I-

Del. Lovejoy: [09:38](#) With Fourth Circuit, right?

Counsel: [09:39](#) Yeah. I mean, ma- uh, yeah. I guess we'll see what the Supreme Court-

Del. Lovejoy: [09:44](#) We have a decision from the Fourth Circuit-

Counsel: [09:44](#) Mm-hmm (affirmative).

Del. Lovejoy: [09:46](#) . . . and we're s- we're at, somebody's at the doorsteps of the United States Supreme Court saying, "We'd like you to take this up on a, on a writ of cert and that decision has not been made yet." But we will know the results of that decision by the US Supreme Court at some point in the, maybe near future, right?

Counsel: [10:02](#) We would, yes.

Del. Lovejoy: [10:04](#) Okay. Um, okay. In addition to losing federal funding if you're found to violate Title IX, um, is the successful claimant also entitled to money damages?

Counsel: [10:17](#) Uh, in this case, uh, I believe the way I read the case, uh, the, Grimm received \$1. I mean, it was not a money case.

Del. Lovejoy: [10:26](#) Well, did they also receive an award of attorney's fees?

Counsel: [10:28](#) Attorney's fees, yes.

Del. Lovejoy: [10:29](#) Yes, which were more than \$1.

Counsel: [10:30](#) I'm sure.

Del. Lovejoy: [10:31](#) Yeah, um. And so, if for instance, we pass a law that before the Supreme Court rules on the case up there, uh, on the writ, that also is found to violate Title IX, then we could lose our, our federal funding and be on the losing end of litigation in a fee shifting situation, right?

Counsel: [10:51](#) I-

Speaker 6: [10:51](#) One point of order, point of order, Chairman Capito.

Chairman Capito: [10:55](#) Gentleman will state his point of order.

Speaker 6: [10:56](#) Um, uh. My friend is, uh, asking Counsel, number one, to speculate and number two, to offer personal opinions. Uh, neither of which are technical in nature so, uh, I would ask the line of question be, uh, prohibited.

Chairman Capito: [11:12](#) [crosstalk 00:11:12] well I would just, I would just say the chair's ruling is that the, uh, the Gentleman will, will, will stick to the thrust of the bill. I think the Gentleman is asking counsel to make, uh, a legal assessment of a, of a Fourth Circuit opinion, um, and I think it's, uh, appropriate. Uh, and I think it's appropriate for her to make that distinction as Counsel, so I'll allow question to continue.

Del. Lovejoy: [11:32](#) Thank you Mr. Chairman. Um, and I'll try to keep it cleaner. If we pass a law that violates Title IX of the federal law, then the result of a violation is a loss of federal funding. That is a, that is a true statement of the law?

Counsel: [11:47](#) I don't know the particular, um, process for loss of funding. I mean, I would hope that, um, it wouldn't be, and you know, I

mean, I would say that there would be a process for that. I don't know. I don't think that-

- Del. Lovejoy: [12:00](#) Can I restate as, can or may? If I say that, would that be a fair statement, that you can lose your federal funding if you pass laws that violate Title IX?
- Counsel: [12:11](#) It's my understanding that the funding the federal government supplies is based upon the assumption that the laws that it enacts will be followed.
- Del. Lovejoy: [12:21](#) Okay. Thank you very much. Thank you, Mr. Chairman.
- Chairman Capito: [12:24](#) Further questions of Counsel? Gentleman from the 37th, did you have questions of Counsel?
- Del. Pushkin: [12:29](#) At the appropriate time I'd like to ask you now just to take leave of committee for a, a testimony from, uh [crosstalk 00:12:35]-
- Chairman Capito [12:34](#) At the appropriate time. Chairman from the 50th for counsel. I recognize Gentleman from the 50th.
- Del. Garcia: [12:40](#) Thank you, counsel. So, when I look at page two of, uh, let's see, what section is this, p- yeah, page two, line 26, subdivision E of section, it's on another page, 5C, um, it appears that—there's a proviso related to if somebody does not, is not able to provide a birth certificate or their birth certificate does not indicate a sex at the time of birth, correct?
- Counsel: [13:21](#) I'm, I'm sorry. Can you rephrase that again? I see where you-
- Del. Garcia: [13:23](#) Yeah, yeah.
- Counsel: [13:24](#) What was your question again? I'm sorry.
- Del. Garcia: [13:24](#) So, so that relates to—the proviso relates to a situation, um, if someone is unable to provide their original birth certificate or their birth certificate as it states here, does not indicate people's sex at the time of birth.
- Counsel: [13:39](#) So, yeah. If you look at page one, the first paragraph, when a student is admitted to a public school, they are to provide a birth certificate. So it goes, it's referring back to that birth certificate. But if, for, for it, but there's also, if the birth certificate cannot be provided, then they have to say, have to have an affidavit proviso. So in the case that their birth certificate was not a, supplied or the, the sex was not identified, then that proviso for

the, uh, doctor's affidavit, I mean doctor's statement would apply. Does that answer your question?

Del. Garcia: [14:14](#) That do- well that doesn't and kind of continuing on further. So, if, if a birth certificate is not provided or if the birth certificate does not indicate the people's sex at the time of birth, I just want to make sure I'm understanding this correctly. So, the, the physician statement that they have to, I guess, they have to figure out about whether the person has unaltered internal and external reproductive anatomy?

Counsel: [14:51](#) That's what it says, yes.

Del. Garcia: [14:52](#) So, the, that means that anybody who can't fulfill, who can't provide their birth certificate has to undergo an examination, I would imagine some type of genital examination, by that doctor?

Counsel: [15:10](#) Well, all of the students are required to have a physical exam to ta- I mean, to participate in sports.

Del. Garcia: [15:17](#) But does that necessarily include . . . I mean, you know, again, internal and external reproductive anatomy. I, that, is that something that's normally part of a physical?

Counsel: [15:33](#) I don't know.

Del. Garcia: [15:35](#) And, and whether it's unaltered. That's, that's what this bill states.

Counsel: [15:40](#) That it does, yes.

Del. Garcia: [15:43](#) What happens if, if a student has both male and female reproductive anatomy?

Counsel: [15:58](#) The bill doesn't address that.

Del. Garcia: [16:03](#) That, and, and that's my understanding is, one or 2% of the population of the United States, that, that is, you know, that's, that happens. That's probably not a good, good question for counsel. That's, I didn't really ask a question, so I apologize. That's, that, those are, those are the questions that I have. Thank you.

Chairman Capito: [16:25](#) Thank you. Further questions of Counsel? Further questions? I, I had the gent- gent- excuse me, I had the Lady from the 4th followed by the Gentleman from the 13th.

Del. Zukoff: [16:35](#) Thank you, Mr. Chairman. Just one last question. You had mentioned when you're answering the Gentleman from the

17th's question that there's an executive order currently that addresses this issue. Could you give us-

- Counsel: [16:48](#) Oh, I'm sorry. It do- it, there's an executive order that has to do with, um, from, uh, March 8th.
- Del. Zukoff: [16:56](#) An executive order from?
- Counsel: [16:58](#) The President, President Biden.
- Del. Zukoff: [17:00](#) Okay. And what does that say?
- Counsel: [17:04](#) It is guaranteeing an educational environment free of discrimination on the basis of sex, including ori- sexual orientation and g- or gender identity.
- Del. Zukoff: [17:16](#) Okay. Thank you.
- Chairman Capito: [17:19](#) Gentleman from 13th.
- Del. Zukoff: [17:20](#) I didn't know that.
- Del. Pinson: [17:21](#) Yes, thank you Mr. Chair, thank you Counsel for your presentation of the bill that's before us. Uh, couple quick questions. I know the question was asked to you, has there been issues of this within the boundaries of our state and I believe that you answered that you weren't aware of any. I'm aware that we do have someone from the SSAC here that could either provide the same answer or their own opinion. Is that correct?
- Counsel: [17:51](#) Yes, someone, uh, the Executive Director is here.
- Del. Pinson: [17:54](#) Okay. I'll ask you this. In your preparation of the bill, were you able to find instances in other states where questions surrounding the legality of this same issue have been raised?
- Counsel: [18:15](#) Yes.
- Del. Pinson: [18:16](#) Okay. Uh, turning my attention now to the Gavin Grimm case out of Virginia, if I understood your assessment of, of that legal proceeding, the county school board, and I'm not going to try to pronounce it either, they were found to have violated Title IX based on the, the circumstances and the facts surrounding that particular case. Is that correct?
- Counsel: [18:53](#) Yes, they were.
- Del. Pinson: [18:55](#) And-

Counsel: [18:55](#) Under that case, yes. And under those circumstances, they were.

Del. Pinson: [18:55](#) So-

Counsel: [18:58](#) And equal protection.

Del. Pinson: [19:00](#) Thank you. And we, that case did not deal with the legality of transgender athletes at all. We're dealing with something completely separate from that. Is that correct?

Counsel: [19:14](#) It did not deal with sports and it said in there that, that issue was not raised because he did not play sports.

Del. Pinson: [19:21](#) Okay. That will be all. Thank you. Thank you, Mr. Chair.

Chairman Capito: [19:23](#) Further questions of Counsel. Further questions of Counsel. Uh, Counsel, question from the chair. Under, uh, I understand I think, uh, part, partially the holding in Grimm, um, that it, that, that the, the Grimm's equal protection rights were violated that he was not able to access the men's bathroom. Was, was he, is, is Grimm still able to access to women's bathroom?

Counsel: [19:51](#) Uh, initially they, uh, had him using the nurse's bathroom and, but there was, it was inconvenient. It sometimes made him late for classes. And so, then they fashioned a separate, um, bathroom for transgender, uh, people and, or, or they redid the stalls. I, I'm-

Chairman Capito: [20:15](#) Was he prohibited-

Counsel: [20:15](#) But they, they fashioned [crosstalk 00:20:17]-

Chairman Capito: [20:17](#) Was he prohibited from using the women's bathroom?

Counsel: [20:18](#) It, it, uh, he, this was a transgender male who was an original female.

Chairman Capito: [20:18](#) Right.

Counsel: [20:18](#) He was put-

Chairman Capito: [20:24](#) Right.

Counsel: [20:24](#) . . . prohibited from using the male bathroom.

Chairman Capito: [20:26](#) Right. Was he prohibited from using the female bathroom?

Counsel: [20:29](#) No.

Chairman Capito: [20:30](#) Okay. With the holding, is he permitted to use either bathroom still?

Counsel: [20:36](#) Uh, it, the holding-

Chairman Capito: [20:38](#) If you don't have that, I understand-

Counsel: [20:39](#) Let, I mean my, my, well let, let me say he's in college now. So-

Chairman Capito: [20:39](#) Okay.

Counsel: [20:43](#) . . . this went on for five years.

Chairman Capito: [20:44](#) Okay.

Counsel: [20:44](#) So, um, it's, it, he's not in high school anymore but-

Chairman Capito: [20:50](#) Okay.

Counsel: [20:50](#) . . . essentially he, if the, the, he was able to use the bathroom that he identified, that-

Chairman Capito: [20:56](#) I understand, I understand-

Counsel: [20:56](#) Yeah.

Chairman Capito: [20:57](#) . . . the thrust of the, of the whole thing.

Counsel: [20:57](#) Mm-hmm (affirmative).

Chairman Capito: [21:00](#) I just was curious. Questions?

Counsel: [21:00](#) Yeah.

Chairman Capito: [21:02](#) The Gentleman from the 37th desires leave of the committee to call a witness. Is that witness on the screen? Oh yeah, okay. Uh. (laughing) Are, are you, uh, able to hear us?

Cathryn Oakley: [21:15](#) I am able to hear you.

Chairman Capito: [21:17](#) Okay.

Cathryn Oakley: [21:17](#) Are you able to hear me?

Chairman Capito: [21:19](#) We can hear you. Would you please introduce yourself to the committee and, uh, who you are here representing?

Cathryn Oakley: [21:35](#) Yes, definitely. I'm [inaudible 00:21:35]. Hold on one second.

Chairman Capito: [21:35](#) Mark, go up and mute that.

Mark: [21:37](#) Should I mute that computer? Well, then she won't be able to hear us.

Chairman Capito: [21:39](#) Yes, you're right.

Cathryn Oakley: [21:40](#) Yeah, I can hear you. What, I'll turn my volume down while I'm introducing myself and then I'll turn it back up so I can hear you. Um, my name is Cathryn Oakley and I am the, uh, State Legislative Director and Senior Counsel at the Human Rights Campaign. Um, the Human Rights Campaign is the nation's largest organization working for equality for the LGBTQ community. Um, and I'm here on behalf of our more than three million members and supporters nationwide, including many in West Virginia, um, in opposition to the bill. And I stand ready to answer questions and, and also provide a brief statement if you allow.

Chairman Capito: [22:19](#) Thank you very much, Ms. Oakley. We appreciate you taking time on your Friday to be with us, as they say. So if you would, please raise your right hand. We'll swear you in. Then we'll allow questioning. Would you please raise your right hand? Do you swear to tell the truth, the whole truth and nothing but the truth?

Cathryn Oakley: [22:34](#) I do.

Chairman Capito: [22:38](#) Thank you very much. Chair recognize chairman from 37th for questions.

Del. Pushkin: [22:41](#) Thank you, Mr. Chairman.

Chairman Capito: [22:43](#) Hm? Oh.

Del. Pushkin: [22:44](#) Thank you, Mr. Chairman and, um, thank you for, uh, attending, uh, uh, the, uh, whatever service we're using now, uh, Ms. Oakley. Can you hear me?

Cathryn Oakley: [22:53](#) I can. Thank you so much for having me and, um, and to Mark for facilitating my being able to be here.

Del. Pushkin: [22:59](#) Okay. And, um, so you've, you, I guess you followed cases like this throughout the country, right? That's, that's part of your job at the Human Rights Campaign, is that correct?

Cathryn Oakley: [23:09](#) That's correct.

Del. Pushkin: [23:10](#) Okay. Have you, there was asked of Counsel and, and she didn't know of anybody. Do, do you know of any cases in West Virginia?

Cathryn Oakley: [23:18](#) I do not know of any cases in West Virginia.

Del. Pushkin: [23:21](#) Okay. Um, the, the, but you have . . . Well, first of all, uh, I guess this is based on a premise that a, um, a, uh, transgender athlete would have some sort of advantage over, uh, other participants. Do you, is, I'm trying, have you heard of an actual advantage being created by transgender athletes?

Cathryn Oakley: [23:46](#) Yeah. Thank you for that question. That's a really important question. And I'll preface this by saying that groups like the National Women's Law Center and, uh, the Women's Sports Foundation, Women Leaders in College Sports all support inclusive policies that allow transgender athletes to participate. Um, and I, that is because, uh, to, to your excellent point, um, transgender kids, and I, you know, particularly this conversation ends focusing on transgender girls, um, transgender girls, like all girls, uh, have a variety of different bodies. They have a variety of different talents. They have a variety of different interests.

Some of them will be tall, some of them are short. Some of them are fast, some of them are slow. Some of them will have excellent hand-eye coordination. Others of them will not. Um, and so, you know, the trans pop- the trans population is, is fairly small. Uh, if you are, really only concerned with trans girls, that's then half of that number. And then of course, of those, uh, trans girls, you're, you're talking about only a few that are going to be interested in sports, um, and have, you know, sort of the combination of interest of, of physical capability, um, mental drive, work ethic to be able to excel.

Del. Pushkin: [23:46](#) Mm-hmm (affirmative).

Cathryn Oakley: [25:00](#) And I think very much to your point, the reason that we do not actually see, uh, instances of problems, uh, in, in the states, um, even though 16 states allow trans youth to participate in sports consistent with their gender identity and have done so for many years, um, there, there are in fact not issues in the states. Um, there is one, uh, case of Connecticut which we can speak about that much has been made of.

Um, I think it's really been misrepresented what's happened in Connecticut. So, I'm happy to help, uh, diffuse some of the misinformation about that. Um, but there, this is just simply not a problem, particularly in elementary and secondary schools. Um, some of the bills that we're seeing, I know not this one, uh, deal also with collegiate athletics. So, I'll also just say that the NCAA

has had a policy for more than 10 years regulating, uh, trans, uh, participation in sports. And they also have not seen, you know, women's sports collapse as a result of, uh, people pretending to be girls in order to compete and excel.

Del. Pushkin: [26:06](#) Okay. Well I, I have a couple concerns about what the real consequences that, uh, this legislation could also have and that would, again, with my next question, um, do you have any statistics on like, about mental health issues or even suicide rates among the transgender teens?

Cathryn Oakley: [26:29](#) Yes. Um, you know, I want to preface this by saying that, uh, for transgender teens who are able to receive, um, age appropriate, medically necessary care, um, the numbers are quite different. And in fact, having just one supportive adult in a trans youth's life can make a tremendous difference. But yes, um, trans youths experience extremely high levels of anxiety and depression, um, and also have an extremely high rate unfortunately of suicide and suicidality. Um, particularly, as I say, when they are not, um, supported by adults in their lives.

Um, and we have also found by the way that there is, uh, there is true harm, um, even with bills that are, uh, are challenging trans identity, even when they're introduced but not passed.

Del. Pushkin: [26:29](#) Hm.

Cathryn Oakley: [27:24](#) The rhetoric around those bills can be extremely harmful to transgender youth who are hearing them at home.

Del. Pushkin: [27:33](#) So even though it's unlikely that, that there's going to be participation from transgender girls in sports because we haven't seen it in a whole lot of places, the bill itself could be harmful just for a group that's already extremely alienated, is what you're saying, right?

Cathryn Oakley: [27:48](#) That's exactly what I'm saying. It's that there's actually no harm here that's being addressed by a piece of legislation like this, but, uh, there's, there's no, there's no, uh, no purpose for it. But there is harm perpetrated by it.

Del. Pushkin: [27:48](#) That's what I was getting at.

Cathryn Oakley: [28:01](#) Um, and particularly should it pass, you know, it's targeting an extremely vulnerable group of youth uh-

Del. Pushkin: [28:06](#) Right.

Cathryn Oakley: [28:07](#) . . . who as you say, are already experiencing extreme amounts of discrimination. And I, I do think that when we hear this idea that

there might be boys who are pretending, um, to be transgender women in order to get an advantage, transgender girls in order to be at an advantage, um, given the amount of discrimination that transgender youth face, uh, it's, it's really, uh, extremely difficult to imagine that that's something that anybody would do.

Del. Pushkin: [28:31](#)

All right. Just a couple more questions. Um, I'm thinking now about, uh, like cisgender girls meaning a female, assigned a female at birth, identifies as a female, a female athlete, okay, who happens to be . . . Have you heard of any instances where it's a female athlete who just happens to be maybe tall, maybe, uh, more muscular than the other girls and the opposing team, or the opposing coach or opposing parents, uh, might make, uh, an accusation that, that, uh, she's not a girl? And then because of a law like this, they would like check into her background or something. Or, or it's been, being brought up because of a law like this. Have you heard of any instances of that, like that sort of thing happening?

Cathryn Oakley: [29:20](#)

Yeah. Well, it, so there, there's only, um, well now two laws, that are, have passed that are on the books about this. One of them was passed only last week and hasn't yet gone. Last week, I think it was signed. And it has not gone into effect. Um, the other is the, uh, is the similar law that passed in Idaho last year, the HB500. Um, that law has been enjoined. It was challenged, um, in, uh, in the Ninth Circuit and, um, is currently enjoined, suspended from going into effect. So, we haven't had any of these laws in place yet that would give rise to that kind of a, uh, situation.

Del. Pushkin: [29:57](#)

Ah-

Cathryn Oakley: [29:57](#)

However, certainly that would be a side effect of what these bills would do is allow for the harassment of cisgender-

Del. Pushkin: [29:57](#)

Yeah.

Cathryn Oakley: [30:06](#)

. . . girls who are simply bigger and stronger. And I'll say, I'm 5'10". You can't, probably can't tell over Zoom. Um, I've been 5'10" since I was in sixth grade. Uh, and I promise you that did not come with any kind of sports advantage, no matter what people might think. Um, but certainly, you know, this idea that cisgender girls might be harassed for, you know, going through puberty early or being the first ones to grow, uh, that is, that's absolutely, um, possible that, that, that this bill will enable, uh, harassment for those girls.

Del. Pushkin: [30:39](#)

Well your answer led me to one last question. First of all, I guess two if you count this one. You're an attorney with the Human Rights Campaign, right? You're a, you're a-

Cathryn Oakley: [30:39](#) Yes.

Del. Pushkin: [30:46](#) . . . you're an attorney? And you said this law hasn't been enacted anywhere 'cause it's in court. So, is it constitutional?

Cathryn Oakley: [30:53](#) No.

Del. Pushkin: [30:54](#) Okay. Thanks. That's all the questions I have, Mr. Chairman. Thank you very much.

Chairman Capito: [30:59](#) Further questions from Ms. Oakley? Further questions from, for Ms. Oakley? Ms. Oakley, thank you so much for being with us today. Uh, I'm sure there's nowhere else you'd rather be on a Friday afternoon.

Cathryn Oakley: [31:11](#) Never. Thank you so much. I appreciate it.

Chairman Capito: [31:14](#) Of course. Is there further desire by or of any member of the committee to call a witness, um, either that may be in the hallway or that might, uh, come to us virtually? Does any other member of the committee desire leave of the committee? Okay. If not, are there amendments to the bill? Are there amendments to the committee substitute? If not, chair recognizes Gentleman from the 32nd to move the committee substitute.

Del. Haynes: [31:45](#) Thank you, Chairman Capito. [inaudible 00:31:48] recommendation that we do that.

Chairman Capito: [31:47](#) You have heard the Gentleman's motion. Is there discussion? Gentleman from the 17th.

Del. Lovejoy: [31:52](#) Thank you, Mr. Chairman. [inaudible 00:31:53] full opposition to the bill. The timing of the bill is not the best. Um, I think that we have, this is another solution in search of the problem. But even more than that, we have legal guidance on this. We have a case from the Fourth Circuit in August of 2020 which tells you a law in this very area of Title IX. That decision is currently on appeal to the US Supreme Court. I don't know when they will rule but probably before, maybe before we get home or shortly thereafter we'll know whether the granted decision stands. Now, my friends have brought up some questions about that Grimm decision, and my good friend from the 13th said, "Well it's completely separate."

And I tell you that, that it is true the Grimm case does not deal with sports, but the Grimm case deals with the same issue. You have a school board that enacts a policy that says, students are required to use this facility, um, of the gender assigned at birth, okay. Um, and the Supreme Court, or excuse me, the Fourth Circuit struck it down, said you can't do that without violating

Title IX. So if you have a policy based on a law that says you have to use or play in the team of the gender assigned at birth, it's not that much of a leap in logic to think that the same thing would apply, especially since Grimm was based on Bostock, which is another 2020 case written by Justice Gorsuch that applied, um, uh, the Title VII of the Civil Rights Act, um, that said discrimination based on sexual orientation and gender identity in the employment context.

So, you know, if you don't think that's the way it's going to go, what's the harm in giving it a couple months to find out what the law's going to be? Save our schools from Title IX violations and, and all the stuff that, um, that comes along with it. And so, I, that's the legal ground. All right. But more than that, I want to talk about the human ground.

Um, I don't know if you know a lot of transgender youth. Um, there's a lot of misconception, there's a lot of myths, there's a lot of stories about what kind of people they are. Um, they get sometimes per- put on these labels as some kind. They're, they're trying to sneak into bathrooms or get unfair competitive advantages and kind of demonized. And we do that a lot. I submit that if you will spend some time talking to some and you p- I promise you, you have them in your district, you'll find that they're like every other kid. And maybe a little worse in the sense that they face things that none of us maybe understand.

They're not trying to get over on anything. They're trying to stay alive today. They're trying to make it through the day, uh, in a, in a world that frankly is, is a little more cruel maybe than it should be. So for me, if I have a child and, and I know several in my, in my district, that the one thing that they have that makes them feel like a part of something, like a human being with dignity and respect, is being on that team, or, or running in that practice, I'm not going to take it away from them and, and, and put them back into this, this, this category or subject them to a, what my friend talked, the, the external genitalia inspection. I'm just not going to do that. I don't think it's right. I don't think it's what we need to do for kids.

We've made it a long time being able to figure out how to play sports together and how to use bathrooms and all that. We don't need a law to tell us. Uh, but if you think we need a law, you'll have one here in, in a couple of months. So for those reasons Mr. Chairman, I, I can't support this bill and I hope that, that my friends will join me in opposition.

Chairman Capito: [35:25](#)

Further discussion. Gentleman from the 50th.

Del Garcia: [35:34](#)

Thank you Mr. Chairman. I'm speaking in opposition of this bill. As somebody who's represented female, uh, women who've been sexually assaulted in prisons, I didn't come to Charleston to force unwanted invasive sexual assaults of young girls, young boys. That's what this bill does. That's what you're doing if you vote yes on this. That's what the language says. That a doctor, that, this isn't a health, this isn't an examination for the purpose of seeing whether somebody's in good health. This is somebody, a doctor looking at whether there's unaltered internal and external reproductive anatomy.

That is disgusting. This bill singles out a group of people who face a challenging world. And I also didn't come down to Charleston to push somebody over the cliff if they're getting to the point of, of thinking about whether this life is worth living. That is crap. We shouldn't be doing this. Every single human being is made in the image of God. Every single one, whether you understand it or not. Whether you agree with how somebody lives or not, that's what we're talking about here today. I cannot support this bill.

Chairman Capito: [37:42](#)

Further discussion. Chair recognizes Lady from the 4th.

Del. Zukoff: [37:47](#)

Thank you Mr. Chairman. I'm also going to re- I'm also going to not support this bill for several reasons, both of which are, have already been mentioned from my friend from the 17th and the 50th. But I'm going to actually come at this from the aspect of a mother and my two daughters. And I raise my children to respect people as they are, not as some preconceived notion of what society thinks they should be. Or to ever put myself in a position that I could understand internally someone's mind, how they were made in the womb, how they came out feeling, how they felt about, you know, um, that they felt that they were always a boy.

I recently, and you all can look this up, there's a gentleman this week who just pre- he, he testified in the Missouri State Capital this week on a transgender bill similar. Has a, has a, um, child that was born as a boy, always identified as a male. And they, he and his, her mother made him dress as a boy, keep his haircut as a boy, um, had issues. And he had major issues. Was sad all the time, um, asked to dress in his sister's clothes and one day she was outside playing in the front yard with her brother and he called out to them to come to dinner. And she said, "No, it's time. I want to go across the street and play. Daddy, if I come in and change my clothes, can I go?"

And he realized what he was doing to that child by trying to make them something that they were not. And from a mother's perspective, I happened to be the mother of two very good

athletes. They're adults now. One of my daughters was a two time all-state softball pitcher and a two time all-state basketball guard when she was in high school. My other daughter was a swimmer and qualified every year for the state meets and she swam in college.

So, I can tell you my personal life for 20 years was running with those girls year-round, every sport they were in. They're, some of their best friends to this day as adults are the people that they participated in sports with. It helped them create lifelong friendships. They learned about leadership. They learned about how to get along with other people. All of the aspects that we find that sports, that we all love about sports.

And I think by taking these, taking, asking these children not to participate in the one thing that may bring them joy is just simply wrong. It's wrong for us to make that decision. This decision's going to be made for us very quickly. I think we have better things to do with our time in the West Virginia legislature than put this type of legislation forth. Thank you.

Chairman Capito: [40:33](#)

Is there further discussion? Chair recognizes the Gentleman from the 13th.

Del. Pinson: [40:39](#)

Thank you, Mr. Chair. I'll speak in favor of the bill that's in front of us today. Um, I don't think that maybe some of the dialog that, that has taken place over the last several minutes, several days, several weeks surrounding this topic is meant to be what it, what it has become. Uh, the bill that's in front of us today, uh, does not mean that individuals of this committee or of this body do not respect someone, do not have dignity for someone, despite whatever their gender might be.

The bill that's in front of us today is trying to place guardrails on the very sports that, that we're talking about, and the participation of those sports. Uh, we have spoke some today about the requests for a birth certificate in order for individuals to be able to participate in these sports. It's not been uncommon for us to request birth certificates for education and sports in the past for age-specific reasons. Just in a quick Google search, one can find that, uh, there is such a thing as age subjectivity where someone perceives themselves to be much younger or much older than they actually are.

And we would agree or at least hope we would agree that guardrails would need to be in place if someone, let's say my age, would want to participate in sports based on a different age. So, what, what we're doing here, and I hope that it's not lost in the dialog, but what we're doing here is talking about placing guardrails on these sports. It's not meant to be demeaning or

disrespectful. In fact, I would argue that for the individuals who are participating in their sports based on their natural-born gender, uh, I would argue that to them, it would seem that, that we are being very respectful to their natural-born gender. Thank you, Mr. Chair.

Chairman Capito: [43:19](#)

Chair recognizes the Gentleman from, the Gentleman from the 37th.

Del. Pushkin: [43:23](#)

Thank you Chairman Capito. Um, as one who has age subjectivity, I think I'm a lot younger than I actually am by the way, but, um, I apologize. You know, we're here at this late hour, uh, debating a bill that I complete, I feel is completely unnecessary. One of the, you know, my friend from the 13th's talking about guardrails. I'll tell you that most roads don't have guardrails because there's not a danger there. You put guardrails up where there's an actual, real danger of someone going off the side of the road but we don't have a single case of it. We are truly creating, looking for a solution in search of a problem and the solution itself is more problematic than the perceived problem.

We heard through testimony, this is one of the most alienated groups you can think of. Teens who are struggling with their own identity at the . . . All teens are struggling with their own identity. But especially, transgender teens who are, are incredibly alienated and struggling, we're going to, their legislature is, is up, here at 4:00 on a Friday, uh, deliberating this bill that's aimed directly at them for no apparent reason 'cause we don't even have any cases of it here.

So I would not, I mean I, I definitely wouldn't assign motives. I don't know what everybody's motives are. I'm sure there are some folks who really think this is a problem. I would beg of you to do some research and see and you'll find out it hasn't been a problem. And I think that there's a lot of us here who are wondering how they're going to vote. And they don't, they know it's not really a problem but they're still kind of not sure how they're going to come down on this vote. And I would just pray that you can muster up half the courage that these kids have who we're alienating with this bill. If you could muster up half the courage they have and vote this, this bill down 'cause it's completely unnecessary.

Chairman Capito: [45:15](#)

Is there further discussion on a motion? Is there further discussion? If not, the question before the committee is on the Gentleman from the 32nd's motion to report out the committee substitute for House Bill 3293 to the full house for the recommendation of the committee substitute do pass. All in favor, please signify by saying aye.

Audience: [45:31](#) Aye.

Chairman Capito: [45:32](#) All those opposed, please signify by saying no.

Audience: [45:34](#) No.

Chairman Capito: [45:36](#) Aye's appear to have it.

Audience: [45:38](#) Division.

Chairman Capito: [45:39](#) Division's been called. Please raise one hand if you are in favor. One hand if you are opposed. On the question of adoption, there are 16 yes's and five no's. The motion is adopted and the committee substitute for House Bill 3293 will be reported into the floor with a recommendation that it do pass. There are two subcommittees, uh, that are out there. Actually, there's three subcommittees that are out there. Um, and I believe some of those intend to perhaps meet next week. So, uh, listen for those announcements on the floor. Is there any further business to come before the committee? If not, everybody have a nice weekend. Gentleman from the 32nd.

Del. Haynes: [46:33](#) 9:30

Chairman Capito: [46:36](#) 9:30.

Del. Haynes: [46:37](#) And Mr. Chairman, I move we adjourn.

Chairman Capito: [46:40](#) All those in favor please signify by saying aye.

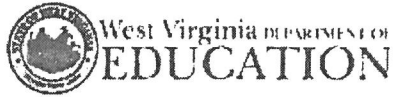
Audience: [46:43](#) Aye.

Chairman Capito: [46:43](#) All oppose, no. Aye's appear to have it.

Exhibit 37

Sarah Stewart

Government Affairs Counsel
Superintendent's Office



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Sent: Monday, March 15, 2021 9:44 AM
To: Sarah Stewart <sarah.a.stewart@k12.wv.us>
Subject: FW: Transgender participation in secondary schools bill

[EXTERNAL SENDER]: Do not click links, open attachments or reply to this email unless you recognize the sender and know the content is safe.

Sarah,

Per our discussion.

Thank you,
Melissa

Melissa J. White
Chief Counsel
Committee on Education
West Virginia House of Delegates
Room 432M
1900 Kanawha Boulevard, East
Charleston, WV 25305

From: Melissa White
Sent: Thursday, March 11, 2021 9:53 AM
To: Bernie Dolan <bernie.dolan@wvssac.org>; Bernie Dolan <bdolan@k12.wv.us>
Subject: Transgender participation in secondary schools bill

Bernie,

Attached is a draft of an originating bill regarding transgender participation in sports. I kept it short: There are obviously certain things that would need to be handled in a rule, unless you have language that you would like to see in the bill. Please let me know your thoughts and if there are any unintended consequences. The Chairman does not want to keep girls from participating in boys sports when there are not girls teams.

Thanks,
Melissa

Melissa J. White
Chief Counsel
Committee on Education
West Virginia House of Delegates
Room 432M
1900 Kanawha Boulevard, East
Charleston, WV 25305

Exhibit 38

Sarah,

Per our discussion.

Thank you,
Melissa

Melissa J. White
Chief Counsel
Committee on Education
West Virginia House of Delegates
Room 432M
1900 Kanawha Boulevard, East
Charleston, WV 25305

From: Melissa White
Sent: Thursday, March 11, 2021 9:53 AM
To: Bernie Dolan <bernie.dolan@wvssac.org>; Bernie Dolan <bdolan@k12.wv.us>
Subject: Transgender participation in secondary schools bill

Bernie,

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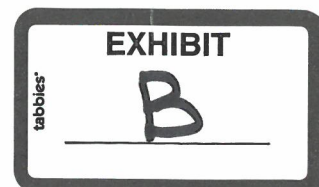
Thanks,
Melissa

Melissa J. White
Chief Counsel
Committee on Education
West Virginia House of Delegates
Room 432M
1900 Kanawha Boulevard, East
Charleston, WV 25305



2021 Green Book

*Summary of Public Education
Bills Enacted During the 2021
Regular Session*





**West Virginia Board of Education
2021-2022**

Miller L. Hall, President
Thomas W. Campbell, CPA, Vice President
F. Scott Rotruck, Financial Officer

Robert W. Dunlevy, Member
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Debra K. Sullivan, Member
Nancy J. White, Member
James S. Wilson, D.D.S., Member

Sarah Armstrong Tucker, Ph.D., Ex Officio
Chancellor
West Virginia Higher Education Policy Commission
West Virginia Council for Community and Technical College Education

W. Clayton Burch, Ex Officio
State Superintendent of Schools
West Virginia Department of Education

CODE CHANGES

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§11-3-15c	HB 2581	§18-5-45a	SB 11	§18-9B-11a	HB 3177	§18-31-7	HB 2013
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§11-3-24	HB 2581	§18-5G-9	HB 2012	§18-9B-18	HB 3177	§18-31-13	HB 2013
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§11-3-24b	HB 2581	§18-5G-11	HB 2012	§18-9B-20	HB 3177	§18A-2-25	HB 3293
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§11-3-25a	HB 2581	§18-5G-14	HB 2012	§18-9D-15	HB 2906	§18A-3-2a	SB 14
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§17B-2-7	SB 356	§18-9A-8a	HB 3177	§18-30A-9	HB 2001	§21-6-5	SB 435
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§18-4-12	HB 3177	§18-9B-6a	HB 3177	§18-31-3	HB 2013	§55-19-8	SB 277
§18-5-15g	HB 2791	§18-9B-7	HB 3177			§55-19-9	SB 277

Legend for this page:

- **Black** designates amended code.
- **Red** designates stricken code.
- **Green** designates new code.

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Amends: §18-9A-6a; §18-9A-7; §18-9A-16; §18-9B-1; §18-9B-2; §18-9B-3; §18-9B-4; §18-9B-5; §18-9B-6; §18-9B-6a; §18-9B-7; §18-9B-8; §18-9B-9; §18-9B-10; §18-9B-12; §18-9B-13; §18-9B-14; §18-9B-15; §18-9B-17; §18-9B-18; §18-9B-19; §18-9B-20; §18-9B-21

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Senate Bill 11: Declaring work stoppage or strike by public employees to be unlawful

Effective Date: June 2, 2021

Code Reference: Adds: §18-5-45a

WVDE Contact: Heather Hutchens, General Counsel, Office of Legal Services

Bill Summary: The bill confirms that a work stoppage or strike by public employees, and specifically employees of a county board of education, is both unlawful and disruptive to the delivery of the constitutionally required thorough and efficient education. The bill outlines when an employee is participating in a concerted work stoppage, strike, or interruption of operations. This bill clarifies that an employee may not take personal leave to participate in a work stoppage/strike and clarifies that a county board may not utilize accrued or equivalent instruction time or alternate delivery models to cancel or make up lost days. The bill clarifies that the West Virginia Board of Education (WVBE) waiver process cannot be utilized to waive the employment term or minimum instructional term if the noncompliance is because of a work stoppage or strike. This bill clarifies participation is a ground for termination, but if the county does not terminate the employee, the employee's salary should be prorated to account for the absence.

Senate Bill 14: Providing for additional options for alternative certification for teachers

Effective Date: May 27, 2021

Code Reference: Amends: §18A-3-2a

WVDE Contact: Carla Warren, Director, Educator Development and Support

Bill Summary: The bill proposes an alternative certification pathway for individuals to obtain a professional teaching certificate. The bill sets forth four requirements that an individual must obtain to be eligible to receive a professional teaching certificate: (1) hold a bachelor's degree; (2) submit to a criminal history check; (3) successfully complete pedagogical training or pedagogical course(s) that are in substantive alignment with nationally recognized pedagogical standards, or approved/established by the state board; and (4) pass the same subject matter and competency tests required of traditional program applicants for licensure.

Senate Bill 89: Exempting certain kindergarten and preschool programs offered by private schools from registration requirements.

Effective Date: July 4, 2021

Code Reference: Amends: §49-2-113

WVDE Contact: Monica DellaMea, Director, Early and Elementary Learning Services

Bill Summary: The passage of this bill no longer requires certain early childhood programs to obtain approval of its operations from the secretary of the West Virginia Department of Health and Human Resources through the child care licensure process. This includes kindergarten, preschool, or school education programs operated by a public school or which is accredited by the West Virginia Department of Education or any other kindergarten, preschool, or school programs which operates with sessions not exceeding four hours per day for any child pre-k and kindergarten programs. Any kindergarten, preschool, or school education program operated by a private, parochial, or church school recognized by the West Virginia Department of Education under Policy 2330 are also not required to obtain approval of its operations.

Senate Bill 277: Creating COVID-19 Jobs Protection Act

Effective Date: March 11, 2021

Code Reference: Adds: §55-19-1; §55-19-2; §55-19-3; §55-19-4; §55-19-5; §55-19-6; §55-19-7; §55-19-8; §55-19-9

WVDE Contact: Legal Services

Bill Summary: The bill provides immunity to county boards of education, among other, to claims arising from the COVID-19 pandemic, provided the county board (or any of its employees or agents) did not intentionally engage in conduct with actual malice to cause injury.

Senate Bill 356: Allowing for written part of drivers' exam given in high school drivers' education course.

Effective Date: June 24, 2021

Code Reference: Amends: §17B-2-7

WVDE Contact: Joey Wiseman, Director, Middle and Secondary Learning Services

Bill Summary: The bill allows for West Virginia Driver Education Instructors to administer a knowledge test developed by the Division of Motor Vehicles. Any person who successfully completes a test administered by a driver education instructor is exempt from the proof of school enrollment requirements.

Senate Bill 375: Relating to county boards of education policies for open enrollment.

Effective Date: July 6, 2021

Code Reference: Amends: §18-5-16

WVDE Contact: Legal Services

Bill Summary: The bill makes a few changes to the modifications that were made in the 2019 education omnibus bill relating to intercounty transfers (where a student seeks to attend school in a county other than the one where he or she resides) and reinserts funding language that was inadvertently omitted in the 2019 bill. Substantively, the bill says that an intercounty transfer application may only be denied by a county board of education if there is no classroom space available. If an intercounty transfer request is denied, the denial must be in writing and sent to both the parents of the student and the West Virginia Department of Education (WVDE), with explanation of denial and notification of appeal rights, within three business days.

Senate Bill 431: Relating to school attendance notification requirements to DMV.

Effective Date: June 24, 2021

Code Reference: Amends: §18-8-11

WVDE Contact: Charlene Coburn, Officer, Support and Accountability Services

Bill Summary: The bill authorizes DMV to accept electronic verification of a student's attendance and satisfactory academic progress from a county board of education. Verification of these two items is statutorily required prior to issuance of a driver's license or learner's permit.

Senate Bill 435: Requiring county superintendents to authorize certain school principals or administrators at nonpublic schools to issue work permits for enrolled students.

Effective Date: June 24, 2021

Code Reference: Amends: §21-6-3; §21-6-4; §21-6-5; §21-6-10

WVDE Contact: Legal Services

Bill Summary: The bill permits individuals that are authorized to issue graduation credentials (nonpublic school administrators and homeschool parents) to issue a work permit to children 14 or 15 years of age provided the current statutory requirements for issuing a work permit are satisfied (i.e., written statement from prospective employer that they intend to employ the child; brief description of job child will perform; review of birth certificate verifying child's age; for children attending a nonpublic schools, a certificate showing school attendance). The bill imposes the same responsibilities and penalties for improper issuance of a work permit on nonpublic school administrators and home school parents that are currently imposed upon county superintendents issuing work permits.

Senate Bill 636: Requiring certain history and civics courses be taught in schools.

Effective Date: July 9, 2021

Code Reference: Amends: §18-2-9

WVDE Contact: Sonya White, Officer, Office of Teaching and Learning
Joey Wiseman, Director, Middle and Secondary Learning Services, Office of Teaching and Learning

Bill Summary: The bill adds the following topics/areas that must be taught in all public, private, parochial, and denominational schools in West Virginia:

- Institutions and structure of American government, such as the separation of powers, the Electoral College, and federalism.
- American political philosophy and history utilizing writings from prominent figures in Western civilization, such as Aristotle, Thomas Hobbes, John Locke, and Thomas Jefferson.
- Objective and critical analysis of ideologies throughout history, including capitalism, republicanism, democracy, socialism, communism, and fascism.

In providing this instruction, the bill directs that teachers use primary sources and interactive learning techniques, such as mock scenarios, debates, and open and impartial discussions.

The WVBE is directed to develop academic standards for middle and high school students that cover the required instruction and publish a list of approved instructional resources pursuant to 18-2A-1, et seq. The WVBE is required to consult with “other entities” prior to adopting standards; the bill lists the following entities as possible entities to consult: Florida Joint Center for Citizenship, College Board, Bill of Rights Institute, Hillsdale College, Gilder Lehrman Institute of American History, Constitutional Sources Projects, educators, school administrators, postsecondary education representatives, elected officials, business and industry leaders, parents, and the public.

The WVBE is also required to provide a testing/assessment for the history and civics courses required. Such assessments must measure a students’ factual and conceptual knowledge including how facts interrelate and the reasons behind historical documents and events. All students in public, private, parochial, and denominational schools are required to take these assessments.

Senate Bill 651: Allowing county boards of education to publish financial statements on website.

Effective Date: July 6, 2021

Code Reference: Amends: §18-9-3a

WVDE Contact: Amy Willard, School Operations Officer, Office of School Operations and Finance

Bill Summary: Starting with financial statements to be published in the fall of 2024, the bill extends the time for county boards of education (CBOE) to annually publish their financial statement in the newspaper from 90 days to 120 days.

Also starting in 2024, the bill provides an electronic option in place of posting the financial statement in the newspaper if certain conditions were met. After conducting a properly noticed public hearing at which interested persons could express their views electronic publication, a CBOE could post its financial statement on the CBOE’s website. The first year the CBOE utilizes the electronic option it is required to publish in the newspaper for two consecutive weeks the availability of the financial statement on the CBOE’s website.

In addition to all financial information currently required to be included in the CBOE's financial statement, if the CBOE utilizes the electronic option to post financial statement it must also include the following information: (1) all persons having a contract with the county board (all professional and service personnel, including substitutes) and the amount paid to each; (2) budget estimates; and (3) list of names of each entity receiving less than \$250 from any fund showing the amount paid and purpose for which it was paid. Financial statements posted on the CBOE website must remain posted until the posting of the following year's financial statement.

Senate Bill 680: Allowing State Superintendent of Schools define classroom teachers certified in special education.

Effective Date: July 5, 2021

Code Reference: Amends: §18A-4-2

WVDE Contact: Amy Willard, School Operations Officer, Office of School Operations and Finance

Bill Summary: This is a 'clean-up' bill to a provision included in HB206 (passed in 2019) that provides a three step pay bump to special education classroom teachers.

House Bill 2001: Relating generally to creating the West Virginia Jumpstart Savings Program

Effective Date: June 9, 2021

Code Reference: Adds: §11-21-12m; §11-21-25; §11-24-10a; §18-30A-1; §18-30A-2; §18-30A-3; §18-30A-4; §18-30A-5; §18-30A-6; §18-30A-7; §18-30A-8; §18-30A-9; §18-30A-10; §18-30A-11; §18-30A-12; §18-30A-13; §18-30A-14; §18-30A-15; §18-30A-16

WVDE Contact: Amy Willard, School Operations Officer, Office of School Operations & Finance
Phillip Uy, Financial Officer

Bill Summary: The bill establishes the West Virginia Jumpstart Savings Program as a result of the Legislature recognizing the importance of cultivating an environment in West Virginia where tradespersons and entrepreneurs can be successful in their careers and remain in their home state. The program is to be operable on or before July 1, 2022.

- The bill indicates that the program shall be administered by the West Virginia Jumpstart Savings Board (Board) and outlines the seven members who serve on the Board. The bill outlines the powers and

- authority of the Board to successfully administer the program.
- The bill also outlines the duties and responsibilities of the Treasurer, who is also the chairman and presiding officer of the Board.
- The bill further establishes the Jumpstart Savings Trust Fund and Jumpstart Savings Expense Fund for the administration of the program and outlines the process for selecting financial organizations to act as depositories and managers for the programs.
- The bill defines the eligibility criteria for opening a Jumpstart Savings Account and for when the Treasurer will deposit \$100 into a newly opened account.
- The bill defines qualifying expenses, which include:
 - » The purchase of tools, equipment, or supplies by the beneficiary to be used exclusively in an occupation or professional for which the beneficiary is required to:
 - » Complete an apprenticeship program through the United States Department of Labor
- Complete an apprenticeship program required by state or legislative rule
- Earn a license or certification from an Advanced Career Education (ACE) career center; or
- Earn an associate degree or certification from a community and technical college.
 - » Fees for required certification or licensure for the beneficiary to practice a trade or occupation in the state as described above.
 - » Costs incurred by the beneficiary that are necessary to establish a business in this state in which the beneficiary will practice an occupation or profession as described above, when the costs are exclusively incurred and paid for the purpose of establishing and operating such business.
- The bill provides for certain tax benefits for contributors to a Jumpstart Savings Account. For West Virginia personal income tax purposes, a taxpayer's adjusted gross income is reduced by an amount equal to the taxpayer's contribution to a Jumpstart Savings Account, up to \$25,000 in a single taxable year, with a carryforward provision not to exceed five taxable years. A similar modification is allowed in an amount equal to a distribution received from a Jumpstart Savings Accounts that is used to pay for qualified expenses, not to exceed \$25,000 for the taxable year.
- The bill provides for certain nonrefundable tax credits against West Virginia personal income tax and corporate net income tax for a

matching contribution made by a qualified employer into a Jumpstart Savings Account if the beneficiary of the account is an employee of the taxpaying employer and if the beneficiary is a West Virginia resident. The tax credit allowed may not exceed \$5,000 per employee per taxable year and an employer may not claim a credit against more than one type of tax for a single contribution to a Jumpstart Savings Account.

- The bill requires the Board to promulgate legislative, procedural, or emergency rules that outline specific requirements related to the program.

House Bill 2009: Relating to limitations on the use of wages and agency shop fees by employers and labor organizations for political activities.

Effective Date: June 17, 2021

Code Reference: Add: §7-5-25
Amends: §8-5-12; §12-3-13b; §18A-4-9; §21-5-1; §21-5-3; §45A-2-116

WVDE Contact: Legal Services

Bill Summary: Relating to limitations on the use of wages and agency shop fees by employers and labor organizations for political activities. House Bill 2009 prohibits the deduction or assignment of union, labor organization or club dues or fees from the earnings of county board of education employees. As for wage assignments for permissible purposes, the bill also removes the requirement that assignments of an employee's future wages must be notarized. It will now be sufficient if the assignment is in writing.

House Bill 2012: Relating to Public Charter Schools

Effective Date: June 1, 2021

Code Reference: Amends: §18-5G-1; §18-5G-2; §18-5G-4; §18-5G-5; §18-5G-6; §18-5G-9; §18-5G-10; §18-5G-11
Adds: §18-5G-13; §18-5G-14; §18-5G-15

WVDE Contact: Legal Services

Bill Summary: The bill makes the following changes to the existing public charter school law:

- Increases the cap on charter schools from 3 to 10 every three years.