EXHIBIT 59

IN THE UNITED STATE DISTRICT COURT
FOR THE MIDDLE DISTRICT OF ALABAMA
NORTHERN DIVISION

BRIANNA BOE, et al, Plaintiffs, UNITED STATES OF AMERICA, Intervenor Plaintiff -verus- HON. STEVE MARSHALL, in his official capacity as Attorney General of the State of Alabama, et al, Defendants	CIVIL ACTION NO. 2:22-CV-184-LCB

Deposition of DR. MEREDITHE McNAMARA, taken pursuant to Rule 30(b) of the Federal Rules of Civil Procedure, held at SANDERS, GALE & RUSSELL COURT REPORTING, 555 Long Wharf Drive, First Floor, New Haven, Connecticut, before Julia Flynn Cashman, RPR, CSR 250 and Notary Public in and for the State of Connecticut, on Thursday, April 4, 2024, at 9:00 a.m.(Eastern)

APPEARANCES:

ATTORNEYS FOR PLAINTIFFS:
GLBTQ LEGAL ADVOCATES & DEFENDERS
18 Tremont Street, Suite 950
Boston, Massachusetts 02108
BY: JENNIFER L. LEVI, ESQUIRE
JLevi@glad.org
-with-
HUMAN RIGHTS CAMPAIGN
1640 Rhode Island Ave. NW
Washington, DC 20036
BY: CYNTHIA CHENG-WUN WEAVER, ESQUIRE
Senior Director of Litigation
Cynthia.weaver@hrc.org

ATTORNEY FOR INTERVENOR PLAINTIFF:

US DEPARTMENT OF JUSTICE
CIVIL RIGHTS DIVISION
BY: COTY MONTAG, ESQUIRE
US Deputy Chief
Coty.montag@usdoj.gov

ATTORNEYS FOR DEFENDANT:

ALLIANCE DEFENDING FREEDOM
15100 N. 90th Street
Scottsdale, Arizona 85260
BY: ROGER G. BROOKS, ESQUIRE
Rbrooks@adflegal.org
SUZANNE BEECHER, ESQUIRE

STIPULATIONS

IT IS HEREBY STIPULATED AND AGREED by and between counsel for the respective parties hereto that all technicalities as to proof of the official character before whom the deposition is to be taken are waived.
IT IS FURTHER STIPULATED AND AGREED by and between counsel for the respective parties hereto that the reading and signing of the deposition by the deponent are waived.
IT IS FURTHER STIPULATED AND AGREED by and between counsel for the respective parties hereto that all objections, except as to form, are reserved to the time of trial.

* * * * *

DR. MEREDITHE McNAMARA,
15 York Street, New Haven, Connecticut 06511,
having been first duly sworn by Julia Flynn Cashman, a Notary Public in and for the State of Connecticut, testified on her oath as follows:
MR. BROOKS: I'd ask the reporter to mark as McNamara Exhibit 1, the Curriculum Vitae of Meredith McNamara.
(DEFENDANT'S EXHIBIT 1 FOR IDENTIFICATION Received and Marked.)
DIRECT EXAMINATION
BY MR. BROOKS:
Q. Dr. McNamara, good morning.
A. Good morning.
Q. My name is Roger Brooks. I represent the defendants in this action. The Curriculum Vitae that I have marked as Exhibit 1 was attached to your Expert Report.
Let me just ask you to take a look at this and see whether you believe it to be -- it's dated January '23. Are there any important changes to your responsibilities or publications as listed on this Curriculum Vitae?
A. I have submitted a newer CV with my Rebuttal Report. This one is a little over a year old.

Q. And does that new one contain any important changes in your professional responsibilities?
A. Not in my professional responsibilities.
Q. Let me ask a few questions to kind of get a scope of the boundaries of your expertise.
I see at the bottom of the page, it's marked 28, that you have board certification in General Pediatrics and Adolescent Medicine. Do you have any other board certifications?
A. No, sir.
Q. Am I correct that you do not consider yourself a mental health professional?
A. That's correct, I do not.
Q. You're not a psychiatrist?
A. No, sir.
Q. You're not an expert in psychology?
A. No, sir.
Q. You have no expertise in adolescent development psychology?
A. No, sir.
Q. You're not an expert in cognition or the study of cognitive development?
A. No, sir.
Q. You're not a neurologist?
A. No.

Page 6

Q. Do you consider yourself an expert in the diagnosis and treatment of intersex conditions or disorders of sexual development?
A. No, I do not.
Q. Your peers don't consult you on that topic?
A. No, they have not.
Q. Do you consider yourself an expert in medical ethics beyond that which any medical doctor needs to know?
A. No, I do not.
Q. Do you have any publications in the field of medical ethics?
A. Not as of now.
Q. Have you submitted something that, in that field, that you hope to get published?
A. Yes, I have.
Q. And tell me what that is.
A. I submitted a paper on the Ethics of Bans on Gender Affirming Care.
Q. To what journal?
A. To a journal called the Journal of Pediatrics, a medical ethics special edition. It's under consideration.
Q. And have you ever taught a course in medical ethics?

Page 7

A. No, sir.
Q. Have you, yourself, ever participated in the conduct of any clinical trial on any topic?
A. No, sir.
Q. Certainly nothing relating -- no clinical trial related to gender dysphoria?
A. No.
Q. Are you a member of WPATH?
A. No.
Q. Have you ever attended any WPATH meetings?
A. Yes.
Q. Is there a reason that you're not a member of WPATH?
A. Yes, their membership is expensive and I have limited educational funds.
Q. Do you know whether you satisfy the professional qualifications for membership?
A. I'm unaware of what those professional qualifications may be.
Q. Have you had any role in the development of either WPATH's standard of care or SOC 7 or SOC 8?
A. No, I have not.
Q. Were you invited to review or comment on any draft materials of either of those standards of care?

Page 8

A. I was not.
Q. Now, you're not an endocrinologist either; am I correct?
A. I am not an endocrinologist.
Q. You are not a member of the Endocrine Society?
A. I'm not a member of the Endocrine Society.
Q. And had no participation in the development of the 2009 Endocrine Society Guidelines For Treatment of Gender Dysphoria, nor in the 2017 update of those guidelines; am I correct?
A. I haven't participated in either guideline development process.
Q. And you don't know with regard to either WPATH or the Endocrine Society, how the members of the committees that did that drafting were selected, do you?
A. I do not.
Q. Nor what their qualifications might have been?
A. I don't know about that.
Q. Do you consider yourself an expert in clinical experimental methodology?
A. I'm unsure of what you mean by "clinical experimental methodology."

Page 9

Q. Have you ever published any peer-reviewed article relating to experimental methodology?
A. Again, I'm unsure of what you mean by "experimental methodology."
Q. Do you consider yourself an expert in the field of evidence-based medicine?
A. Yes, I do.
Q. Have you ever taught a course in evidence-based medicine?
A. No, I have not.
Q. Have you ever taken a course in evidence-based medicine?
A. Yes, I have taken several.
Q. And where did you take those courses?
A. I obtained a Master's in Clinical Research, a MSCR degree, at Emory University in 2013. It was two years of training in clinical research and the courses included in that program were biostatistics, epidemiology, study design, research bioethics, statistical programming, grant writing, among others. And I completed a mentored senior thesis project, which I published in that two-year span.
Q. Have you ever studied any texts on evidence-based medicine authored in whole or in

Page 10

part by Gordon Guyatt?
A. I have familiarized myself with Dr. Guyatt's work. I have not read a book of his cover to cover. I have read many of his peer-reviewed articles.
Q. And were those articles that you read in the course of the education that you've described just now?
A. No, those articles and his body of work was not covered in my evidence-based medicine training.
Q. Do you have any understanding of Dr. Guyatt's reputation in the field of evidence-based medicine?
A. I'm loosely familiar with him as a founding member of the grade working group.
Q. And what is the, quote, great working group?
A. It is a cohort of --
Q. Pardon me, I may have misunderstood you. Did you say "great" or "grade"?
A. I said "grade."
Q. G-R-A-D-E.
A. Correct.
Q. Pardon me. For the record, now let me ask you the right question. What is the grade working

Page 11

group?
A. It is a cohort of statisticians and clinicians with research experience who have developed a methodology for assessing clinical evidence and devising recommendations utilizing guidelines of care.
Q. Have you, at any point in your professional work, made a special study of suicide or suicidality?
A. Could you be a little more specific with the meaning -- with what you mean by "special study"?
Q. Is that an area that you have made a focus of professional research?
A. Professional research is what you mean by "special study"?
Q. Yes.
A. No, I have not.
Q. Let me ask you to turn to 32 in your CV.
And here, if I have missed something by using the older version, you can tell me. I'm looking at, on page 32 of Exhibit 1, the heading that says "Peer-Reviewed Original Research." Do you see that?
A. Yes, I do.
Q. And there are three items listed there. Has

Page 12

anything been added to that list since the beginning of 2023?
A. Yes.
Q. And what is that?
A. It was an article published in Pediatrics sometime in July, I believe, on my working groups process for developing and disseminating reports on scientific mis- and disinformation, and policy discussions pertaining to bans on gender affirming care.
Q. Now, was that paper a paper that reported on original clinical research?
A. It was not clinical research.
Q. When I see the three items listed here, I see a case -- a single case report. Am I correct that a case report reports on a single patient, rather than on a study across multiple patients?
A. Under the section entitled Peer-Reviewed Original Research, I do not see a case report.
Q. I'm sorry. I was --
A. There's a peer-reviewed case report at the very bottom of this page.
Q. Yes. And that's -- sorry, I was focusing on the "peer-reviewed." Am I correct that the case report deals with a single patient?

Page 13

A. Correct.
Q. And that is a paper that has nothing to do with gender dysphoria issues or any issues relating to identity; correct?
A. No.
Q. Not correct?
A. Let me be a little clearer. This paper is about a genetic deletion in a patient who had epilepsy and brain malformations. This patient was a toddler and one that I cared for in residency. And I coauthored this with some colleagues and supervising attending in my residency program.
Q. And, again, that case report and that case had nothing do with gender identity, am I correct?
A. Correct, it had nothing do with gender identity.
Q. Okay. And when I look at the heading that says "Peer-Reviewed Original Research," the first item there is a paper that you coauthored with authors' last names Kempton and Antun, correct?
A. Yes, that's correct.
Q. And that, again, related to hemophilia and had nothing to do with gender identity; am I correct?

Page 14

A. That's correct.
Q. You have no peer-reviewed publications reporting original research by you on any topic relating to gender identity; am I right?
A. That is correct.
Q. We may come back to this, but you can set it aside.
MR. BROOKS: I'd like to mark as McNamara Exhibit 2, transcript of proceedings on August 10, 2023, in the Northern District of Georgia.
(DEFENDANT'S EXHIBIT 2 FOR IDENTIFICATION, Received and Marked.)
Q. And Dr. McNamara, let me ask you to turn in this transcript to page -- let me ask you first, am I correct that you testified in a hearing in Georgia in August of last year?
MS. LEVI: You have to take a look through it.
Q. What I believe I have provided here is the subset of the transcript of that day's hearing that includes all of your testimony. You will see yourself introduced on page 76 at line 14, --
MS. LEVI: Take your time.
Q. -- you're sworn in. And I will I -- I am

Page 15

not going to ask you whether the entire transcript is accurate. I'm going to ask you about a couple of specific portions.
Let me ask you to turn to page 104.
Let me ask you to turn to page 104.
A. Yes, I'm working my way there.
Q. Well, if need be, I'll ask you to just put the thing aside. I'm not going to take time for you to read the whole transcript.
A. Okay. Let me get to that page. Okay.
Q. At page 104, beginning at line 7, you testified -- and you can tell me if, in your recollection, anything about this transcript is not correct as I read it -- but you testified "I provide full spectrum care for adolescents and that includes youth who experience gender dysphoria."
Then counsel asked you, "Do you prescribe hormone therapy, puberty blockers, or hormones?"
And you responded, "I don't prescribe puberty blockers."
Let me ask you now, a few months later, does it remain true that in your professional practice, you yourself are never responsible for prescribing puberty blockers?

Page 16

A. I have prescribed puberty-blocking medications for people who do not have gender dysphoria for uses outside of that context.
Q. And was that in the context of precocious puberty?
A. No, that's not a condition I diagnose or manage.
Q. For what conditions have you prescribed puberty blockers?
A. For adolescent females with autoimmune conditions that require therapies that would be toxic to their ovaries, we will utilize puberty-blocking medications to stop cellular development temporarily in their ovaries and protect them while they receive those medications. That is something that I have done since this testimony.
Q. Okay. It remains true that you yourself have not had, professionally, prescribed puberty blockers as a therapy for gender dysphoria?
A. That's correct.
Q. In the next line here, line 14 and continuing, you testified, "I take care of patients up to about age 25. My position at Yale is a little unique. I'm kind of their generalized

Page 17

medicine person and we have a gender clinic." Do you see that testimony?
A. Yes.
Q. And am I correct that Yale has a gender clinic, but you are not a member of the staff of that gender clinic?
A. That's correct.
Q. And you don't hold and have never held an appointment as a member of any gender clinic; am I correct?
A. That's correct.
Q. The leading members of Yale's gender clinic include Drs. -- I may say these names incorrectly -- Boulware, Olezeski and Patel?
A. Those are some of them, correct.
Q. And do you consider them to be expert in the treatment of gender dysphoria?
A. Yes, I do.
Q. If a patient who you see as a pediatrician raises issues to you that suggest to you that they may suffer from gender dysphoria, do you yourself undertake to diagnose whether that patient does or does not suffer from gender dysphoria?
A. Generally, no, if that patient is a minor, I do not.

Page 18

Q. And in what context have you diagnosed gender dysphoria in adults?
A. I have diagnosed gender dysphoria in adults when they meet diagnostic criteria for gender dysphoria according to the most recent edition of the DSM.
Q. I'm just curious, given that your appointment seems to relate to Pediatrics, in what context do you find yourself treating or diagnosing and dealing with adults who may suffer from gender dysphoria?
A. So I'm an adolescent medicine physician and I'm board certified and able to care of patients up until the age of 25, with some flexibility there.
Q. And am I correct that you have never been a physician with primary responsibility for prescribing treatment for gender dysphoria in a minor?
A. That's correct.
Q. You testified in Georgia -- and I'll skip down to the bottom on page 104, that "I only have 20 minutes per appointment and I see a lot of other things. I see a lot of complex trauma, sexual reproduction health needs, sports medicine

Page 19

issues, other menstrual concerns, dermatology. I could go on and on, but it's just where my institution needs me is to provide general adolescent care."
Does that continue to accurately describe your responsibilities today?
A. I have been able to expand some of my appointment times to 40 minutes, which is nice and allows me to go in further depth with some of my patients about complex issues. But otherwise I would say that that characterizes the type of clinical care that I provide.
Q. You don't claim to be an expert in the specifics of administration of either puberty blockers or hormones, cross-sex hormones, to use to treat endocrine disorders or gender dysphoria, correct?
A. If you are describing minors, that is correct.
Q. What steps, if any, have you taken to familiarize yourself with the actual practices in the gender clinic at the University of Alabama Birmingham Gender Clinic?
A. I haven't taken any steps.
Q. Have you ever talked with Dr. Ladinsky to

Page 20

learn from her anything about her actual practices?
A. I have had two conversations with Dr. Ladinsky that were largely surface level and not pertinent to her practice.
Q. So you yourself don't have any knowledge and don't plan to offer any testimony as to what extent the University of Alabama Gender Clinic and Dr. Ladinsky have or have not followed WPATH standards of care in the course of their treatment of minors for gender dysphoria?
A. I cannot offer any testimony to that regard.
Q. You don't know anything about how long they require a patient, a minor patient, to undergo psychological evaluation before authorizing puberty blockers or cross-sex hormones?
A. That's not something I'm aware of.
Q. Have you reviewed their Informed Consent disclosures to form an opinion as to whether those are adequate?
A. I have not seen those forms.
Q. Have you ever been asked to review the Informed Consent disclosure forms of the Yale Pediatric Gender Clinic to form a view as to whether those were adequate disclosures?

Page 21

A. I have not reviewed those forms.
Q. When was the Yale Pediatric Gender Clinic founded?
A. I don't know.
Q. How many minors have you, in your practice, ever referred to that clinic?
A. Just give me a moment while I search my recollection.
Q. And I will say, approximately, roughly.
A. I believe two.
Q. And were both those minors who you referred to the clinic in fact ultimately diagnosed with gender dysphoria?
A. One has not yet been seen. That patient is still awaiting their appointment, I believe. And I am unfamiliar with the specific details of the patient who was assessed off the top of my head.
Q. Would you tell me -- of course, not names -- but ages and sexes of those two patients that you referred and when you made those referrals?
A. One was --
Q. And to be clear, I refer to natal sex particularly.
A. I understand that. Thank you for the clarification. I'm pausing just to gather my

Page 22

recollection.
Q. Mm-hmm.
A. One was 14 at the time of referral, assigned female sex at birth, received an assessment at the age of 15. And one was 15 at the time of referral and assigned female sex at birth.
Q. And that second one is the one who's waiting her first appointment?
A. Yes.
Q. The one natal female who you referred at age 14 who received an assessment, I think you said at age 15 -- am I remembering that correctly?
A. Yes.
Q. Do you know what medical treatments, if any, have now been prescribed to her by the clinic?
MS. LEVI: Object as to form.
A. That patient has not received any prescriptions since the time of their assessment.
Q. Do you know whether the Yale Pediatric Gender Clinic takes systematic steps to monitor the mental and physical health of patients who treat for gender dysphoria past the age of 18?
MS. LEVI: Object as to form.
A. I do know that they do.
Q. And what steps do you know that they take to

Page 23

monitor the mental and physical health of those patients past the age of 18?
A. They maintain continued relationships with their patients into adulthood. They transition their patients to other services on a highly individualized basis. And those patients meet with a multidisciplinary mental health team with whom they've been working for some time as adolescents.
Q. Do you have any knowledge as to what percentage of patients who are referred by any physician to the Yale pediatric gender clinic are ultimately prescribed gender affirming or cross-sex hormones by that clinic while they're minors?
MS. LEVI: Object as to form.
A. I don't know.
Q. And do you know what percentage of patients who are prescribed puberty blockers or hormonal medications as a treatment for gender dysphoria by the Yale Gender Clinic ultimately desist from pursuing a transgender identity and cease taking those medications?
MS. LEVI: Objection to form.
A. I have no awareness of that.

Page 24

Q. And do you know whether any minors who have been treated by the Yale Pediatric Gender Clinic with puberty blockers or cross-sex hormones have later been able to achieve healthy levels of fertility and have a healthy child?
MS. LEVI: Objection to form.
A. That's not something that I would have access to as a physician, apart from their services.
MR. BROOKS: Let me mark as McNamara Exhibit 3, a chapter from the DSM-V-TR manual headed "Gender Dysphoria."
(DEFENDANT'S EXHIBIT 3 FOR IDENTIFICATION Received and Marked.)
Q. And Dr. McNamara, I will represent to you that this is what I have described as the chapter from the DSM-V-TR edition. Is this a document that you are -- is this a chapter that you are familiar with?
A. Yes, I have seen this before.
Q. Let me ask you to turn to page 517 in Exhibit 3.
A. My page numbers are cut off.
Q. All right, it is a page -- I see that; I apologize. The text begins -- it's a ways in. At

Page 25

the very top of the page, begins in italics, "Late onset or pubertal/postpubertal onset gender dysphoria." Do you have that page?
A. Yes.
Q. I apologize for --
MS. LEVI: Can you give me one minute?
MR. BROOKS: Of course.
MS. LEVI: Okay, thank you.
I'm sorry, can you represent the actual page number, for the record?
MR. BROOKS: Yes, I can. And while I won't mark my highlighted copy, I'll show you 517 is the page number there.
MS. LEVI: Okay, thank you.
Q. The language that I read refers to "late onset or pubertal/postpubertal onset gender dysphoria." And it goes on to say that that can occur "even much later in life" than puberty.
Is adult onset gender dysphoria a mental health condition that you are familiar with professionally?
A. I'm not aware that there's a characterization with that specific terminology in the literature.
Q. Well, let me flip it around. Are you

familiar -- are you professionally familiar with the phenomena of gender dysphoria that first manifests itself after puberty?
A. After puberty has completed?
Q. Yes. I just read you language from the DSM-V that referred to gender dysphoria that may occur "even much later in life" than puberty. And my question is, has your professional work made you familiar with the phenomena described in DSM-V there?
A. My professional work has not -- let me say that differently. I have not encountered a patient who has been -- an adult who did not have gender dysphoria, and then developed gender dysphoria in my care.
Q. Okay. That has not been part of what you, yourself, have observed professionally?
A. That's correct.
Q. Do you have any opinion as to whether clinical observation of adults who, at least as far as reported, have developed gender dysphoria only after the completion of puberty, whether clinical observation of that population is relevant to medical decisions for the treatment of adolescents who experience gender dysphoria?

MS. LEVI: Objection to form.
A. I'm sorry, I don't understand your question.
MR. BROOKS: Let me ask the reporter to read it back.
(THE REPORTER READ THE RECORD)
MS. LEVI: Same objection.
A. I am sorry, her reading it back did not help me understand it better.
Q. All right. I'll return to that with specific articles from this.
At the end of the paragraph at the top of page 517 that I have directed you to is a sentence that reads "Parents of individuals with gender dysphoria of pubertal/postpubertal onset often report surprise, as they saw no signs of gender dysphoria during childhood."
In the two cases that you have referred to the pediatric gender clinic, both of those, am I correct, were cases that first presented in young people who were well into adolescence; correct?
A. At this time, I -- just give me a moment to try to remember.
Q. Let me break it apart. The first you mentioned was a girl who was 14, correct?
MS. LEVI: Objection to form.

Q. And am I correct that at age 14, she was well into adolescence?
A. I don't remember the exact age that that patient began puberty.
Q. And as you picture her in your mind, you have no recollection as to whether she was well into the process of adolescence?
MS. LEVI: Objection to form.
A. Where I am pausing is that the patient and parent presenting to my care was sometime after the patient began expressing a gender diversity. And I do not know off the top of my head at this time today if that disclosure and beginning of expressing that identity occurred before or after pubertal onset.
Q. In either of the two cases that you have referred on to the Yale Pediatric Gender Clinic, did the parents report surprise and tell you that they had not seen signs of gender dysphoria prior to puberty?
A. I don't recall either -- parental figures for either adolescent reporting any measure of surprise in my clinical encounters with them.
Q. And you referred to parental figures. In those two cases, were you interacting with

biological parents of the child?
MS. LEVI: And I just want to be clear, nothing that would disclose confidential information.
MR. BROOKS: Of course.
A. I use the term "parental figures" generally. Those were biological parents of both children.
Q. Do you consider it as a matter of science, known or at present not known, whether an adolescent onset gender dysphoria population exists which in fact experienced no gender dysphoric symptoms prior to puberty?
A. I am aware that there are adolescents who experience gender dysphoria at pubertal onset or after who did not report awareness of symptoms before puberty. I am also aware that there's a lot of heterogeneity in that.
MR. BROOKS: Let me ask the reporter to mark as Exhibit 4, the Expert Report of Meredithe McNamara.
(DEFENDANT'S EXHIBIT 4 FOR IDENTIFICATION Received and Marked.)
Q. And Dr. McNamara, does this indeed appear to be a copy of your original Expert Report?
A. Yes, that's what this is.

Page 30

Q. Let me ask you to turn to page 11 in that document. And there, there's a heading, "Defendants' Experts' Statements About Suicide." Do you see that?
A. Yes, I do.
Q. Part way into that paragraph, and then you discuss in the beginning of that paragraph, a study, a published paper, by authors, leading with -- there's so many names that I don't know how to pronounce -- Dhejne, D-H-E-J-N-E.
At the end of that, or late in that discussion, you say, "The Dhejne study has no applicability to adolescents."
Let me ask you to explain the basis of your opinion that the findings of the Dhejne study relating to suicide in adult years has no applicability to adolescents.
A. Just give me a moment, I'll refresh my memory by reading this paragraph.
Q. Of course.
A. This study evaluated a cohort of adults.
Q. And what is the basis for your conclusion that the incidence in suicide among the cohort of adults who had received cross-sex hormones had no applicability to adolescents?

Page 31

A. They are very different populations in several regards. The study did not gather data on adolescents specifically. It undertook no comparative analysis. One would have to perform several logical leaps in order to apply data in adults of older ages to minors.
Q. What leads you to conclude that for purposes of studying suicide and suicide attempts, that adolescents are different in important ways from adults?
A. Could you repeat that question.
MR. BROOKS: I'll ask the reporter to read it back.
(THE REPORTER READ THE RECORD)
A. Adolescents have very different social circumstances, different risks and experiences with mental health issues. But more so, my conclusion here is that a study that only reports on adults can only report on adults.
Q. Is it also your opinion that adolescents differ in important ways from prepubertal children?
A. That is the case, yes.
Q. And it is also your opinion, is it not, that barring catastrophe, all adolescents grow up to be

Page 32

adults?
MS. LEVI: Objection to form.
Q. This is an easy question, but it's not a trick question.
A. It's interesting sometimes when physicians and lawyers communicate. Adolescents do grow up to become adults, yes.
Q. Every single one who survives adolescence becomes an adult.
A. Yes.
Q. You would agree with me, would you not, therefore, that health outcomes among adults who have received and are receiving cross-sex hormones are something that you, as a physician, would want to take into account when advising an adolescent as to whether or not to start taking cross-sex hormones?
MS. LEVI: Objection to form.
A. With this particular study --
Q. I'm not asking you a question about this study.
MR. BROOKS: Let me ask the reporter to read back the question.
(THE REPORTER READ THE RECORD)
A. I would want to take into account any data

Page 33

that -- or any research with methodology and statistical design that was able to establish causal links between intervention and an outcome. And I regularly do so with some adult data in some ways.
This particular study does not lend itself to establishing a causative -- a causative -- excuse me, a causal relationship between gender-forming hormones and suicide, as the authors state, and as I quote in my Declaration.
Q. Dr. McNamara, is it your testimony that unless an outcome study is designed and structured so that it can establish a causal relationship, you, as a physician, do not wish to take into account the reported outcomes in providing medical advice?
A. That is not my testimony generally and across the board.
Q. But it's your testimony with regard to adult suicide statistics?
A. If I were to review evidence in a population that differed significantly from my population, I would probably have an extremely high standard for understanding causal relationships before I were to base clinical decisionmaking on that data.

Page 34

Q. Have you yourself made any study of differences that may or may not exist between adolescent gender dysphoria patients and adult gender dysphoria patients when it comes to suicide and suicidality?
A. I have seen studies that report on findings in both groups.
Q. And have you yourself made any efforts to understand to what extent there are important differences or not important differences between adolescents who suffer from gender dysphoria and adults who suffer from gender dysphoria when it comes to the experience of suicidality or actual completed suicide?
MS. LEVI: Objection to form.
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
MS. LEVI: Same objection.
A. I'm not sure that reading it back helps me understand the question better.
Q. Do you know, as you sit here today, whether rates of suicidality are significantly different among adolescents who are receiving cross-sex hormones and adults who are receiving cross-sex

Page 35

hormones in both case as treatment for gender dysphoria?
A. I'm -- off the top of my head, I cannot recall data that helps me make that comparison.
MR. BROOKS: Let me ask the reporter to mark as Exhibit 5, an article entitled "Long Term Follow-Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden," authored by Cecilia Dhejne and others.
(DEFENDANT'S EXHIBIT 5 FOR IDENTIFICATION Received and Marked.)
Q. Dr. McNamara, at the top, you will see that many, perhaps most of the authors, are associated with the Karolinska Institute in Stockholm, Sweden. Are you familiar with the reputation of that institute when it comes to the diagnosis and treatment of gender dysphoria?
A. I only know this institution by name.
Q. You don't know to what extent scientists associated with that institution have been responsible for important research in the area of treatment of gender dysphoria?
A. Not relative to anywhere else.
Q. Well, let me ask about anywhere else. Has any particular institution or institutions that

Page 36

you consider to be responsible for foundational work in this field, that are most known as sources of research in the field?
A. Many institutions have produced robust research. Many institutions have collaborated to produce robust research. At this point in time, I don't consider anyone to be superior or leading the field compared to others.
Q. Is it consistent with your understanding that the Vrije University in Amsterdam is particularly noted for its foundational research in this field?
A. It's my understanding that they produced some of the initial studies on medical treatments for gender dysphoria and youth.
Q. Do you know whether their doctors continue to publish some of the most respected work in this field?
A. I personally have not seen research from, to the best of my knowledge, from an individual with that institutional affiliation within the past six months or so.
Q. Let me ask you to look at Exhibit 5. And is this a paper that you have studied with some care in connection with preparing your Expert Report

Page 37

for this litigation?
A. Yes, we just reviewed a paragraph that I read about it.
Q. And looking in the abstract, there's a heading that says "Participants." And it refers there to, and states there, that all 324 sex reassigned persons in Sweden across a span of 30 years were included in the study; correct?
A. That's what it says.
Q. And by including all subjects who received sex reassignment surgery across those years, this study design avoids possible methodological problems that might be related to cherry-picking an unrepresentative sample, correct?
MS. LEVI: Object to form.
A. I would not be able to say that.
Q. And why is that?
A. Let me review the methodology.
Q. Let me ask you a question separate from this paper, then, to save time.
Do you have a view as to whether a study that includes all patients who have undergone a certain procedure within a clinic avoids potential methodological risks associated with cherry-picking an unrepresentative sample that may

Page 38

afflict a study that is based on only a subset of patients treated for a particular condition?
A. I don't agree with that categorically. It would be highly dependent on several factors, such as the time period during which that study was conducted, the methods that the study used, the diagnostic criteria that the investigators used to identify patients of interest, and the way that outcomes were measured.
Q. In the Dhejne study, it tells us on page 2, at the top of the second column, that mental health issues were measured by reference to -- not based on self reports, but by reference to national health records. Is that consistent with your understanding?
A. The National Health System captured diagnostic codes in accordance with international classification of disease codes from 1969 to 1986, and then 1987 to 1996; and then 1997 to the study's time of publication, which I believe was --
Q. 2011, if you look at the bottom of the page.
A. So then it would have been the time at which the data capturing period concluded, which was 2003.

Page 39

Q. And my question was, are you aware that in the Dhejne study to measure mental health, they referenced national registry records, rather than self reports by patients. Is that consistent with your understanding of the study?
A. Can I have the question back one more time.
Q. I'll just say it, I'll ask again.
Is it consistent with your understanding of the Dhejne study that the authors measured mental health of the subjects by reference to diagnostic records from national registers, rather than self reports from the study subjects?
A. They used international classification of disease categorizations that are very different now than they were at the time regarding diagnoses pertinent to gender dysphoria.
Q. That has nothing to do with the question I asked.
MR. BROOKS: Let me ask the reporter to read it back.
(THE REPORTER READ THE RECORD)
A. What I said is true and important for contextualizing this study. And what I'm also pausing on is how you're characterizing mental health versus how the investigators are

Page 40

characterizing their outcomes.
Q. Let me ask a simpler question.
Dr. McNamara, do you know or not know whether in this Dhejne, et al study from 2011, the authors relied on self reports from patients; or, on the contrary, whether they relied only on medical and mental health records?
A. The authors themselves did not engage with the patients and ask them specific questions. But some of the measures that were captured in the medical records were gathered on the basis of physicians talking to their patients.
Q. Do you have any knowledge from your study of the Dhejne, et al paper as to how many of the subjects of that study had experienced childhood onset gender dysphoria?
A. I would need to review the paper in depth to see if there's any mention of that. Off the top of my head, I'm not sure.
Q. That's not something you recall. Okay, we'll leave it there. Let me ask you to --
MS. LEVI: Do you need a break?
THE DEPONENT: We could take a break. Are you done with this study?
MR. BROOKS: I am done with that study.

Page 41

MS. LEVI: Going close to an hour, I think.
MR. BROOKS: That's fine. We can spend our seven hours however you like.
MS. LEVI: I understand.
THE DEPONENT: We won't shortchange you.
(R E C E S S)
BY MR. BROOKS:
Q. Let me ask you to find, again, Exhibit 4, your Expert Report. And if you would find page 23 in that report. At the very bottom, there's a heading, text that carries over, that says "Research shows gender identity has a strong innate biological basis." Do you see that?
A. Yes.
Q. When I turn over to the text underneath that heading, is there anywhere in that, the two paragraphs under that heading, in which you identify any research that you believe shows a strong innate biological basis for gender identity?
A. I believe I cited various articles that contained discussions of research supporting biological basis of gender identity. And I would need to source citation 63, 65, Bauer, et al, and

Page 42

some others in order to point to you where.
Q. Is there any sentence in those two paragraphs that you would point me to that addresses the question of biological basis for gender identity?
A. Again, I would have to point to the citations. This report is heavily cited.
Q. My question is this: Did you write a single sentence of text in support of the proposition that gender identity has a biological basis?
A. No, not in this section.
MR. BROOKS: Let me ask the reporter to mark as Exhibit 6, Endocrine Society Guidelines from 2017.
(DEFENDANT'S EXHIBIT 6 FOR IDENTIFICATION Received and Marked.)
Q. And Dr. McNamara, you cite these guidelines in your report, do you not?
A. I do.
Q. And do you consider yourself to be well familiar with them?
A. I have reviewed them a few times.
Q. Do you have occasion to consult them in the ordinary course of your professional practice?
A. Generally not. In clinical practice, I

Page 43

have.
Q. They're not relevant to your practice to any extent?
A. I have practiced in accordance with some of the guidelines when it comes to referrals and how -- but otherwise, no.
Q. Let me ask you to turn to page 3876. In the first column, I'm going to direct your attention to the first paragraph.
Let me ask you to read -- well, let me just read into the record the first sentence.
"With current knowledge, we cannot predict the psychosexual outcome for any specific child."
Let me ask you this: Are you aware -- and these guidelines, just to be clear, are from 2017. Are you aware of any of the literature up to the present that has identified any measurable genetic basis that permits doctors to, for instance, take a blood sample from a newborn and predict whether that child will develop a transgender identity?
A. Not familiar with that.
Q. You're not aware that any such genetic marker has been identified?
A. I'm not aware that any such genetic marker has been identified.

Page 44

Q. And up to the present, so far as you know, there's nothing in the literature that has identified any hormonal marker that would enable a doctor to take a blood sample from a child and determine or predict whether that child would develop a transgender identity, correct?
A. I am not aware that there's any hormonal marker that would predict gender identity.
Q. And when you have seen a teen who may be suffering from gender dysphoria, you're not aware of any genetic test or hormone test that could tell you whether an adolescent presenting in a clinic actually has a transgender identity?
A. No, I'm not aware of any tests like that.
Q. Outside of genes and hormones, what, in your professional opinion, is a strong biological basis for gender identity?
A. I'm familiar with studies that I have not cited in my Declaration, but that I have reviewed, that show differential brain structures between cisgender people and transgender people with the same sex assignment at birth. And I also know, based on other studies, that gender identity is highly resistant to change when subject to efforts to try to change it.

Page 45

Q. You have written, however, have you not, that an adolescent's self experience gender identity does sometimes change.
A. I have -- are you referring to my Declaration?
Q. I'm not referring to your declaration.
A. Okay. Well, that is what some muse experience what gender dysphoria is. They may have grown up socialized and considered themselves in a conscious level as a gender that aligns with their sex assigned at birth, and then their conscious experience changed.
Q. Am I correct that it is your professional opinion that there is no definitive basis for determining an individual's gender identity other than their self perception?
MS. LEVI: Object as to form.
A. The diagnostic criteria are not a binary question of yes or no. They require six different areas, some of which must be satisfied for a minimum period of six months, to determine whether or not somebody has gender dysphoria. I would not consider that to be self report. I would consider that to be a diagnosis made after a clinical assessment.

Page 46

Q. Is it your testimony and/or belief that an individual cannot have a transgender gender identity unless they satisfy diagnostic criteria for gender dysphoria?
A. No, not necessarily. Those things are not mutually exclusive.
Q. So let me ask you again. In your opinion, is there any basis for definitively determining an individual's gender identity, other than that individual's self perception?
A. Self perception is a way to understand a person's gender identity, as it is a way to determine many different experiences one might have with various health or disease issues. Migraines, for instance, we can only use self report. I only say that so that I can contextualize what I'm saying so that it's clear that that's not exceptional or unique to gender identity.
Q. It's not your view, is it, that every child who suffers from gender dysphoria necessarily has a stable transgender identity?
MS. LEVI: Object as to form.
A. I would not be able to opine on that because it's an absolute comment -- excuse me, it's an

Page 47

absolutist comment about every child. So I don't -- I don't have an opinion on your specific question.
Q. Well, do you consider the question of whether every child who satisfies the diagnostic criteria for gender dysphoria must necessarily have a transgender -- a stable, true transgender identity to be beyond your professional expertise?
MS. LEVI: Object as to form.
A. I don't perform those assessments myself, so I don't have clinical experience in the area that you're asking me about.
Q. Do you consider it to be beyond your professional expertise?
A. Say what you're considering to be beyond my --
Q. I will.
A. Please repeat your question.
Q. The question is -- let me start, is the question of whether every child who satisfies diagnostic criteria for gender dysphoria has an innate transgender identity, one that is beyond your professional expertise?
MS. LEVI: Object as to form.
A. It's not something that I can opine on

Page 48

today.
Q. And is that because it's outside of your professional expertise?
A. It's because I can't opine on it today.
Q. Well, let me ask it differently.
Do you consider that question to be one that's within your professional expertise, but you just don't know the answer to it?
A. What I said before is that I don't perform psychological assessments on prepubescent children with gender dysphoria. That is outside of my professional expertise.
MR. BROOKS: Let me ask the reporter to mark as McNamara Exhibit 7, a Scientific Statement from the Endocrine Society dated 2021, titled "Considering Sex As a Biological Variable."
(DEFENDANT'S EXHIBIT 7 FOR IDENTIFICATION Received and Marked.)
Q. Dr. McNamara, is this a document that you're familiar with?
A. I don't believe so.
Q. You have referred to the 2017 Endocrine Society Guidelines that we looked at earlier in your Expert Report, correct?
A. That's correct.

Page 49

Q. And do you consider the Endocrine Society to be a respected and reliable scientific voice?
A. I do.
Q. You have never reviewed this document so far as you recall?
A. I don't believe so, no.
Q. The document is entitled a Scientific Statement from the Endocrine Society published in Endocrine Reviews in 2021. So it's about four years more recent than the guidelines that you cited. Do you see that is in the date at the top, as it happens.
A. I do see that, yes.
Q. And, as such documents tend to be, has a long list of authors that I will not attempt to read into the record. But the first is Bhargava, B-H-A-R-G-A-V-A.
Let me ask you to turn in this document, I'm just going to ask you about a few factual assertions in the document to see whether they match your scientific understanding.
Page 221, column one, there's a heading that says "Biological Sex: The definition of Male and Female."
A. I'm with you.

Page 50

Q. It says in the third line of text under that heading, "All mammals have two distinct sexes."
You've been in medical school. You've had high school biology. Is it consistent with your scientific understanding that all mammals have two distinct sexes?
A. I am more familiar with sex as a multidimensional variable that takes into account endogenous hormone production, genitalia, genetics, and other features.
Q. So if the Endocrine Society, in their Scientific Statement published in 2021, asserts that "All mammals have two distinct sexes," you simply disagree?
A. No, not necessarily. The rest of this document goes into detail, many other things that I have just laid out very briefly. There are also other places where sex is discussed.
Q. Well, let me take you to another one of those, just a little bit farther down, maybe eight lines down, the same section. I'll read the following text:
"The classical biological definition of the two sexes is that females have ovaries and make larger female gametes (eggs), whereas males have

Page 51

testes and make smaller male gametes (sperm)." Obviously, that expression here in the context of mammals.
Is that definition of the classical biological definition of the two sexes one that -- let me start that question again.
Do you agree or disagree that what the Endocrine Society authors have recited here is indeed a classical biological definition of the two sexes?
MS. LEVI: Object as to form.
A. The word "classical" seems quite subjective here. I'm not sure how the authors are using it. I might need a little bit more context on the intention in using that word before I could offer an opinion either way.
Q. Based on your own medical knowledge and education, do you agree or disagree that, among mammals, a widely used biological definition of the two sexes is that females have ovaries and make larger female gametes, generally referred to as eggs, whereas males have testes and make smaller male gametes, referred to as sperm?
A. In medical school, I didn't learn about mammalian biology as a general concept. I learned

Page 52

about human biology. And I learned about variations in sex based on several nuanced biological factors.
Q. Let me take you down, there's a paragraph that begins, "In mammals, numerous sexual traits." Do you see that?
A. Yes.
Q. And the second sentence in that paragraph begins "The type of gonads is controlled by the presence of XX or XY chromosomes." Do you see that language?
A. Yes.
Q. And do you agreed or disagree with that assertion by the Endocrine Society authors?
A. That's correct.
Q. Let me ask you to turn to 225. And there, I call your attention -- let's see here. Give me a moment to find it.
Midway down the column, 225, is a sentence that begins, "Similar masculinizing effects." Do you see that?
A. No, are you in the --
Q. 225, column two.
MS. LEVI: It's right here.
Q. I may not have said column two. And right

Page 53

after that is sentence that I will read into the record.
"Second, all aspects of neural development are capable of being organized or programmed by sex steroids. This includes cell generation(as read), migration, myelination, dendritic and axonal growth and branching, synapse formation, synapse elimination, and neurochemical differentiation."
MS. LEVI: Just, I think you said "generation," and it's "genesis."
MR. BROOKS: I'm sure you're right.
MS. LEVI: Okay.
MR. BROOKS: You try reading that.
MS. LEVI: Fair enough. Just would like the record to be accurate.
MR. BROOKS: Thank you.
Q. Let me ask whether you agree or disagree or consider it outside your professional expertise whether all these listed aspects of neural development are capable of being organized or programmed by sex steroids?
A. So just getting some context with this paragraph here, it does seem like they might be referring to a differentiation between primates

Page 54

and rodents.
"To discern whether the biological basis of sexual differentiation of sexual differentiation of brain and behavior differs between primates and rodents, one needs to identify mechanisms by which steroids transduce signals to modify the trajectory of the nervous system. While those mechanisms are incompletely understood, a few general principles are clear. First" -- and this is one concept. I'll skip to what you just read.
"Second, all aspects of neural development are capable of being organized or programmed by sex steroids."
Q. My question for you about the second sentence you just read is do you believe that to be true, false, or outside your personal expertise?
A. And my response is this sentence seems to pertain to primates and rodents, and that does definitely fall outside of my expertise.
Q. And if I ask the same question about human development, that is, is it true in the case of human development, brain development, that all aspects of neural development are capable of being organized or programmed by se steroids, do you

Page 55

consider that also to be outside your expertise?
A. That seems like it would fall much more under the expertise of a neuroscientist. And that, I am not.
Q. Okay, all right.
MR. BROOKS: Let me ask the reporter to mark as Exhibit 8, an article entitled "Protecting Transgender Health and Challenging Science Denialism and Policy" by Dr. McNamara and two other authors.
(DEFENDANT'S EXHIBIT 8 FOR IDENTIFICATION Received and Marked.)
Q. And Dr. McNamara, is this in fact an article that you coauthored sometime in 2022?
A. Yes, it is.
Q. And am I correct that the authors -- you're obviously a doctor. Anne Alstott is a law professor; am I correct?
A. Yes.
Q. And Christina Lepore was a law student?
A. No, Ms. Lapore is a soon to be graduating medical student.
Q. A medical student. And obviously, two years earlier from graduating when this was written. Is it the case that the medical and scientific

Page 56

assertions in this article are based on your knowledge?
A. Based on the combined knowledge of all authors.
Q. Well, were you resting scientific assertions on the knowledge of a lawyer?
A. Certainly not.
Q. Oh, good. So the science, you would say, is the combined input of you and Christina Lepore, a medical student?
A. Mm-hmm.
Q. Okay. Let me ask you to turn -- and did you edit this carefully? Before it went out the door, did you consider every sentence in this to represent your professional opinion?
A. Absolutely.
Q. Let me ask you to turn to the first page. And there, you refer, towards the bottom of the first column, to a false -- "false claims about risks associated with treatment." Do you see that?
It's an inch from the bottom of the first column.
A. Yes.
Q. Is it your testimony that any scientist or

Page 57

medical policy maker who expresses -- who asserts that there are potentially serious risks relating to administering puberty blockers or cross-sex hormones to minors, is making false claims?
A. In preparation for writing this piece in the New England Journal, I did a thorough inventory of claims regarding risks of treatment and how emphatic or emphasized they were. And I identified several claims that were incorrect or overly emphasized at the expense of discussing the benefits of care.
It is not my opinion that everybody who discusses risk is denying scientific fact. That would not be a fair characterization of what this sentence means here.
Q. And that's exactly the clarification I am asking for. That is, it is not your opinion that every doctor or medical authority who expresses concern that there may be serious risks associated with administering puberty blockers or cross-sex hormones to minors is making false claims?
MS. LEVI: Object as to form.
A. We would need to review specific claims in detail so that I could offer my opinion, my expert opinion on whether or not I felt that those claims

Page 58

were false or overemphasized.
Q. And if you look at the third column, also about an inch from the bottom, there's a sentence, maybe an inch and a half, that reads "State laws banning gener-affirming care make similarly unsupported claims about risks of cardiovascular disease, thromboembolic events, and cancer associated with administration of exogenous estrogen and testosterone."
To clarify, it is not your expert opinion, is it, that any medical authority or doctor who asserts that there are serious risks associated with administering puberty blockers or cross-sex hormones to minors is necessarily making unsupported claims?
MS. LEVI: Object as to form.
A. Your use of the word "serious" is subjective and I'm unsure of its meaning. But it is entirely possible and common, and what I'm referring to here, that risks have been overrepresented, incorrectly characterized and overemphasized.
Q. Let me ask you to turn to the second page of your article. And in the third column, the final paragraph begins "Bans on gender-affirming care are grounded in science denialism." Do you see

Page 59

that?
A. I do.
Q. Is it your expert opinion that anyone who asserts that hormonal interventions in minors imposed serious risks of harm that have not yet been adequately studied is guilty of science denialism?
A. I would need to review specific statements and comments in order to opine as to whether or not that is the case. And in this article, I cite numerous instances of that.
Q. A little bit above this, in the previous -- the preceding paragraph in column three of page 1920 in Exhibit 8, you refer to reports that are "composed by subject matter experts without conflicts of interest." Do you see that?
A. Yes.
Q. And what is your understanding of what constitutes a conflict of interest?
A. A conflict of interest entails some sort of compensation for the work. Usually it's financial or something that could be construed as having some sort of financial value.
Q. In your opinion, does a clinician who derives a significant percentage of his or her

Page 60

practice from treatment of minors for potential gender dysphoria, face a conflict of interest in opining on the risks or benefits of such treatments?
A. No. Physicians discuss risks and benefits of treatment as part of their commitment to patient care. It's far removed from the concept of conflicts of interest.
Q. Well, I thought you just told me that a financial conflict of interest would exist where an individual had a financial interest in the performance or nonperformance of the treatment at issue.
MS. LEVI: Object as to form.
A. Conflicts of interest in the medical world pertain to specific services outside of your clinical care; things that don't necessarily pertain to clinical care.
If a researcher or physician had received compensation for writing something or endorsing a product, that would be a conflict of interest and that would need to be disclosed. But the provision of patient care, which does receive financial remuneration, is not considered to be a conflict of interest in my profession.

Page 61

Q. So in your view, a physician who derives his larger share of his or her personal income from providing hormonal treatment of minors for gender dysphoria, does not face the financial conflict of interest in commenting on a law that prohibits such treatments?
A. Say that one more time, please, if you don't mind.
MR. BROOKS: I'll ask the reporter to read that.
(THE REPORTER READ THE RECORD)
A. I don't think so, no.
Q. And in your view, does a clinician who would face large malpractice liability if juries ultimately conclude that hormonal intervention in minors were harmful and unjustified, face a financial conflict of interest in commenting on a law that prohibits such therapies?
MS. LEVI: Object as to form.
A. I feel like that's outside my scope of expertise. I have very little knowledge of medical malpractice.
Q. My question wasn't about medical practice, it was about conflict of interest.
A. You referenced medical malpractice.

Page 62

Q. You're aware of the concept of doctors being held financially responsible for harming patients?
A. My understanding of medical malpractice is that physicians can obtain insurance and their covering institutions protect them from being financially vulnerable to such cases. That's where my knowledge ends. And I am unsure how to answer your question without knowing more.
Q. All right. Do you have any understanding of the conflict -- of the concept of intellectual conflict of interest?
A. No.
Q. All right. Let me ask you to find your Expert Report, Exhibit 4, and turn with me to page 6. And just under the heading C, you begin, the first paragraph there, with the statement "Adolescents undergo a critical period of cognitive and social development between the ages of 11 to 18." Do you see that?
A. I do.
Q. And you would agree with me, would you not, that both those endpoints are -- let's just say soft numbers. That is, there's -- for example, there's evidence that cognitive development continues after the age of 18.

Page 63

A. Correct.
Q. Okay. Can you explain to me what you meant when you wrote that adults undergo a critical period of cognitive development within that general age range?
A. You said "adults." I believe you meant to say "adolescents."
Q. Let me ask it again. Explain to me what you meant when you wrote that "Adolescents undergo a critical period of cognitive...development between the ages of 11 to 18."
A. I said "Adolescents undergo a critical period of cognitive and social development between the ages of 11 to 18."
And by that, I mean that that time period of a young person's life, which does not exclude the possibility of similar changes before or after, undergo a great deal of change and development in those domains. They begin to experience formative social relationships outside of their families and their immediate home environments. They begin to develop romantic relationships. They develop skills and talents as connections between the midbrain and the prefrontal cortex are being formed. And that can help those young people

Page 64

retain those skills and talents in adulthood.
Q. Let me focus, if I may, on the cognitive development. You've testified that you're not a developmental psychologist or a neurologist, all these things. But what did you -- what were you referring to specifically when you wrote that adolescents in that time period undergo critical stages of cognitive development?
A. So as an Adolescent Medicine specialist, adolescent cognitive development regarding risk/benefit analysis, health decisionmaking, educational function, all of that being pertinent to cognition and cognition change, is becoming more adult-like during those years. Adolescents are undergoing changes that are highly individually dependent.
Q. Are you familiar with the term "executive function"?
A. Yes.
Q. And what does that refer to in the area of cognitive development?
A. "Executive," meaning to execute or to make decisions in various scenarios.
Q. You're asking me?
A. That's not a question. Sorry. Would you

Page 65

like me to rephrase what I just said?
Q. Please.
A. So executive function refers to the ability to execute or make decisions in various scenarios.
Q. And is that a capability that is known to develop in important ways across the adolescent years that you've bracketed here?
A. It's certainly known to change. It's present in many ways, but it is known to change during this time.
Q. Well, let me take you out of the clinic for a moment. Have you, yourself, raised a child through adolescence?
A. I would prefer not to answer any personal questions about my life in this deposition.
Q. I'm sorry, but I'm asking the question.
A. And when you say "raised," do you mean as a parent?
Q. I do.
A. I have not raised an adolescent.
Q. But you have seen many adolescents in your practice.
A. Yes, I have.
MR. BROOKS: Let me mark as Exhibit 9 an article with the lead author Diane Chen from 2023

Page 66

entitled "Psychosocial Functioning and Transgender Youth after Two Years of Hormones."

(DEFENDANT'S EXHIBIT 9 FOR IDENTIFICATION Received and Marked.)

MS. LEVI: You okay to keep going?

THE DEPONENT: Yes, we can go through this one.

Q. And Dr. McNamara, is this an article that you refer to in your Expert Report?

A. Yes, it is.

Q. Are you familiar with the reputation of Diane Chen?

A. Yes, I am.

Q. And what is that reputation, in your view, in the field of gender medicine?

A. Dr. Chen is a well-regarded psychologist who has contributed a great deal of clinical research to this field.

MR. BROOKS: Let me ask the reporter to mark as Exhibit 10, another article with Diane Chen as the lead author entitled "Consensus Parameter: Research Methodologies to Evaluate Neurodevelopmental Effects of Pubertal Suppression in Transgender Youth" from 2020.

(DEFENDANT'S EXHIBIT 10 FOR

Page 67

IDENTIFICATION Received and Marked.)

Q. And let me ask whether this is a paper that you are familiar with.

A. I have skimmed this before. I don't believe it's one that I have cited --

Q. I think that's the case.

A. -- in any of my Declarations.

Q. But you have read it yourself?

A. Yes, as I mentioned, I skimmed it.

Q. And without asking you to read all of them, going through the list of affiliations of the coauthors which appear on the first page, you would agree with me, would you not, that this paper is could authored by a lineup of authors from quite a number of high reputation research institutions.

A. I would agree with that.

Q. Are you familiar with a process called a Delphi Consensus Procedure?

A. I am only very loosely familiar with it.

Q. Then I will not ask you questions about that.

A. Okay.

Q. You haven't participated in a Delphi --

A. No, I have not.

Page 68

Q. -- Consensus process yourself, okay.

Let me ask you to turn to page 248.

A. Of which document?

Q. I'm sorry, Exhibit 10. You can put Exhibit 9 to one side. We won't -- probably won't be coming back to that. We'll see.

MS. LEVI: I'm sorry, 248, did you say.

MR. BROOKS: 248.

Q. And just to kind of connect this to what we've just been discussing, midway down, a sentence begins "The pubertal and adolescent period is associated with profound neurodevelopment." You see that language?

A. I do.

Q. And that's consistent with what you were just explaining to me, am I correct?

A. Yes, I would say so.

Q. And that goes on to say "including trajectories of increasing capabilities for abstraction and logical thinking, integrative thinking (e.g., consideration of multiple perspectives), and social thinking and competence." Do you see that language?

A. I do.

Q. And do you agree or is it outside your

Page 69

expertise that now well-established neuroscience tells us that the maturation process that we call puberty and adolescence includes profound developments that affect the capability for logical thinking, social thinking, and competence?

A. Could you -- could I hear your question again, please.

MR. BROOKS: Yes, I'll ask the reporter to help me out.

(THE REPORTER READ THE RECORD)

A. Social thinking, competence, and then there was one initial thing you mentioned.

Q. Logical thinking, which is a clause that I took out of the sentence that we --

A. I see.

Q. -- just read.

A. Yeah, I would agree with that.

Q. And let me ask, take you a little bit farther down.

An inch and a half down, there's a sentence that begins, two-thirds of the way along the line -- it's hard to find these things -- that begins "At the level of the brain." Let me ask you to find that.

A. I see it.

Page 70

Q. Okay. And that says "At the level of the brain, several primary neurodevelopmental processes unfold during adolescence, including myelin development and changes in neural connectivity, synaptic pruning, and gray matter maturation, changes in functional connectivity, and maturation of the prefrontal cortex and the social brain network."

MS. LEVI: There's no -- there's no quote at the end of the sentence.

MR. BROOKS: I'm closing my quotation.

MS. LEVI: Got it.

Q. And this is referring more to physical, measurable brain development, rather than more abstract descriptions of capabilities, correct?

A. That's correct.

Q. And is it -- are the physical changes in brains during adolescence that are described in the sentence I just read into the record accurate, to your knowledge, or going beyond your professional expertise?

A. I have enough expertise to agree with the sentence.

Q. Okay. Would you agree that these known facts about brain development during puberty raise

Page 71

the possibility, at least, that blocking normal, healthy puberty hormones produced by the child's body may have some effect on the child's brain development?

MS. LEVI: Object as to form.

A. So I would say that these processes are not solely and exclusively dependent on pubertal maturation to unfold. Adolescence is also characterized by rapidly changing social environment and that sex hormones are one of a few influential factors that support this type of brain development.

Q. What knowledge do you have, if any -- strike that.

Can you point me to any study that informs us as to what extent the changes described in the sentences I just read from Chen, et al 2020, are driven by puberty-linked hormones versus other factors, such as social environment that you've just described?

A. I'm looking at the reference list to see if I reviewed any of the papers that they cite in this paragraph. Nothing looks familiar to me.

This is a fact that I generally understand from my fellowship training, understanding that

Page 72

this is a criteria of my board certification.

For my immediate recollection, I cannot list a study. However, I am sure I could source some if given the opportunity.

Q. Well, let me back up and ask you again. The known facts about brain development during puberty that are recited in Chen, et al, that you have agreed with a moment ago, you would agree, raise the possibility that blocking normal pubertal hormones produced by the child's body may have some effect on the child's brain development?

A. This paragraph as it's written does not contain any information about pubertal blockade or the presence or absence, or the influence of sex hormones specifically.

Q. My question for you as a scientist is, do you agree, disagree, or consider it outside your expertise to say that the known facts about brain development during puberty raise the possibility that blocking normal, healthy pubertal hormones produced by the child's body may have some effect on the child's brain development?

A. I am loosely aware of research that has listened to that question. It would not be proper for me to offer an opinion without having done an

Page 73

in-depth analysis on relative research that could be used to answer your question. So I consider cognitive development in the setting of pubertal blockade to be something that is outside the scope of my expertise as it's represented in the literature.

Q. All right. Based on your review of Chen, et al 2020, you understand that what that paper does is propose some methodology or metrics that the authors believe should be deployed to study the question of whether pubertal blockade may have an impact on the child's brain development; correct?

A. Let me just read the abstract for a second to refresh myself.

So the purpose of this study was to identify methodologies for studying the impact of pubertal blockade on cognitive function in adolescents by gender dysphoria.

Q. To your knowledge, no study applying the methodology recommended by Chen, et al in 2020 has yet been published, correct?

A. I couldn't opine on that one way or the other.

Q. So far as you know today -- let me put it in a way that's easier to answer.

Page 74

As you sit here today, you're not aware of any study applying the methodology recommended by Chen, et al in 2020 that is in process today?
A. I cannot offer any answer to that question. I don't know.
Q. The sense of the question was you're not aware; you can't offer an answer, you're not aware --
A. I'm unaware.
Q. -- of any such study, okay.
A. I would not have a reason to be aware, having not done an in-depth look at the literature.
Q. And in your report, in your supplemental report, you don't actually offer any opinion as to whether the use of puberty blockers in adolescents as a treatment for gender dysphoria, does or does not have any negative effect on the child's brain development, do you?
A. I don't discuss any studies pertinent to brain development in my supplemental report. But I do discuss several studies that describe psychosocial functions and mental health improvements.
Q. It is also the case in your original report,

Page 75

you don't offer any opinion as to whether applying puberty blockers adolescents as a treatment for gender dysphoria does or does not have any harmful effect on the child's brain development?
A. Similarly, I don't source any studies on cognitive development. But I do discuss several studies that show stability or improvements in various domains of mental health and/or gender dysphoria.
Q. You would agree, would you not, that mental health and cognitive development are not the same concept?
A. I would not agree that they're entirely distinct; that there is overlap. And that untreated or worsening mental health conditions can certainly limit one's ability to develop cognitive skills in adolescence.
Q. You would agree, would you not, that mental health and cognitive development are not the same concept?
A. I agree that they're overlapping concepts that are interrelated.
Q. Would you agree that they are not the same concept?
A. They don't overlap completely, but they're

Page 76

intrinsically linked.
MS. LEVI: I think she's answered the question. You asked it three times now.
MR. BROOKS: Fine.
Q. Do you agree, as a clinician, that knowing whether the administration of puberty blockers adolescents during years of natural pubertal development has a lasting negative impact on brain development, is an important question for clinicians, for parents, for health policy experts, tasked to decide whether or not to administer puberty blockers to minors?
MS. LEVI: Object as to form.
A. Can I have the question back, please.
(THE REPORTER READ THE RECORD)
A. It is one of many questions that should be considered in a medical decisionmaking process between a physician, a parent, and a patient. And there are many others that should be considered simultaneously.
Q. You, as a clinician, would want to know the answer to that question if at all possible, right?
A. I would want to know the answer to that question alongside and at the same time as the answer to the question of what happens to

Page 77

cognitive function when gender dysphoria progresses without intervention.
Q. And in fact, there's a great deal about brain development in adolescents undergoing alternative treatment for gender dysphoria that just isn't known at present, correct?
MS. LEVI: Object as to form.
A. I am unaware of any alternative treatments to gender dysphoria or what you may mean by that.
Q. Let me rephrase the question. There's a great -- there's a great deal about the effect of puberty blockers or cross-sex hormones in the brain development of adolescents that we simply don't know yet, correct?
A. Can I have the question back?
(THE REPORTER READ THE RECORD)
A. There is a great deal that is known and unknown, as is the case in many different domains of medicine.
MR. BROOK: Let me ask the reporter to mark as Exhibit 11, an article by Drs. Leibowitz and de Vries entitled "Gender Dysphoria in Adolescence."
A. Shall we set these aside?
Q. Yes.

(DEFENDANT'S EXHIBIT 11 FOR IDENTIFICATION Received and Marked.)

Q. Let me ask first whether you professionally know either Dr. Leibowitz or Dr. de Vries?

A. I don't.

Q. Do you know -- do you have any opinion as to the professional reputation of Dr. de Vries?

A. I know that Dr. de Vries is a well-known researcher and clinician in this field.

Q. And she is associated with the Vrije University clinic that I mentioned earlier. Is that consistent with your recollection?

A. I will take your word for that. I'm not sure what VU University Medical Center in Amsterdam refers to, but perhaps that's an abbreviation.

Q. It refers to -- and I'll spell this for you since it's Dutch -- Vrije, V-R-E-I-J, University. So when I say "Vrije," it's V-R-E-I-J.

Is this a paper that you are -- you believe you have reviewed before now?

A. That's what I'm trying to figure out. It doesn't immediately look familiar to me.

Q. Do you know anything about Dr. Leibowitz's reputation?

A. I'm a little bit more familiar with Dr. Leibowitz, and that he is a well-respected psychiatrist who cares for gender diverse youth.

Q. Let me ask you to turn to page 30. And there's Table 2 there with two columns. One says "What is Known," and the second says "What is Not Known." Do you see that?

A. Yes.

Q. And these authors in the "What is Not Known" column say -- writing in 2016; I don't want to try to blur the years. Find what I'm looking for.

Under the "What is Not Known" column, they write "Unclear long-term effects on brain development in this population."

Do you consider these authors to be, in stating that it's unclear what the effect of pubertal suppression on brain development in adolescents may be, to be deploying scare tactics?

MS. LEVI: Object as to form.

A. Can I have the question back.

Q. Do you consider Dr. de Vries and Dr. Leibowitz, in stating that it is unknown what the long term effects on brain development in the adolescent population of pubertal suppression, to be deploying scare tactics?

A. I have no information to help me answer that question either way.

Q. Do you consider Dr. Leibowitz and Dr. de Vries to be science deniers?

A. No.

Q. Do you believe either of them to be transphobes?

MS. LEVI: Object as to form.

A. I do not know either of them at all.

Q. But you know their professional reputations to some extent, correct?

A. What you're describing reflects more of a personal belief that I would not have any knowledge of.

Q. And you would -- it is beyond your professional knowledge that Dr. De Vries is widely considered to be one of the seminal researchers in the field of treatment of gender dysphoria in minors?

A. I tend not to think about experts in this field on a concrete hierarchy like that, especially at this point in time, when there are so many who have produced solid research and contributed extensively to the field.

Q. You're not prepared to offer expert

testimony that it has been established by reliable evidence that use of puberty blockers to treat gender dysphoria in adolescents does not have negative long term effects on brain development in that adolescent population, are you?

A. What I can tell you is that a statement in a paper from 2016 is likely outdated, given the possibility of eight years of subsequent research that is not included in this paper.

MR. BROOKS: Let ask the court reporter to read back the question.

(THE REPORTER READ THE RECORD)

A. And as I answered, what I can tell you, and what I did tell you at the beginning, is that I had seen several articles looking into pubertal suppression and cognitive development, that I did not review them extensively for any of my reports; that I do not know what years they were published in. And I do not know whether or not they resulted from any of the methodologies that Chen and colleagues described in the 2020 paper. And that referring to a sentence in a paper from 2016 that describes unclear long-term effects may not hold true eight years later.

Q. My question for you today, as you sit here,

Page 82

is are you willing, today, to offer expert testimony that it has been established by reliable evidence that use of puberty blockers to treat gender dysphoria in adolescents does not have negative long-term effects on brain development?
A. That is not an area that I have formed an opinion on in this case.
Q. All right. Do you have an opinion as to whether that's a question on which, on the state of the science today, there's room for reasonable disagreement among scientists?
A. I don't have an opinion on that either.
Q. Let me take you a little closer to the present and ask the reporter to mark as Exhibit 12, a 2023 article by Dr. De Vries and another author named Hannema.
(DEFENDANT'S EXHIBIT 12 FOR IDENTIFICATION Received and Marked.)
Q. Is this an article that you believe you have seen before --
A. Yes, I have seen this before.
Q. -- today. And is it an article that you have referenced for any reason other than preparation for this litigation?
A. I don't believe so. It's not something I

Page 83

cited in my reports, either.
Q. Do you know anything about the reputation of Dr. Hannema?
A. Nothing.
Q. And as to Dr. de Vries, you have already testified. This is obviously much more recent; down the bottom it says January of 2023.
Let me call your attention -- and this is, just to be clear, this is not an article that is reporting on original research. This is a short -- what would you call it, a scientific comment? Is there a term you prefer for this sort of article?
A. It's in the editorial section of the New England Journal.
Q. And the New England Journal being a highly respected publication?
A. Yes.
Q. The New England Journal of Medicine, that is, to be clear.
Let me ask you to turn to page 276, in the second column. And an ultimate paragraph in the second column begins "Finally." Do you see that paragraph?
A. I do.

Page 84

Q. And there, Dr. de Vries writes "Finally, benefits of early medical intervention, including puberty suppression, need to be weighed against possible adverse effects - for example, with regard to bone and brain development and fertility." Do you see that sentence?
A. Yeah.
Q. And Dr. De Vries here, just last year, writes that benefits needs to be weighed against what she refers to as possible adverse events, including adverse effect on brain development; correct?
A. That is what the authors go on to say.
Q. So these authors, at least, as of last year, considered that adverse impact on brain development was still a possibility as of 2023; correct?
MS. LEVI: Object as to form.
A. It would not -- let me say that differently. One could not tell, based on this sentence, what evidence the authors had reviewed, if any.
Q. My question simply is, these authors, at least, as of last year, expressed the view that the possibility of adverse effects on brain development was or remains something that needed

Page 85

to be put in balance against benefits of puberty suppression; correct?
A. They express the need for weighing the risks and benefits, as is common practice.
Q. And indeed, you would agree that clinicians need to weigh possible adverse effect of puberty blockade, including possible harm to brain development and fertility, against potential benefits of puberty blockade; correct?
A. I would agree that they need to and further, that they do.
Q. And it's not science denialism to say that those possible negative impacts on brain development and fertility should be considered?
A. No, it's not.
Q. Indeed, you would agree, would you not, that ethical decisionmaking regarding the use of puberty blockers on adolescents need to weigh those risks?
A. Ethical decisionmaking needs to weigh the risks and the benefits simultaneously. Hyper-focusing on the risks without considering the benefits is not scientific.
Q. That is, leaving either the risks or the benefits out of the equation is not the way to go

Page 86

about ethical decisionmaking?
A. Ethical decisionmaking risks on a careful balance and consideration of risks and benefits, in partnership with a patient and the legal decisionmaker, if that applies.
Q. Let me ask you to find -- I think it's in the stack where -- the Endocrine Society 2017 Guidelines. That's Exhibit 6.
MS. LEVI: Are you likely to go back to Exhibit 12?
MR. BROOKS: I think the answer is no. Or if I do --
MS. LEVI: It's fine. It won't be far. It won't be far.
THE DEPONENT: And I think after this set of questions --
MR. BROOKS: Would you prefer to stop, take a break?
MS. LEVI: Take a break now?
THE DEPONENT: Yeah.
MS. LEVI: Just in terms of timing, do you want to take a short break, have more and then lunch? Do you want to take a longer break.
THE DEPONENT: Let's take about 10 minutes now and then come back.

Page 87

MR. BROOKS: I generally recommend to my witnesses that we not break at 12:00 because the afternoon is just brutally long.
MS. LEVI: I'm there. I just want to do whatever you need to do physically as well.
THE DEPONENT: We'll take a break.
MS. LEVI: We're just going to take a 10-minute break.
(R E C E S S)
MR. BROOKS:
Q. Do you now have Exhibit 10, Chen 2020, in front of you again?
A. Yeah, I do.
Q. Let me ask you to turn in that document to page 252. And there, about an inch and a half from the bottom, the sentence begins "The effects of pubertal suppression may not appear." Do you see that?
A. No.
Q. I'll give you a moment.
A. Could you tell me where it is again?
Q. First column, inch and a bit more from the bottom, the sentence begins towards the end of the line.
A. I got it.

Page 88

Q. All right. Let me just read that into the record.
It says "The effects of pubertal suppression may not appear for several years. Any GnRHa-related difference in brain structure is likely to be observed over the long term, rather than immediately."
Do you agree with the Chen, et al authors, or is it outside your expertise, that any effects of pubertal suppression on neurodevelopment might not appear for several years?
A. Outside the scope of my expertise.
Q. And do you agree or is it outside the scope of your expertise that any difference in brain structure resulting from puberty blockade is "likely to be observed over the long term, rather than immediately"?
A. Similarly, that is outside my scope of expertise.
Q. And you're not, as you sit here today, aware of any long-term study that has been undertaken of the effects of pubertal suppression on brain structure; correct?
A. "Long-term" is a very general phrase.
Q. Let me ask a more precise question. You're

Page 89

not aware, as you sit here today, of any multiyear study of the effect of pubertal suppression on brain structure?
A. I am not, and I have not done an in-depth analysis of the literature to try to find such studies.
Q. When discussing potential treatments for gender dysphoria with your patients, do you warn them that respected scientists have stated that effects on the child's brain development might not appear for several years?
A. I do not perform any clinical counseling regarding pubertal suppression used beyond a few months in patients who do not have gender dysphoria.
Q. Let me call your attention to the next sentence, beyond the one I read, which, still in column one, page 252, says "Shifts in social and affective learning processes might cause subtle short-term differences that could ultimately result in clinically impactful longer-term effects."
Let me ask what you think you understand what the authors are saying there.
A. It's difficult to discern the meaning of the

Page 90

sentence without understanding the article as a whole.
Q. Before I called your attention to this language, were you aware that the Chen, et al authors had expressed concern that administration of puberty blockers to adolescents might result in "clinically impactful long-term effects"?
MS. LEVI: Object as to form.
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
A. So I have not learned anything new from that language. I'm referring back to the abstract of this paper and the purpose of this study. Final sentence of the section "Purpose" under the abstract states "Given the widespread changes in brain and cognition that occur during puberty, a critical question is whether this treatment impacts neurodevelopment," in the context of preliminary evidence suggesting pubertal suppression improves mental health functioning.
Q. So as you have worked with patients and referred them to the gender clinic, you were aware that these authors, at least, had expressed concern that administration of puberty blockers to

Page 91

adolescents could result -- could ultimately result in clinically impactful long-term effect?
MS. LEVI: Object as to form.
A. Sir, I would draw your attention back to my prior testimony, when I discussed that I had two patients who I referred as minors to gender competent clinical services. And both patients had completed puberty. That was not context that I gave earlier.
I have not yet encountered a patient with gender dysphoria who may be eligible for pubertal blockade and referred them to a gender clinic. Further, I would not endeavor to perform counseling on medications that I myself would not be prescribing or managing.
Q. Is it your testimony that the 14-year-old girl that you referred to had, to use your phrase, quote, completed puberty?
A. Yes, that was my clinical assessment. The patient was Tanner Stage 5 in all domains of pubertal development, which means that puberty had been completed.
Q. And what is the relationship between that, and your opinion that we referred to earlier where you talked about puberty-related neurodevelopment

Page 92

between the ages of 11 and 18?
A. I don't understand your question.
Q. It is not your testimony, is it, that a 14-year-old girl has completed all aspects of neurodevelopment associated with puberty and adolescence?
A. Adolescence is still ongoing in a 14-year-old. It's a chronological, just as it is a social and developmental phase. And this particular patient we're discussing had not completed many aspects of puberty. But, in terms of physical maturation, the patient was Tanner Stage 5, which meant that in accordance with the standards of care and the Endocrine Society Guidelines, there would be no utility in using the puberty-blocking medication.
Q. Got it. Let me ask you to turn to page 248 in this Chen 2020. And if I can take you perhaps two inches down in the second column. It is a paragraph that begins, "The combination of animal." Just tell me when you've found that paragraph.
A. Got it.
Q. And the authors say that this evidence "supports the notion that puberty may be a

Page 93

sensitive period for brain organization; that is, a limited phase when developing neural connections are uniquely shaped by hormonal and experiential factors, with potentially lifelong consequences for cognitive and emotional health."
Do you see that language?
A. I do.
Q. And again, you've described the purpose of the Chen, et al paper and the questions that it poses.
Do you believe that by warning that interference with the normal process of puberty may have "potentially lifelong consequences for cognitive and emotional health," the Chen, et al authors are engaging in false and deceptive claims?
THE DEPONENT: Could I have the question back.
(THE REPORTER READ THE RECORD)
A. I don't hear that as a fair characterization of the writing of these authors. In the sentences that we are reviewing now, they do not appear to be referring to pausing puberty with puberty-blocking medications.
Q. That indeed is the focus and context of

Page 94

their entire paper and project; am I correct?
A. They are discussing endogenous puberty as well, and offering a great deal of background information. It's not the case that every sentence in the paper refers exclusively and directly to blocking puberty.
Q. Then let me take you to some sentences that do.
Just below that, two sentences, I believe, says "There is also some evidence to suggest that delayed puberty onset predicts slightly poorer adult functional outcomes." Do you see that language?
A. That is a sentence that refers to a study in citation 49 in the paper. And the title of that paper is on "Cognitive Consequences of the Timing of Puberty." I would need to look at that study and the study population that those authors reviewed, if this is even a clinical research study, in order to offer further context on the sentence you read. It's not clear to me if the citation itself is discussing people with gender dysphoria, adolescents with gender dysphoria. So I'm not sure how the sentence is relevant.
Q. Then let me take you to these authors'

Page 95

conclusion, how they think it's relevant.
The next sentence reads "Taken as a whole, the existing knowledge about puberty and the brain raises the possibility that suppressing sex hormone production during this period could alter neurodevelopment in complex ways, not all of which may be beneficial." Do you see that language?
A. I do.
Q. And in your view, by stating the possibility or asserting that the existing evidence "raises the possibility that pubertal suppression could alter neurodevelopment in complex ways, not all of which may be beneficial," these authors are engaging in science denialism?
A. These authors wrote a sentence describing the possibility that there may be some nonbeneficial impacts of suppressing [uberty. And that implies that there would be beneficial impact of suppressing puberty. I am presuming that they're referring now to the patient population of interest, which is patients with gender dysphoria. And I would take this sentence as a measured and thoughtful comment in isolation, and not as a denial of fact, because the sentence includes a balance between risks and benefits.

Page 96

Q. To your mind, for these authors to raise a concern that one of the costs, one of the risks that needs to be balanced is that puberty blockers could alter neurodevelopment in ways that are not beneficial, is not science denialism?
MS. LEVI: I think she's answered the question, but you can answer it again.
A. I think I --
MR. BROOKS: Let's hear the question back because I don't think you have.
A. So this paper provides a substantive introduction that summarizes evidence on positive outcomes observed in youth with gender dysphoria who qualify for and are offered pubertal suppression. And it also discusses the possibility of risks.
To me, that is an example of an instance where there is no science denialism, but rather a faithful engagement of risks, benefits, potential unknowns, and knowns.
Q. Is it fair to say that in evaluating whether a treatment should be offered or not offered for an individual, just picking up on what you just said, that a clinician, or for that matter, a parent, should consider both known benefits, known

Page 97

risks, and potential unknowns?
A. That's what Informed Consent discussions entail.
MR. BROOKS: And let me ask the reporter to mark as Exhibit 13, a 2023 Review Article by Sallie Baxendale of the University College London.
(DEFENDANT'S EXHIBIT 13 FOR IDENTIFICATION, Received and Marked.)
Q. Let me ask first, Dr. McNamara, whether this is an article that you have seen before today?
A. I have seen this article.
Q. And are you familiar with the journal Acta Pediatrica in which it was published?
A. I have heard of it before.
Q. Do you know anything about its reputation in the field?
A. I do not.
Q. And are you familiar generally with the reputation of the University College London as a research institution?
A. Not really, no.
Q. Now, this is a review article; so it says at the top. Do you have an understanding generally of what a review article -- what it means that an article is a review article?

Page 98

A. Yes, I do.
Q. What is that?
A. A review article does not present original previously unpublished research. It summarizes existing evidence in a particular area of interest.
Q. When did you first read this article?
A. This article was accepted January 30th of 2024. I believe I reviewed it perhaps a month ago.
Q. Okay. In connection with your work for this litigation?
A. Correct.
Q. Let me take you to the second page. Down towards the bottom of the first column is a heading that reads "Puberty as a Critical Window in Neurodevelopment." And that paragraph continues into the second column. I want to read the first sentence that begins in the second column.
That says "A period is defined as a critical window if the brain requires a specific input to allow for the optimal development of a particular function, e.g., exposure to language or visual stimuli. If the neural network is left without

Page 99

the correct input or stimulation, the functions served by that circuit will be permanently compromised."
Is the concept of a critical window in neurodevelopment one that you are familiar with, or do you consider that to be outside your personal expertise?
A. As a pediatrician, I'm certainly familiar with its importance in the three life periods mentioned, infancy, childhood and adolescence. I haven't performed any original research on the neuropsychology of their critical window, but I clinically have considered it in relevant patients.
Q. And can you describe for me at a high level what you understand by "critical window of neurodevelopment," your own understanding?
A. A critical window is a time in which the optimization of wellbeing, enrichment, support, and health, can pay off in dividends throughout that person's life.
Q. Or conversely, if they don't obtain the appropriate stimulation, to use the term from Dr. Baxendale's article, during that time period, that may have negative impact for life?

Page 100

A. So using my understanding of the critical window, if somebody is deprived of resources, such as food, attention, nurturing, if they endure traumatic experiences and then don't receive adequate support, if they have medical problems that go insufficiently addressed, then they are likely to experience the harms of that past the critical window.
And yet, if deprivation of that kind were to occur outside of the critical window, it is less likely that that deprivation would be as harmful in a long-term sense.
Q. Let me ask you to turn to page 3. And in this first column, down towards the bottom, there's a paragraph that begins "In summary." Do you see that?
A. I do.
Q. And what it says in the first sentence is that "In summary, puberty is characterized by both regressive and progressive stages of brain development. Unlike earlier developmental milestones, many of these processes are associated with pubertal stage, rather than chronological age." Do you see that language?
MS. LEVI: It's not the end of the

Page 101

sentence.
MR. BROOKS: You're right.
A. I see it.
Q. Close quote, period. You mentioned earlier that, I think, both pubertal hormones and age and social environment affect neurodevelopment, to your understanding. Am I correct?
A. I offered a little bit more context and descriptors there, I believe.
Q. And I wasn't trying to cut anything out, I was just taking us to a topic --
A. Certainly.
Q. -- and trying to be open. Is it consistent with your understanding, or do you disagree, or is it outside your expertise, that many of the neurodevelopmental stages associated with puberty are associated with pubertal stage, rather than chronological age?
A. Can I have the question back?
Q. Yes. Is it -- do you agree, disagree, or consider it to be outside your expertise, to say that many of the neurodevelopmental processes known to occur during puberty are associated with pubertal stage, rather than chronological age?
MS. LEVI: Object as to form.

Page 102

A. Your question, to me, as an adolescence medicine physician, feels overly simplistic and is vague. "Many," as a qualifier, is not specific enough so that I can grasp your question.
Q. Do you have any opinion as to whether important aspects of neurodevelopment in the adolescent brain are more strongly associated with pubertal stage than with chronological age?
A. I do not understand the utility in comparing chronological age with pubertal stage when there are other key determinants of development that are neither of those things, that shape one's pubertal experiences.
Q. Well, you're familiar with the concept of a multivariable function, are you not?
A. That is not a term that I'm familiar with. But we may have a shared understanding if you explain more.
Q. You studied a certain amount of math and statistics in your day?
A. I did. That's why I think it's significant that the term you're using is not one that I'm familiar with.
Q. A multivariable function is not a term you're familiar with?

Page 103

A. Could you describe what you mean by it, and then I can see if we have a shared understanding.
Q. I mean a function, the outcome of which depends on more than one variable.
A. When you say a function --
Q. If you don't understand what a function is, I'm not going to waste time on that. But let me ask you to turn to page -- to the second column, and it says on the top --
MS. LEVI: Is that on page 3?
MR. BROOKS: Yes.
Q. It says at the top, at the end of the first partial paragraph, "The male and female brain develops differently during adolescence both in terms of structural connectivity and developmental trajectory."
A. I don't see where -- oh, okay, I found it.
Q. In the first partial paragraph. Is that consistent -- statement consistent with your understanding as a doctor, or not?
A. I am loosely familiar with that. I have not done an in-depth search of the literature to ascertain what the current status of evidence is on that.
Q. Is it consistent with your general

Page 104

understanding that in recent years, data documenting differential development between male and female brains has increased?
A. I have no knowledge one way or the other.
Q. All right. Immediately below that is the sentence that reads "Completely reversible neuropsychological effects would not be predicted given our current understanding of the windows of opportunity model of neurodevelopment." Do you see that?
A. I do see that on the page.
Q. And is the assertion that completely -- is the assertion that given our current understanding of the windows of opportunity model of neurodevelopment, complete reversibility of impacts on that development from puberty blockers would not be predicted, consistent with your understanding, inconsistent with it, or outside your expertise?
MS. LEVI: Object as to form.
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
A. I'm so sorry, it's -- it feels, to me, a complex question and I need it back one more time.

Page 105

(THE REPORTER READ THE RECORD)
A. I have no opinion on that.
Q. Have you yourself made any effort to review published animal studies relating to the neurological impact of puberty blockers?
A. It's my understanding that the interpretation of animal studies is best done by people who have scientific expertise at an in-depth level in a particular area. I do not consider myself an expert in neuropsychology, in the endocrinologic processes of pausing puberty, and so I would not review an animal study in-depth to be able to determine whether or not its results might be generalizable to humans.
Q. Is it your view as a scientist that in general, animal studies may raise hypotheses relating to human impact, or are they -- strike that. This may not be achievable.
You would agree, would you not, that in general, what animal studies can do is raise hypotheses or questions with regard to impact of a therapy on humans, but are rarely directly generalizable to humans?
MS. LEVI: Object as to form.
A. So, again, I raise the initial caveats, that

Page 106

I myself do not review or consider myself capable of engaging with animal research. But I would also say that I cannot agree or disagree with your statement because it would depend on the specific study, the methodology used, the sample size, the duration of follow-up, and the clinical research question of interest.

Q. All right. Let me ask you to turn to page 7 in the Baxendale 2024 article. And there, under -- there's a heading that says "Central Precocious Puberty," a third of the way down. Do you see that?

A. Yes.

Q. And that begins, "In the only human study that established a baseline prior to treatment, Mul, et al examined," and it goes on.

Have you yourself reviewed the Mul, et al study that Baxendale refers to here?

A. This is a study entitled "Psychological Assessment Before and After Treatments of Early Puberty in Adopted Children." It was published in 2001. I have not read this study.

Q. Okay. Baxendale says that this is the only human study that establishes a baseline prior to treatment and then follows the administration of

Page 107

puberty blockade, albeit, as you've noted, for a different condition.

Are you aware, yourself aware, of any other human study that has established a baseline and then done posttreatment measurement of factors that Mul measures, such as IQ?

A. Later in this paper, Baxendale cites Arnoldson, et al, which is titled "Association Between Pretreatment IQ and Educational Achievement After Gender-Affirming Treatment, Including Pubertal Suppression, in Transgender Adolescents." I have read that study. I would need to be able to answer -- I'd need to review it. But I believe that the study does do a pre and posttreatment assessment of a similar type of measure --

Q. Okay.

A. -- in a more heterogenous population, not specifically youth with gender dysphoria. I have not done an in-depth analysis of the literature and it's not an area of my expertise. So I'm unsure if this sentence saying that this is the only study --

Q. All right.

A. -- is correct.

Page 108

Q. Looking back at page 7, Baxendale's summary of the findings of Mul -- and I recognize that's layers -- says that "Three years after treatment commenced, the group as a whole had experienced a loss in both performance IQ and full scale IQ, with a decline of seven points in the latter."

Now, let me ask you a hypothetical question. I don't have the Mul to put in front of you. You don't recall having read it. But if in fact a study found that girls treated with puberty blockade for central precocious puberty experienced a loss of 7 IQ points across three years, would you agree with me that that would be quite a concerning result?

MS. LEVI: Object as to form.

A. Again, I could not answer your question without reviewing the study to assessing the rigor of its methodologies, the sample size, the analysis.

Q. Well, if it were a fact that treatment with puberty blockade for central precocious puberty in girls resulted, over a span of years, in an average decline of IQ of 7 points, you would agree with me, would you not, that that would be quite a concerning result?

Page 109

A. That information would need to be contextualized with the -- with observations in a comparable group of individuals who did not receive treatment, if one were to -- let me just stop there.

Q. Well, and I'm not asking about ultimate conclusions. 7 points in an IQ scale is significant, you would agree with me, right?

A. I don't know if I know one way or the other to agree or disagree.

Q. And you just don't have any -- you're not able to offer any opinions, as you sit here today, as to whether a finding that girls treated with puberty blockade for central precocious puberty lost 7 IQ points over three years on average would concern you as a clinician?

A. There's so many other factors that would need to be considered before weighing in on that.

Q. Let's look at page 8. At the bottom of column two -- I'm sorry, at the bottom of column one, Baxendale begins a discussion of a single case study, Schneider, et al from 2017.

A. Mm-hmm.

Q. Are you familiar with the Schneider, et al case study?

Page 110

A. No.
Q. Baxendale's summary of the findings in that -- and just let me stop.
Would you agree as a general matter that a single case -- a case study of a single patient really can simply raise questions and concerns; it can't provide statistically sound information, correct?
A. If even, yes.
Q. If even, yes. The finding in this case study as summarized by Baxendale included that where treatment was initiated -- and I'm at the top of the second column -- where treatment was initiated with puberty blockades at age 11 years 11 months, by age 13 years and 3 months, a loss of 9 IQ points had occurred.
MS. LEVI: Just so I'm clear, are you summarizing from the bottom of the left-hand column, to the top of right-hand column?
MR. BROOKS: I am doing exactly that.
MS. LEVI: Okay, thank you.
Q. And specifically, the first -- the second full sentence beginning on the second column, treatment with GnRH was initiated as the start and finish time that I gave.

Page 111

MS. LEVI: On the left-hand column, I'm sorry, I just want to be clear. You're focusing on the Schneider study in the context of the three studies that are being discussed? I just want the record to be clear and I want to make sure I'm understanding.
MR. BROOKS: The language that I have focused on concerns only the Schneider study, which is only a case study of a single patient, --
MS. LEVI: Thank you.
MR. BROOKS: -- and reports a loss of 9 IQ points across the two plus years of treatment.
Q. And my question to you, similarly to the Mul study that we looked at, does that result cause you, as a clinician, concern about the administration of puberty blockers to adolescents?
A. Well, case studies are case studies. And it is not possible to control for confounders in a rigorous way to elucidate the relationship between the exposure and the outcome of interest.
In this single young person, it's unclear what other factors might have been going on in their life that may have impacted their intellectual quotient. They may or may not have been in school. They may or may not have had

Page 112

other illnesses. They may or may not have experienced a number of other factors that could influence IQ over time.
So as a clinician who is interested in the totality of the evidence, I would not draw any conclusions from this case report.
Q. So just to be clear, as a clinician, you are not willing to say that Mul's observation based on 25 girls of a decline of IQ of 7 points, or Schneider's observation based on a single patient of a decline of 9 IQ points, causes you concern?
A. I haven't reviewed either study. I can only take the summaries that are presented here as an indicator of what those studies might show. Regardless, a study of the impact of the medication on a population that is likely very different from the population that we are discussing and is of interest, in a single case report that does not control or assess for confounders, do not lead me in a -- down a path of being able to consider the import of either study in the question we're discussing.
Q. Let me ask you to turn to the next page, and there's this section headed "Discussion" at the end of the first full paragraph.

Page 113

Dr. Baxendale writes "There have been no human studies to date that have systematically explored the impact of these treatments" -- the subject being puberty blockers -- "on neuropsychological function with an adequate baseline and follow-up." Do you see that language?
A. Yes, I do.
Q. Do you agree with Dr. Baxendale that there have not yet been studies done on the impact of puberty blockers on neuropsychological function that did adequate baseline measures and follow-up?
A. Unfortunately, the language "adequate baseline and follow-up" is vague. And I am not able to agree or disagree without knowing what this author had in mind, and whether that might be clinically relevant to the subject matter at hand.
Q. Well, let me ask you, based on your own understanding of sound methodology, can you point me to any study that you believe has systemically explored the impact of puberty blockers on neuropsychological function with what you consider to be adequate baseline and follow-up measurements?
A. As we have discussed before, and as I have

Page 114

defined my area of expertise in this case, puberty-blocking medications and cognitive functioning is not something I have done an in-depth analysis on in preparing any reports. So I do not have an opinion on your question.
Q. On page 9, in the first column, Dr. Baxendale writes in the second paragraph of the discussion, "While there is some evidence that indicates pubertal suppression may impact cognitive function, there is no evidence to date to support the off cited assertion that the effects of puberty blockers are fully reversible." Do you see that?
A. Yes.
Q. And are you able to point me to any study today that you believe demonstrates that the effect of puberty blockers on adolescents as a treatment for gender dysphoria have only fully reversible effects on neurodevelopment?
A. In order to answer your question, I would have needed to do an in-depth analysis of the literature on that question, and I haven't done so.
Q. Are you able to identify any medical association that has taken any official position

Page 115

stating that puberty blockade is fully reversible with respect to impact on an adolescent's brain development?
A. Again, I could not answer your question either way because I have not done an in-depth analysis on this topic.
Q. Do you know whether any medical association has taken any position - has taken the position that cross-sex hormones administered to minors have no irreversible effect on brain development? This is not a topic that Baxendale speak to.
A. I know.
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
A. I have not seen that, to the best of my knowledge.
Q. Is it consistent with your understanding that every cell in an individual's brain contains either XY, male sex chromes, or XX, female sex chromosomes?
A. There are disorders of sexual development where people have different numbers of chromosomes. I do not know whether or not neurons contain chromosomal distribution patterns that are

Page 116

hallmarks of those disorders in people who have those disorders.
Q. Let me exclude those who suffer from genetic disorders of sexual development and ask whether, apart from that category of genetic defect, it's consistent with your understanding that every human individual's brain contains either XY male sex chromosomes in every cell and every neuron, or XX female sex chromosomes in every cell, every neuron?
MS. LEVI: Object as to form.
A. I'm not sure who or what neuroscientific researcher could speak with certainty to the chromosomal contents of every neuron in a person's brain. I certainly cannot.
Q. Is it outside your knowledge that every cell in my body, except somatic cells, contains XY chromosomes?
A. I believe it's outside the realm of knowledge of anyone to be able to decide that with certainty. There are millions of neurons in the human brain.
Q. Let me ask you to find your Expert Report.
MS. LEVI: Put these aside?
MR. BROOKS: Yes, for the moment.

Page 117

Q. And ask you to turn to page 15 of that report.
A. Okay.
Q. In the top partial paragraph, you have written "Physicians carefully counsel patients and their parents on the possibility of impairments in fertility should the patient continue on cross-sex hormones." You see that sentence?
A. Yes.
Q. And what is your basis for your understanding of what physicians do or don't carefully counsel patients about, given your earlier testimony that you yourself don't do that counseling?
A. I am a member of the Society of Adolescent Health and Medicine. It's the largest international organization of Adolescent Medicine specialists. I have professional relationships with many people who have obtained subspecialized training in this field. We communicate at conferences via Listserv. I have coauthored articles with other people in the field. And I have had discussions with these people who I consider to be colleagues from other institutions about their practices and about the nature of such

Page 118

conversations. And further, I have read sections in the clinical practice guidelines, both from the Endocrine Society and WPATH, that discuss this.
Q. You wrote that "Physicians carefully counsel patients about the possibility of impairments to fertility."
In your view, is it important that physicians carefully counsel patients about that topic?
A. Since it is an anticipated impact of some gender-affirming medical treatments, I do.
Q. And do you consider the potential loss of fertility to be an important impact on individuals?
A. I believe that all individuals should consider its relative importance to them.
Q. Do you have any knowledge as to whether undesired infertility in adults is recognized to be highly distressing to many individuals?
A. It's not something that I have any clinical experience in.
Q. Do you have any knowledge as to whether undesired infertility in adults is associated with mental health issues in the affected adults?
A. Again, not something that I have experience

Page 119

with professionally.
Q. Do you have an understanding as to whether sterilization without Informed Consent is internationally recognized to be a serious violation of human rights?
A. I am familiar with that.
Q. Do you believe that to be the case?
A. I do.
Q. And do you have an understanding that ethical principles preclude parents from giving consent to the sterilization of their children except to avoid imminent risk of death?
A. "Sterilization" is a broad term. If you could be more specific by what you mean about it, I could answer your question more specifically.
Q. In what way is "sterilization" a broad term? Is that unclear to you?
A. Yes, it is.
Q. Tell me in what respect it's broad.
A. In many respects.
Q. Well, by "sterilization," I mean loss of the ability to conceive or father children.
A. So you're describing infertility. Sterilization is something I understand not to be the same as infertility.

Page 120

Q. But you understand sterilization to perform an action on somebody that causes them to become infertile, correct?
A. I would understand that as an action that causes somebody to -- that renders somebody infertile with the intent of rendering them infertile.
Q. Do you recognize that ethical principles preclude parents from giving consent to procedures that will sterilize their children, except to avoid imminent risk of death?
MS. LEVI: Object as to form.
A. I am not familiar with that principle as you've described it. I know of cases in the literature that would potentially contradict that point you just raised.
Q. Would you yourself consider a risk that a certain treatment would reduce an individual's lifetime likelihood of being able to become a parent through natural conception, to be a serious adverse impact?
THE DEPONENT: Can I have the question back.
(THE REPORTER READ THE RECORD)
MS. LEVI: Object as to form.

Page 121

A. I don't understand that question.
Q. All right. Would you agree that a critical aspect of obtaining Informed Consent to any treatment for gender dysphoria must include ascertaining whether that adolescent has the psychological maturity to comprehend the role that having children may play in that individual's wholeness and happiness across the years of adult life?
A. That's a long question. I'd like to hear it again, please.
(THE REPORTER READ THE RECORD)
A. Could you rephrase your question?
Q. No, I don't think so. You're unable to answer it?
THE DEPONENT: Maybe I need to hear it again. It's very long. I apologize.
(THE REPORTER READ THE RECORD)
THE DEPONENT: Okay, thank you. I appreciate your patience.
A. So what you're describing, and based off of my professional experiences which I described when you first pulled up my Declaration, is a conversation that happens over time with mental health providers who are skilled in the area of

Page 122

gender diversity and patients and parents, as they consider treatments for gender-affirming care.
I bring this up to say that what you're describing is part of the decisionmaking process, to the best of my knowledge.
Q. And putting aside how that analysis is done, which I'll come back to, you would agree that in order to conclude that you had Informed Consent, you would want some confidence that that adolescent had the psychological maturity to comprehend the role that having children might play in that young person's wholeness and happiness across the years of adult life?
A. I would agree --
MS. LEVI: I'm going to object as to form, and then you can answer.
A. I would agree that any discussion along those lines should be informed by the best available evidence on the impact of those medications and fertility, and that patients understand all options for family building.
Q. That, however, is not what I asked. My question is, do you believe that in order to give Informed Consent, an adolescent, let's say to -- in order to give Informed Consent to let's say

Page 123

cross-sex hormones, the treating physician or team needs to conclude that that adolescent has the psychological maturity to comprehend the role that having children may play in that young person's wholeness and happiness across the years of adult life?
MS. LEVI: And I'm going to object as to form, and you can answer.
A. And perhaps to clarify my answer, the best available evidence on the likelihood of that medication impacting that outcome as you described it, should guide that conversation.
Q. You're unable to answer the question as to whether, as part of an Informed Consent process, it's important to ascertain that the young person has the psychological maturity to comprehend the role that having children might have in the wholeness and happiness of that individual's adult life?
MS. LEVI: Going to object as to form. I think you've asked her at least three times.
MR. BROOKS: Maybe if I ask four, I'll get an answer.
A. I don't have an different answer for you.
Q. That will play an interesting way at trial.

Page 124

Let me -- when it comes to how, let me take you back to your Georgia testimony, which was Exhibit 2. If you could find that, that would be helpful.
I won't take more time with that. Pardon me, put that aside.
MS. LEVI: It's one o'clock. I'm just checking.
MR. BROOKS: One o'clock is a good time. I'm going it move to a new document, so it's a good time to break for lunch.
MS. LEVI: That makes sense, okay.
(R E C E S S)
BY MR. BROOKS:
Q. Dr. McNamara, when it comes to evaluating whether a young person has the capacity to give Informed Consent to puberty blockers or cross-sex hormones, you yourself have never been responsible for making that decision, have you?
A. I have not.
Q. And indeed, that's a decision that, in your view, would be made by a mental health specialist?
A. It's a multidisciplinary team. It's not just one person.
Q. In the course of deciding whether an

Page 125

adolescent has the capacity to give informed consent, whether it's to puberty blockers or cross-sex hormones, have you yourself been an active participant in that decision process?
A. No, I have not.
Q. Okay. Do you consider yourself to have the expertise necessary to make that determination?
A. No, I do not.
MR. BROOKS: Let me mark as Exhibit 14, selected chapters from the WPATH SOC-8.
(DEFENDANT'S EXHIBIT 14 FOR IDENTIFICATION, Received and Marked.)
Q. And included in here, I believe, at least Chapter 6 -- I've got the Table of Contents in front of me, and turning to C, and I've got here the "Adolescent" Chapter 6, "Children" Chapter 7. And there may be other chapters in here, but I did not include the whole of that document.
Let me ask you in here to turn to page 57. And for some reason they're all labeled an S before the number, so S57.
Is the WPATH SOC-8 a document that you have studied with some care?
A. Yes, it is.
Q. You have page 57 in the second column, there

Page 126

is a paragraph that begins "Currently, there are only preliminary results." Do you see that paragraph?
A. (Affirmative nod.)
Q. The authors of SOC-8 write in that paragraph, "It is important not to make assumptions" -- let back up to give us a little context.
This is comment under Statement 6.10, which speaks to providing information about topics, including the potential loss of fertility to minor patients. Do you see that?
A. I do.
Q. I'm not reading the whole thing, but I'm trying to keep it at a high level.
And on the paragraph that I directed you to in the second column, it reads "Currently, there are only preliminary results from retrospective studies evaluating transgender adults and the decisions they made when they were young regarding the consequences of medical-affirming treatment on reproductive capacity.
SOC-8 goes on to say "It is important not to make assumptions about what future adult goals an adolescent may have."

Page 127

And they go on to note that "Research in childhood cancer survivors found participants who acknowledged missed opportunities for fertility preservation reported distress and regrets surrounding potential infertility."
And finally, the last sentence of that paragraph reads, "Furthermore, individuals with cancer who did not prioritize having biological children before treatment have reported changing their minds in survivorship."
Now, SOC-8 advises that it is "important not to make assumptions" that what an adolescent thinks today about their interest in having children necessarily reflects what they will feel in later years as an adult.
Is that your understanding of this paragraph?
A. That's a fair summary.
Q. Okay. And do you agree that it's important not to make that assumption?
A. I do.
Q. And the SOC-8 in this paragraph goes on to cite a collateral example of young people who faced cancer treatment decisions when they were young and thought they didn't care about

Page 128

preserving the ability to have biological children, and later changed their minds and regretted not being able to.
Is that also a fair summary of what they tell us there?
A. Yes, that is.
Q. As a clinician, does it surprise you to see evidence that what adolescents think about their desire to have children in the future may be quite different than what they actually desire when they're adults?
A. I am not surprised by that.
Q. Why is that?
A. Because it's not new information to me.
Q. What information did you have that led you to understand already, apart from what SOC-8 tells you, that what young people think about their future desire to have children may be quite different than their actual desire once they're adults?
A. So I took your initial question to not be explicitly pertinent to fertility and family planning.
Q. So your point was more generally that what adolescents think can be quite different from what

Page 129

they think or want when they have matured into adults?
A. My point is that it's highly individually dependent.
Q. Do you have any view as to whether, if it is individually dependent, it's possible to know whether a specific adolescent is likely to continue -- strike it. It's too complicated.
Do you know of any studies as to specifically whether individuals who have expressed a lack of interest in fertility preservation when making treatment choices for gender dysphoria as adolescents, change their minds on their desire to have children in their adult years?
A. That area of the literature is not something that I have gone in depth on in preparation of my report for this case.
Q. Is it something that you've discussed with peers and colleagues?
A. I don't believe so.
Q. Let me ask you a question.
MR. BROOKS: I'm going to ask a question based upon Dr. Ladinsky's deposition transcript in this case. I don't think it's technically

Page 130

essential that I mark it as an exhibit. Do you have a preference as to whether I do or not?
MS. LEVI: It would be easier to have it marked.
MR. BROOKS: Okay.
MS. LEVI: But is it just a volume issue that you're asking about?
MR. BROOKS: Yeah, it doesn't matter much today as it used to since things turned electronic. I will mark as Exhibit 15, deposition transcript of Morissa Ladinsky from April 12th of 2023.
(DEFENDANT'S EXHIBIT 15 FOR IDENTIFICATION, Received and Marked.)
A. May I set aside the Georgia transcript?
Q. Yes, I think you can.
I am guessing, Dr. McNamara, that you have not seen this transcript. I'm not going to ask you to look at much of it. Am I right, have you had a chance to read this before?
A. I have seen it.
Q. Oh, all right. Then let me ask you to turn to page 250.
A. All right.
Q. And for context, if you look at the previous

Page 131

pages, you will see that page 248 mentioned the Rafferty paper, Exhibit 25, which is the -- are you familiar with a paper authored by Dr. Rafferty on behalf of the American Academy of Pediatricians?
A. Yes.
Q. Okay. The questioning was against the background of that.
Page 250, I asked Dr. Ladinsky, page 250, line 4, "That is, you don't disagree with the statement that the effects of sustained puberty suppression on fertility is unknown?"
And Dr. Ladinsky answered "I agree with that statement." And went on to say "The question is, what does sustained mean." Do you see that testimony?
A. I do.
Q. Do you also agree with the statement that the effects of prolonged puberty suppression -- pardon me.
Do you also agree with the statement that the effects of sustained puberty suppression on fertility is unknown as of today?
A. I have a similar question as Dr. Ladinsky did, which would be the definition of the term

Page 132

"sustained" as it's intended here.
Q. Well, let's see if we can find that by reference to WPATH standards of care. Those standards of care advocate beginning puberty blockade for suitable young people at Tanner Stage 2; am I correct?
A. We would need to refer to the specific language for me to --
Q. You don't know the answer to that?
A. I don't have them memorized. So from memory, I could neither disagree or agree. But we could refer to them.
Q. We could, but it would take time. And Tanner Stage 2 occurs on average at what age among girls?
A. It's highly dependent on the individual, their nutritional status, race, ethnicity.
Q. Well, let's take --
A. 9 to 11.
Q. 9 to 11, fair enough. And according to the protocols that you're familiar with, for a child who's put on puberty blockers and then ultimately proceeds to cross-sex hormones, at what stage does one cease administering puberty blockers to that adolescent?

Page 133

A. I don't make those treatment decisions, and I'm not involved in that care at that level. I'm not sure I could answer your question.
Q. You just don't have any knowledge on that as you sit here today?
A. I'd like to give you an informed and accurate answer, and I don't have clinical experience to support a response. You're asking about a stage. I also don't know what you mean by "stage."
Q. Would you agree, disagree, or consider it outside your knowledge, that the effects of puberty suppression for three or more years on a child, on an adolescent, on fertility, is unknown?
A. It's outside the realm of my expertise, I have no source data on that.
Q. Let's find the Endocrine Society Guidelines for 2017, Exhibit 6. And you can put that aside and we will not return to it.
A. Okay.
Q. Can I ask you to find Exhibit 6, Endocrine Society Guidelines.
MS. LEVI: Yes.
Q. And there, let me ask you to turn to page 3880.

Page 134

A. Mm-hmm.
Q. And if you go to the first full paragraph, it begins "In girls." Do you see that paragraph?
A. I do.
Q. And it reads there that "Clinicians should inform adolescents that no data are available regarding either the time to spontaneous ovulation after cessation of puberty blockers, or the response to ovulation induction following prolonged gonadotropin suppression." Do you see that?
A. I do.
Q. And am I correct that gonadotropin suppression is also a reference to puberty blockade?
A. That's correct.
Q. Same thing as GnRH, functionally?
A. Gonadotropin releasing hormones stimulates the secretion of FSH and LH, and those two hormones are known as gonadotropins.
Q. You understand the reference to GnRH analogs to be referring to the same thing as gonadotropin suppression, correct?
A. GnRH analogs are used to achieve gonadotropin suppression.

Page 135

Q. Thank you. I don't know why they chose different terms there, I couldn't say.
Does it remain true, so far as you know, that there is no data available regarding the timing of resumption of ovulation after prolonged gonadotropin suppression?
A. I am, at this time, as I sit here today, unaware if there are any other studies on that topic that have been published in the seven or so years since these guidelines were issued.
Q. And in fact, you're not aware of any study that's been published up to the present that provides data on whether the population of natal females who are subjected to prolonged gonadotropin suppression will ever achieve healthy levels of fertility, are you?
A. It's not a topic that I have endeavored to do a thorough literature search on.
Q. Would you agree that the answer to that question is something that a reasonable clinician, a reasonable parent, and a reasonable health policy expert, would want to know and consider when deciding when or whether it's appropriate to administer puberty blockers to children as a treatment for gender dysphoria?

Page 136

A. I would say to that, that it's important to know whether or not there is sufficient evidence to answer that question, and to consider the presence or absence of that sufficient evidence, if it exists, in the context of other knowns, including risks and benefits of this treatment. In short, it's not the only thing that should be considered.
Q. Fair enough. Are you able to identify any medical organization that has asserted that the administration of puberty blockers as a treatment for gender dysphoria is fully reversible with respect to its impact on that child's fertility?
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
A. I don't have medical statements memorized. And off the top of my head, I'm unsure.
Q. And are you able to direct me towards any original research paper in a peer-reviewed journal that asserts a conclusion that the effects of puberty blockers administered as a treatment for gender dysphoria are fully reversible with respect to the impact on that child's future fertility?
A. I am aware of numerous studies showing

Page 137

resumption of menses, resumption of ovulation, resumption of spermatogenesis in individuals who receive puberty-blocking medications and then stop receiving them.
Q. Are you aware of a single study in which the authors state the conclusion that their data suggests that the effect of puberty blockers administered as a treatment for gender dysphoria adolescents is fully reversible with respect to the impact on that child's fertility?
A. Over what time course?
Q. Ever.
A. I'm not aware of any research study that has followed such individuals for decades at a time.
Q. Are you aware of any research of study that asserts, as a conclusion of the authors, that the effect of puberty blockers on -- administered as a treatment for gender dysphoria adolescents, is fully reversible with respect to the impact on that child's fertility?
A. I think I have answered your question.
Q. I think not.
MR. BROOKS: Let me ask you to read it back.
(THE REPORTER READ THE RECORD)

Page 138

A. I suppose the question that you're posing is a research question that's incredibly broad and could, as it's presented, span the duration of one's life. And I have not seen any such study.
Q. With respect to cross-sex hormones administered to adolescents, would you agree with me that it is widely accepted that sustained exposure to cross-sex hormones may permanently damage a young person's fertility?
MS. LEVI: Object as to form.
A. I'd need you to be more specific about the term "sustained," and also by what you mean with the phrase "permanent damage."
Q. Do you have any understanding about what age congenital cross-sex hormones are commenced for an adolescent as a treatment for gender dysphoria?
A. There is no specific chronologic age. It would be a possibility for an adolescent who meets diagnostic criteria, has a consenting parent or guardian, consents to a treatment, and has completed puberty.
Q. To your knowledge, based on your reading of the literature and discussion with colleagues, is there a kind of an average age at which cross-sex hormones are started for patients who have begun

Page 139

to be seen by a clinic from an early -- you know, from a younger age, just an average start time?
A. I couldn't commit to an average chronologic age. Highly dependent.
Q. Is it highly -- is it commonly begun by, for instance, age 14?
A. I could not answer that.
MR. BROOKS: Let me have tab 16 and ask the reporter to mark as Exhibit 16, a collection of Informed Consent forms in the University of Alabama Birmingham Pediatric Endocrinology Gender Health Team.
(DEFENDANT'S EXHIBIT 16 FOR IDENTIFICATION, Received and Marked.)
Q. Is this a document you have seen before?
A. No, I have never seen this.
Q. The only -- well, let me ask you to -- I will represent to you, based on Dr. Ladinsky's testimony, that this is -- or these are, I think there's a version here for -- this is a form that they use in their Informed Consent process before prescribing cross-sex hormones for minors.
Let me ask you to turn to page 3. And look at those numbers in the lower left-hand corner, as well as at the top, that match.

Page 140

Two-thirds of the way down, the last in the second series of bullets, says "I know that this treatment may, but is not assured to make me permanently unable to make a woman pregnant." Do you see that?
A. No.
Q. No? On page 3, there are three sets of bullet points.
A. Correct.
Q. The last of the second set --
A. I see it now, thank you.
Q. -- reads as I have said. And the major heading on the previous page here is "Effects of Feminizing Medications."
So these are bullets relevant to a natal male. University of Alabama Birmingham Gender Clinic is telling those natal male patients that hormonal cross-sex treatment may, but is not assured to make me permanently unable to make a woman pregnant. Do you see that?
A. I do.
Q. And do you consider that to be a deceptive claim about risk?
A. I do not.
Q. Why is that?

Page 141

A. The statement reads the caveat of "may, but is not assured to." But importantly, I have not done an in-depth analysis on the literature on fertility to be able to render an expert opinion on this statement as it appears in the Informed Consent forms.
Q. Let's turn to page 10, according to the numbers in the upper right-hand, in the upper -- the fax numbers, essentially -- the production numbers, I should say, across the top, since there's multiple paginations in the document. You see page 10 of 14 at the top?
A. I do.
Q. And here, we're in a heading that relates to masculinizing treatments. And it begins immediately to talk about testosterone.
Do you even understand that to be referring to cross-sex hormones that would be administered to a natal female; correct?
A. That's correct.
Q. And the University of Alabama Birmingham tells its patients two-thirds of the way down the page "I know that the effect of testosterone on fertility are unknown. I have been told that I may or may not be able to get pregnant even if I

Page 142

stop taking testosterone." Do you see that?
A. I do.
Q. And do you believe that in telling its natal female patients that testosterone may or may not make them permanently unable to get pregnant, the university of Alabama Birmingham is engaging in scare tactics?
A. This reads, to me, like a careful and measured way to inform a patient about knowns, unknowns, and potential risks.
Q. You don't consider it to be a deceptive description of the risk?
A. To agree with that, I would have to know the intent of the authors of this document. And I do not, so I can't offer an opinion on that either way.
Q. Do you believe it to be a false description of the risks?
A. Given my general knowledge of the literature, reading this with the potential of "may or may not" described, might still get pregnant, should know about birth control options, and informing a patient a pregnancy would preclude a receipt of testosterone therapy, I view this as a thoughtful, measured way to inform patients.

Page 143

Q. And in fact, you know it to be the case, do you not, that it's known that exposure to high levels of testosterone, for instance normal male ranges, damages ovaries?
MS. LEVI: Object as to form.
A. I don't know what is meant by "damage."
Q. Reduces their ability to produce viable eggs.
A. While in use, or while in one's system, either because it's endogenously produced or exogenously received, testosterone suppresses ovulation to varying degrees.
Q. And whether testosterone permanently damages the ability of ovaries -- pardon me, whether prolonged exposure to high levels of testosterone permanently damages the ability of ovaries to produce viable healthy eggs, that, you don't know?
A. That would not be an appropriate question for me because it's not my area of expertise.
Q. All right. Go to the SOC-8 tab again, Exhibit 14. And I'll ask you to turn to page 157.
A. See if I can find it.
Q. Towards the very bottom of the second column --
A. 157.

Page 144

Q. 157.
A. The very bottom of the second column, okay.
Q. There is a sentence, an inch or little more up, it begins "However, there have been." Do you see that?
A. Yes.
Q. Let me read that into the record.
In SOC-8 of 2022, WPATH states "There have been no prospective studies to date evaluating the effect of long-term hormone therapy on fertility, i.e. started in adolescence, or in those treated with puberty blockers in early puberty followed by testosterone therapy." Do you see that?
A. Mm-hmm.
Q. Do you think you understand that statement by WPATH?
A. Yes, I do.
Q. Am I correct that you also are not aware of any prospective studies up to the present evaluating the effect of either long-term hormone therapy, or puberty blockers on fertility?
A. Not with great certainty, no.
Q. If you look at the next page, column one, seven-eighths of the way down, inch and half from the bottom, is a sentence that begins

Page 145

"Spermatogenesis might resume." Do you see that?
A. Mm-hmm.
Q. And that sentence reads "Spermatogenesis might resume after discontinuation of prolonged treatment with antiandrogens and estrogens, but data are limited." Do you see that?
A. Yes.
Q. And so far as the data that's available today, 2024, am I correct that for you also, the most you can say is that viable spermatogenesis might resume after discontinuation of prolonged treatment with antiandrogens and estrogens, but we just don't know yet?
MS. LEVI: Object as to form.
A. My opinion on the matter is limited because I have not done an in-depth analysis of any literature published on this topic since the issuance of the 8th Edition of the standards of care in the fall of 2022.
Q. You don't have any basis as you sit here to disagree with that statement by WPATH?
A. It would require an in-depth analysis of the literature for me to agree or disagree that this sentence still holds. It's been about 18 months.
Q. Yes. Time flies when you're litigating.

Page 146

Correct me if I'm wrong, but I don't believe that your Expert Report or your Supplemental Report contain any assertions that cross-sex hormones don't permanently sterilize some percentage of those to whom they are administered as adolescents; am I correct?

MS. LEVI: Object as to form.

A. We would need to review it in depth to see if there's any particular line. And I believe I may have touched on --

Q. Well, then we won't do that, so let me just ask your opinion as sit here today. As you sit here today, are you able to offer an expert opinion that cross-sex hormones administered to adolescents do not permanently sterilize some percentage of those adolescents?

THE DEPONENT: Let me have the question back, please.

(THE REPORTER READ THE RECORD)

THE DEPONENT: One more time, please.

(THE REPORTER READ THE RECORD)

A. I am pausing because I'm aware of the fact that conception diagnoses can occur in individuals, including adolescents who are in receipt of cross-sex hormones.

Page 147

MR. BROOKS: Why don't you read the question back again.

(THE REPORTER READ THE RECORD)

A. I am -- sorry about that, excuse me. I am unable to opine either way. I haven't done the type of literature search that would be required to answer that question sufficiently.

Q. All right. In this Exhibit 6 that we looked at before, you and your coauthors state in column one of page 2920 -- actually, leaking over from the previous page, "Conception can occur in TGE people taking hormones." And just for the record, can you explain what TGE refers to?

A. Transgender and gender expansive.

Q. And by referring to conception, am I correct that in this particular sentence here, you're referring to natal females?

A. Not completely. I am referring to pregnancy of any kind. A transgender female receiving estrogen could have sex with and conceive a pregnancy with --

Q. Okay, all right.

A. -- someone capable of carrying a pregnancy.

Q. Am I correct that all examples of conception after a period of years of taking cross-sex

Page 148

hormones, in the case of natal females, involves females who have gone through full normal female puberty before beginning cross-sex hormone treatments?

A. I don't know enough to agree or disagree with your statement as you stated it.

Q. All right.

MR. BROOKS: Ask the reporter to mark as Exhibit 17, a paper, the first author Light, L-I-G-H-T, titled "Transgender Men Who Experience Pregnancy After Female to Male Gender Transition."

(DEFENDANT'S EXHIBIT 17 FOR IDENTIFICATION, Received and Marked.)

Q. And Dr. McNamara, am I correct that this is an article that you cited in your expert report?

A. I believe it IS. I would have to look at this, footnotes, just to make sure it's the right one.

Q. If you look at page 14 of 38 of your initial Expert Report, you can I think check that. Footnote 38, i think it's the second reference, if I found it correctly.

A. Great, thank you.

Q. And did you study this article with some care before citing it?

Page 149

A. Yes, I did.

Q. You state in the footnote that "The majority of transgender men" -- that is natal females -- "who had regular menses before starting testosterone therapy are reported to resume menses if testosterone is discontinued." Do you see that?

A. Give me just a second.

MS. LEVI: Are you saying that's in the Footnote 38?

MR. BROOKS: I think it's actually in the text. I misstated.

Q. And my question for you is, you're not offering an opinion, are you, that resumption of menses is itself sufficient evidence to conclude that those natal females have recovered healthy levels of fertility?

MS. LEVI: Object as to form.

A. It would depend on how one considers "healthy" to be meant.

Q. Well, you're not offering an expert opinion that the occurrence of menses demonstrates that that woman has the ability to conceive and bear a child to term, are you?

A. It is certainly an indicator of the

Page 150

possibility of one's ability to conceive a pregnancy.
Q. Necessary, but not sufficient, correct?
A. Correct.
Q. Now, the Light paper, as I understand it, and looking at page 1121, reports on an online survey of ultimately 41 natal females who claim to have self identified as male, and then experienced a pregnancy sometime within the last 10 years. Is that --
A. Where are you reading from?
Q. I am summarizing the "Materials and Methods." Some of that is column one, under "Materials and Methods."
A. Okay. You're summarizing it a little bit quickly for me. Would you mind if I take a moment to read this?
Q. Well, let me just give you some guideposts and then invite you to.
It refers, in the first column, under "Materials and Methods," to self identification as male, pregnancy within the last 10 years. And under "Results," after explaining certain thinning out, it says about an inch under the heading "Results," "41 percent remained for final

Page 151

analysis." Those are the things I was attempting to summarize.
A. Okay.
Q. And if I could direct your attention to Table 2, I will ask you about that specifically. Table 2 is on page 1123.
A. Okay.
Q. Again, to summarize, I'll represent -- and I know you have seen the article before, you cited it -- that some percentage of those who had self identified as male before being pregnant had never taken testosterone.
Table 2 gives us information about the 25 among those 41 who had reported that they had used testosterone before pregnancy. I'll represent that much.
This tells us that, in the first line of Table 2, that testosterone was first initiated at an average age of 25, and at age range between age 17 and 35. Do you understand that as I understand it?
A. I do.
Q. And you would agree that healthy females have completed maturation of their reproductive organs and are fully fertile by age 17?

Page 152

A. Certainly the vast majority are.
Q. And so all test subjects -- well, these aren't tests. All subjects reported in the Light article who said they had taken testosterone before becoming pregnancy -- before becoming pregnant, had gone through full reproductive maturation before disrupting their endogenous hormones with testosterone; correct?
A. I would need to look to see if the study confirmed that.
Q. Well, I will also represent to you that the study confirmed nothing. It's all self-report data, so make of that what you will.
MS. LEVI: Object as to form, if that was a question.
MR. BROOKS: It wasn't.
A. Then I don't have a response.
Q. Well, let me ask this question. If it is the case, that all these subjects as reported in Table 2 began taking testosterone no earlier than age 17, then it would also be the case that all of them had gone through full maturation of their reproductive organs before disrupting their endogenous hormones with testosterone; correct?
A. I would agree that the study is highly

Page 153

likely to capture individuals who have completed puberty before the initiation of testosterone blockade. Although I would need to review it again to determine testosterone -- I misspoke, I'm sorry.
Individuals who received testosterone. I think I said testosterone blockade. I would need to review it in depth to see if it mentioned any participants had any heterogeneity in that.
Q. So far as you recall, and so far as Table 2 tells us, no subject reported on in the Light paper began taking testosterone during her years of adolescence while sexual organs and fertility were still in the process of development; correct?
A. If I were to see a specific sentence where they said that, that would be helpful.
Q. Well, the sentence I would point you to is the one that says "Age when testosterone was initiated, range 17 to 35." Table 2.
A. I'm just looking at the inclusion and exclusion criteria.
I don't see anything that says whether or not participants completed puberty before starting testosterone. I agree with your general assumption. If I saw something that specifically

Page 154

said that in the paper, it would be helpful. But the paper may not include that.
Q. That is, you agree with my general assumption that healthy women have completed puberty by age 17?
A. About 95 percent have, that's a rough estimate.
Q. Is it not the case that for -- that a natal female who has not completed puberty by age 17 is considered to be in an unhealthy condition?
A. It's too general of a term. If somebody were an athlete, a very high performing athlete, they may not have menstruated yet. They may have a family history of late age of menarcheal onset.
Q. So far as you recall, this article, this study that you cited, does not include any subjects who reported having been subjected to puberty blockers to prevent undergoing normal female puberty; correct?
A. I'm scanning the study to see any mention of that, and I do not see it was. I will note that I don't see that included either way. I don't think we can say with certainty whether or not any of these 25 patients described in Table 2 have or have not received puberty-blocking medications.

Page 155

We might have to ask the authors.
Q. So far as you understand, based on this article, this article does not report any case of a woman who was exposed to puberty blockers to prevent ordinary female puberty, and then treated with testosterone, subsequently becoming pregnant?
A. I don't see anything in this study to say yes or no to that question.
Q. You understand this to have been data from some local clinic, or a nationwide survey?
A. We can refer to the "Materials and Methods."
Q. Yes, I think the first paragraph perhaps answers that, the last sentence of the first paragraph.
A. The recruiters participated through a web-based survey. Participation was not limited by geographic location.
Q. Might even be wider than nationwide.
A. It might be. I don't see any indication if that were -- oh, wait. There were six patients in Table 1 who reported residing outside the United States.
Q. Well, let me ask this: This web-based survey identified a total of 25 natal females who claimed to have experienced pregnancy and

Page 156

childbirth after undergoing testosterone treatment for at least some period of time. Is that your understanding?
A. That's a fair understanding, yes.
Q. And you will agree with me, will you not, that the results of that survey can tell us literally nothing about how many women who took testosterone for a period of their lives, later wished to but were unable to become pregnant?
MS. LEVI: Object as to form.
A. That is not the study question that this study sought to evaluate.
Q. So it gives you no information about that, correct?
A. It doesn't seem like that question was pertinent to what the authors sought to investigate.
Q. Well, in short, this article tells us nothing about how many women, if any, have been permanently sterilized as a result of taking testosterone as across-sex hormone in support of a transgender identity.
MS. LEVI: Object as to form.
A. This would not be the study to source to look for information pertinent to that question.

Page 157

Q. All right.
MR. BROOKS: Let's look at Schneider 2017. And let me ask the reporter to mark this as Exhibit 18.
(DEFENDANT'S EXHIBIT 18 FOR IDENTIFICATION, Received and Marked.)
Q. Is this also an article that you're familiar with and cited in your Expert Report?
A. Yes, it is.
Q. And you studied it with some care before citing it?
A. Yes, I did.
Q. Now, you cited it in your report, which feel free to reference, if you have that, again, text associated with Note 39, I believe. Let me find that.
Yes, text associated with Note 39. You wrote "Reduced spermatogenesis is common while patients remain on estrogen, but this occurs in varying degrees with some maintaining fertility even while on hormone therapy."
Have I read that language correctly?
A. You read the sentence on the page correctly.
Q. If you turn to page 877 in Schneider, et al, in the first column, the last paragraph above the

Page 158

heading "Sex Reassignment Surgery," begins "In children treated with GnRH agonists." You see that paragraph?
A. Not yet.
Oh, I see it, I'm sorry.
Q. Immediately above that heading. In that paragraph, they use a lot of big words and fancy terms. And then they conclude in the last sentence, "Hence, suppressing gonadotropins early in the development might hinder the preparation of the adult testis."
And did you believe you understood that sentence when you read this article before you cited it?
A. I'm not sure I can go back into that specific point in time.
Q. Do you think you understand it today?
A. I do understand it today.
Q. All right. What do you understand by "the preparation of the adult testis"?
A. They're describing who Rhesus monkeys in Plant, et al, 2005, postnatal and pubertal developments of a Rhesus monkey. So potentially, that refers to one Rhesus monkey.
In that study, the investigator noted that

Page 159

the density and shape of testicular cells was dependent on gonadotropins. And thus, a downstream-related phenomena would be the secretion of testosterone.
The authors of this study that we're reviewing now stated that suppressing gonadotropins early in development would hinder -- or excuse me, might hinder the preparation of the adult testis.
Q. And what do you mean, what do you understand "preparation of the adult testis" to refer to?
A. I would assume that it means something akin to maturation.
Q. And do you agree, disagree, or consider to be outside your expertise, to say that the evidence cited by the Schneider, et al authors suggests that suppressing the gonadotropins early in development, which is what puberty blockers do, might hinder the healthy formation of the adult testis?
A. Because I did not cite this paper outside the context of the relationship between estrogen and spermatogenesis, I do not have an opinion on your question.
Q. Let me ask you to turn to page 878. And in

Page 160

the first column, two inches from the bottom, in a paragraph that begins "Before starting CHT," the third sentence reads "The desire to reproduce and raise children is an inadequately studied field in transsexual persons." Do you see that language?
A. I do.
Q. And do you agree or disagree with these authors' conclusion that the desire to reproduce and raise children has been inadequately studied among transsexual persons?
A. I am loosely aware that there has been subsequent research in the seven years since the publication of this paper.
Q. And when it comes to the desire of transsexual individuals to reproduce and raise children, what research since this time do you have in mind?
A. As I said, I'm loosely aware and I did not do an in-depth analysis of that particular question in preparing my Expert Report for this case.
Q. As you sit here today, you don't recall any particular paper?
A. None off the top of my head.
Q. Do you know whether -- and let's, again, to

Page 161

be clear, the Schneider, et al cited in your Expert Report is a review article, not an original research article; correct?
A. Correct.
Q. So it says. And Schneider discusses and cites a number of different research articles; correct?
A. That is correct.
Q. In fact, he has listed on Table 1 on page 876, right?
A. There are 11 studies listed under Table 1 on that page.
Q. And so far as you recall, none of those studies involved males who were subject to puberty blockers to prevent full natural pubertal development prior to cross-sex hormones, correct?
A. Not that I'm aware of.
MR. BROOKS: Let me ask the reporter to mark as Exhibit 19, a paper from 2021, lead author de Nie, D -- well, you'll see it -- entitled "Histological Study on the Influence of Puberty Suppression and Hormonal Treatment on Developing Germ Cells in Transgender Women."
(DEFENDANT'S EXHIBIT 19 FOR IDENTIFICATION, Received and Marked.)

Page 162

Q. And Dr. McNamara, this is an article also that you cited in your Expert Report and studied before you cited, am I correct?
A. Yes, I'm just trying to find where -- oh, yes, here we are.
Q. 15, page 15, cited in Footnote 41, I believe.
Now, you wrote in your report that "In a cohort of patients treated with puberty blockers starting at the onset of pubertal development, Tanner Stages 2 and 3, and adding estrogen treatment starting at 16 years of age, histological examination of testicles showed normal-appearing, immature sperm-producing cells in the testes, suggesting those individuals had retained fertility potential."
Do you see that language in your report?
A. Yes.
Q. And you've described the subjects here, they began puberty blockers at Tanner Stages 2 or 3, and added cross-sex estrogen at age 16; correct?
I'm summarizing what you wrote in your report.
A. You're summarizing what I wrote in my report correctly.

Page 163

Q. And to your understanding, is that a fairly standard sequence in terms of when puberty blockers are begun for natal males and when estrogen cross-sex hormones are commenced?
A. Could I have the quote back?
Q. Yes. In your understanding, does that sequence that you've described there reflect a fairly standard timing of the commencement of puberty blockers and the timing of adding cross-sex estrogen treatment for natal males?
A. I'm pausing because I'm not aware of any study or national repository of data that describes typical ages of onset because it's so highly individualized.
Q. Just that --
A. All --
Q. I'm sorry?
A. It depends on when patients present to care, and what their goals of care are and how the assessments go.
Q. Does that sequence for that timing correspond with what you have heard described as the Dutch protocol?
A. The only difference is that the Dutch protocol has an age at which -- a chronological

Page 164

age at which they consider pubertal blockade. And this is based on pubertal stage.
Q. Well, at any rate, it's done by a bunch of Dutch people, but we'll move on from that.
A. All right.
Q. Just looking at the abstract study design, we have 214 male-to-female subjects, all of whom are adults at the time of the study; correct?
A. I see 214 transgender women included in the final study cohort.
Q. And the procedure here, all of these are individuals who have undergone surgery as adults, and the experimental process after castration, the testes are examined for the presence or absence of sperm cells at various stages of maturity; correct?
I think the first sentence of the study design, trying to summarize.
A. Of course, I appreciate it. I just need a moment.
Yes, that's correct.
Q. And if we turn to page 301, Figure 1, let me see if I can parse this out.
I'm sorry, not Figure 1.
301, column two, it reports that 4.7 percent

Page 165

of these natal males who had been subjected to puberty blockers followed by cross-sex hormones, 4.7 percent contained some apparently full mature sperm; correct?
A. The sentence reads, "In 10 transgender women (4.7 percent) some seminiferous tubules contained full spermatogenesis, all of whom had initiated medical treatment in Tanner Stage 4 or higher."
Q. And let me ask, do you understand full spermatogenesis to mean the development of, at least by visual inspection, fully mature sperm cells?
A. That's what I would take that to mean.
Q. Okay. So in 95 percent of the subjects who had been subjected to puberty blockers followed by cross-sex hormones, no mature sperm cells were found in the testicles, correct?
A. I'm not sure that's what this means.
Q. Why are you not sure that's what that means?
A. Unless I would see that stated specifically, I don't think I can agree with that statement.
Q. Among those in whom any mature sperm cells were found, all of those subjects had not begun puberty blockade until Tanner Stage 4 or higher, so the authors tell us; correct?

Page 166

A. Say that again.
Q. Among those subjects in whom any mature sperm cells were found in their testes, none of them had begun puberty blockade earlier than Tanner Stage 4; correct?
A. Just give me a second.
Q. I'll call your attention to lines that you read into the record where it says, column two, page 301, referring to those in whom some mature sperm cells were found, "all of whom had initiated medical treatment in Tanner Stage 4 or higher."
Do you recall that language?
A. This is just quite a detailed study. I'm wrapping my mind around it again.
Okay, your question back?
Q. In cases involved, that in those 4.7 percent of subjects in whom at least some mature sperm cells were found in their testes, none of those had commenced puberty blockade earlier than Tanner Stage 4, according to these authors.
A. Okay. Okay, I would agree with that.
Q. And having had more time to study the text and Table 2, would you agree with me also that in 95 percent of the subjects who had been subjected to puberty blockade and then cross-sex hormones,

Page 167

95 percent of those subjects had no mature sperm cells found in their testes?
A. Your question one more time, please.
Q. It's the case, is it not, that of the 4.7 percent of the subjects in whom at least some fertile sperm cells were found in their testes, none of them had commenced puberty blockers at a stage prior to Tanner Stage 4.
MS. LEVI: Object as to form.
Q. And my real question is, isn't that what you understand the authors to tell us on page 301 in column two, in the language you previously read into the record?
A. So no -- if we're -- so if we're referring to mature sperm cells, that is correct. No other -- no other participants showed histologic signs of mature sperm cells.
Q. And in fact, zero percent of the subjects who commenced puberty blockade at Tanner Stage 2 or 3, as recommended in the WPATH standards of care, showed signs of any mature sperm cells in their testes; correct?
A. Among the 29 participants in this study, none of them developed or had histological signs of spermatozoa, and some had histological signs of

Page 168

spermatocytes and spermatogonia.
Q. Now, according to these authors, is it your understanding that having only spermatocytes or spermatogonia is effective in fertility, at least on present technology?
I call your attention to page 306, first full sentence at the top of the first column.
A. Could you just give me just one second before I look there?
Q. Of course.
A. Okay, take me to where...
Q. Let me take you first to page 298. And there, still in the abstract, right at the very end of the abstract, it reads, "If maturation techniques like in vitro spermatogenesis become available in the future," and then it continues. Do you see that?
A. Yes.
Q. To your knowledge, at present, there are no technologies available to take spermatocytes or spermatogonia and progress them to viable sperm cells?
A. I don't know if, in the three years since the publication of this paper, that's been developed.

Page 169

Q. These authors say at the top of page 306, "Although these techniques are successful in animal models, they are still experimental and far from the clinical realm." Do you see that language?
A. Yes, cited in a 2020 paper by Pelzman, et al.
Q. And as you sit here today, you don't have any basis to disagree that technology to take spermatocytes or spermatogonia and achieve mature, viable sperm cells remains "from the clinical realm." Correct?
A. I don't know of anything, no.
Q. Okay. And the net result of that is that according to de Nie, et al, some 95 percent of their subjects who had been subjected to puberty blockers and cross-sex hormones were infertile at the time of their study; correct?
MS. LEVI: Object as to form.
A. I don't know that this study is able to comment on anything beyond the testicular histology that was sampled. That's highly dependent on the tissue that's analyzed.
I'm just trying to see if the authors say anything similar to what you said.

Page 170

Q. Let me ask my question differently. Earlier, you agreed with me that according to the numbers in this paper, 95 percent of their subjects had no mature sperm cells detected in their study; correct?
A. Say that one more time.
Q. You earlier agreed with me, had you not, that according to the data in this paper, 95 percent of their test subjects -- in 95 percent of their test subjects, no mature sperm cells were detected according to the analysis that they did?
A. In Table 2, 4.7 percent of all subjects had spermatozoa, which is the most mature form of sperm. The remaining subjects -- in the remaining subjects, excuse me, the investigators isolated sperm cells of varying degrees of maturation. Or among 7, none at all.
Q. And you would agree with me, would you not, that only mature spermatozoa cells are able to fertilize an egg?
A. At that very moment in time.
Q. Correct. And so far as these authors study reports, in 95 percent of their subjects who had been subjected to puberty blockers followed by cross-sex hormones, they did not detect evidence

Page 171

of mature sperm cells necessary for fertility in those subjects?
A. At that point in time, yes.
Q. And let me ask you to turn to page 301.
In column two, in the last paragraph, the authors state "Hyalinization of seminiferous tubules was observed." Do you know what hyalinization is?
A. I believe it's describing some degree of histologic maturation of seminiferous tubules, which is where sperm cells are produced.
Q. Is it your understanding that hyalinization describes a level of maturation, or some level of degeneration and blockage?
A. Off the top of my head, I'd have to look it up.
Q. Fair enough. At the end of the -- that paragraph, these authors write "The complete absence of a lumen was most comment in those who initiated treatment in Tanner Stage 2."
Let me similarly ask whether you understand what the authors are referring to when they mention "absence of a lumen"?
MS. LEVI: I just want to say on the record, that didn't complete the sentence.

Page 172

MR. BROOKS: You are right.
MS. LEVI: I'm sure that wasn't intentional, but I didn't want to have the record --
MR. BROOKS: It was an error not in my favor, so let me correct it.
Q. The sentence reads "The complete absence of a lumen was most common in those who initiated treatment in Tanner Stage 2 or 3."
And Dr. McNamara, if all you know about that is what you would read in this article, then you tell me that, and I will simply move on.
A. Yeah, I'm just trying to avail myself to the terminology again.
Q. We can just move on.
A. Sure.
Q. Let me ask you to turn to --
THE DEPONENT: Can I get a break?
MS. LEVI: I'm sorry, are you done with this article?
MR. BROOKS: I've got probably three more minutes on this document, if that's all right. If it's not all right, we can take a break.
THE DEPONENT: That's all right.

Page 173

Q. Let me ask you to turn to 305, column two, where, at the very first sentence at the top, these authors from Vrije University in this paper that you cited from 2022, say "It is unknown if spermatogenesis can recover in if gender-affirming hormone therapy is stopped and how much time is needed for this purpose." Do you see that?
A. Yes.
Q. Do you have any basis to disagree with the authors of this paper that it's unknown if spermatogenesis can recover if gender-affirming hormone therapy is stopped?
A. As a general matter, amongst population-wide samples, I have no reason to disagree.
Q. If you look a little farther down in that column, a little below halfway is the sentence that begins "Another study, however, reported." That's the end of the line. Tell me when you found that.
A. I'm not seeing it.
Q. Pointing on my page just to help you locate it.
A. I got it here.
Q. Of course, I cheated and highlighted.
A. That was helpful, though.

Page 174

Q. It reads "Another study, however, reported that 48 percent of transgender adolescents acknowledged that their desires regarding parenthood might change over time," citing a Strang, et al paper.

Are you familiar with the Strange, et al paper?

A. I might have read it at some point. I don't recall off the top of my head.

Q. Do you, based on your own reading or experience, have any basis to disagree with the conclusion of Strang, et al that 48 percent of transgender adolescents stated that their desires regarding parenthood might change in the future?

A. Well, that statistic describes the population that these authors studied. It doesn't necessarily apply to all transgender adolescents.

Q. And are you aware of some study that reaches a different conclusion, based on a different population?

A. I am aware that a finding like this in one study should not be generalized as it is described to all adolescents.

Q. And finally, let me ask you to turn to page 306. And there, in the top of the first column,

Page 175

an inch down, is the sentence that begins "Furthermore." Tell me when you've found that.

A. Help me out.

Q. (Indicating.)

A. Got you. Thank you.

Q. It reads "Furthermore, future research should focus on how GHAT influences the quality of germ cells and the safety of using cells harvested from orchiectomy specimens for reproductive techniques."

When you read this article, do you believe that you understood what the authors were getting at in that sentence?

A. Yes, I believe I did.

Q. Do you understand the authors to be raising a concern that even apparently viable sperm cells that had been subjected to GAHT might be damaged in some way that would result, for instance, in birth defects?

A. I'm not interpreting any concern from this statement. I am interpreting that the authors are highlighting an area where future research is needed.

Q. By "quality of the germ cells," did you understand them to be speaking to -- I should say

Page 176

"by quality of germ cells and safety of using them," did you understand the authors to be referring perhaps, among other things, to the possibility of genetic defects, birth defects?

A. I'm not reading that in this sentence.

Q. What do you understand that to be referring to when they refer to safety?

A. I couldn't infer anything else from the words on the page.

MR. BROOKS: All right, let's take a break.

THE DEPONENT: Sounds good, thank you.

(R E C E S S)

BY MR. BROOKS:

Q. Let me ask you to find once again the Endocrine Society Guidelines, Exhibit 6. And I will ask you to turn to page 3895, and I want to take you down to the very bottom of the second column where it reads "Disclaimer." Do you see that little header?

A. I do.

Q. There, the Endocrine Society states "The guidelines should not be considered inclusive of all proper approaches or methods, or exclusive of others. The guidelines cannot guarantee any

Page 177

specific ought come, nor do they establish a standard of care."

Dr. McNamara, were you aware that the Endocrine Society has explicitly denied that its guidelines do constitute or could be considered a standard of care?

A. I am not sure how they mean "standard of care," what meaning that has for this organization. It's a -- more of a subjective term that I think different individuals and organizations can have difference meanings of.

Q. So in your understanding, "standard of care" is not a well-defined term?

A. Let me -- for me, personally, as an individual reading this, I do not know what the Endocrine Society's intended meaning of "standard of care" in this particular context might be.

Q. In the first sentence I read, at least they're telling us that other approaches to treating gender dysphoria may also be appropriate; correct?

A. Your question again, please.

Q. The sentence that reads "The guidelines should not be considered inclusive of all proper approaches or methods, or exclusive of others."

Page 178

Do you see that language?
A. I do.
Q. And at the very least, the Endocrine Society there is telling us that there may be other appropriate approaches to treating gender dysphoria, correct?
A. They are saying that these guidelines should not be considered inclusive of all proper approaches -- they are saying that these guidelines should not be considered inclusive of all proper approaches or methods, or exclusive of others.
Q. And what that means to you as the reader is that there might be other proper approaches to treating gender dysphoria, correct?
MS. LEVI: Object as to form.
A. I don't draw that conclusion from this sentence.
Q. Interesting. The Endocrine Society tells us that their guidelines do not establish standard of care -- strike that.
Can you identify for me any national health authority, any country, that has endorsed the WPATH as the standard of care, either 7 or 8, as the standard of care for their health service?

Page 179

A. I don't understand, meaning the term "health service."
Q. Well, you well understand that in many countries, there is a unified National Health Service of some sort, correct?
A. In countries outside the United States, perhaps you can provide some examples so I know what you're talking about.
Q. Europe. You're well aware in European countries, there is a National Health Service, government-funded, unlike anything we have in this country; correct?
A. Correct.
Q. And are you aware of any National Health Service anywhere in the world that has endorsed the WPATH standard of care as the practiced standard of care in their nation for treatment of gender dysphoria?
A. I am not aware of whether any country's nationalized health system has endorsed WPATH's standards of care in any version, or any other guidelines for any other medical organization.
Q. And likewise, you're not aware of whether any National Health Service has endorsed the Endocrine Society Guidelines?

Page 180

A. Similarly, my answer to that question is the same.
Q. If you would find your report, let me ask you to turn to page 5 of your report.
At the top of page 5, you state "Organizations such as the American Academy of Pediatrics, the American Psychological Association, and the American Academy of Child and Adolescent Psychiatry have endorsed these standards of care." And I believe you're referring to, in that paragraph, to WPATH's standard of care and Endocrine Society Guidelines. Am I understanding you correctly?
A. That's correct.
Q. And can you point to any document in which the American Medical Association has endorsed WPATH's standard of care?
A. I did not list the American Medical Association in this paragraph.
Q. Can you point me to any document with which the American Academy of Pediatrics has endorsed the WPATH's standards of care, whether Version seven or 8. There's no cites, so I'm asking.
A. In Dr. Rafferty's article written with the sexual and gender minority group within the AAP,

Page 181

they cite both guidelines throughout.
Q. Is it your recollection that Dr. Rafferty's paper published by the American Academy of Pediatrics anywhere endorses the WPATH standards of care?
A. If you'd like us to refer to that paper, I can point to specific areas where they cite that paper.
Q. Is it the case, Dr. McNamara, that every time you cite a paper, you endorse everything in it?
A. I don't really try to cite things that I write completely that affirm or support key points that I'm trying to make. I'll leave it there.
Q. Well, you state that these organizations have endorsed these standards of care. And my question for you is for any one of these three organizations, can you point me to any document in which that organization states "We endorse, we approve, these standard of care"?
A. While you and I might have slightly different understandings of the term "endorse," for a medical organization to cite guidelines in a position statement, that is certainly an affirmative position that I, as the author of this

Page 182

expert testimony, drew an opinion on and opined that it constituted an endorsement, as I understand an endorsement to be.

Q. Did you make any effort to research whether any of those organizations had adopted -- had any formal endorsement of either the WPATH SOC-8 or the Endocrine Society Guidelines before making that statement in your report?

A. As I discussed, sourcing statements made by these organizations where those guidelines are cited and discussed as expert and authoritative, is not something that a medical organization would do lightly.

Q. And so far as you know, it's not something they've ever done?

A. You were previously referring to nationalized health care systems when you were talking about organizations. And now we've switched to talking about medical organizations, which are very different.

MR. BROOKS: Let me hear back the witness's previous answer, not this one, about the previous answer.

(THE REPORTER READ THE RECORD)

Q. What is it you were saying that a medical

Page 183

organization would not do lightly?

A. As she just read, a medical organization would not favorably cite guidelines without -- let me say that differently. Apologies.

A medical organization would not cite and describe guidelines lightly.

Q. Let me ask you a different question. What knowledge do you have as to whether gender clinics in Alabama, prior to the enactment of the law at issue in this litigation, consistently followed WPATH SOC-7 guidelines or the Endocrine Society Guidelines?

A. So we've already discussed in my testimony earlier today that I have no in-depth knowledge of any of the practices in the University of Alabama at Birmingham gender services.

Q. And what knowledge do you have as to whether gender clinics across the US consistently follow the WPATH standard of care or the Endocrine Society Guidelines?

A. Of my colleagues who I communicate with on these matters, who practice in gender clinics throughout the country, they report utilizing the WPATH's standards of care and the Endocrine Society Clinical Practice Guidelines.

Page 184

MR. BROOKS: Let me mark as Exhibit 20, an article from the Washington Post, coauthored by Dr. Laura Edwards-Leeper and Dr. Erica Anderson entitled "The Mental Health Establishment is Failing Trans Kids."

(DEFENDANT'S EXHIBIT 20 FOR IDENTIFICATION Received and Marked.)

Q. Do you personally know either Dr. Edwards-Leeper or Dr. Anderson?

A. No.

Q. Are you aware that Dr. Edwards-Leeper is one of the named authors of the SOC-8?

A. I don't have it in front of me, so I can't verify that.

Q. Well, let's find it. Exhibit 14, there's a lot of names, but I have --

A. I agree with you. I found it myself.

Q. Okay, good. And do you know whether Dr. Edwards-Leeper has held any, other than being one of the coauthors of the SOC-8 guidelines, do you know whether she has held any executive position in WPATH?

A. I don't know.

Q. Do you have any knowledge as to what level of professional experience in treating minors with

Page 185

gender dysphoria Dr. Edwards-Leeper has?

A. I believe she has professional experience. I'm not sure how much and to what extent.

Q. And are you familiar with the reputation of Dr. Laura Anderson?

A. I believe her name is Erica Anderson.

Q. Yes, pardon me. Are you familiar with the reputation of Dr. Erica Anderson?

A. Not really.

Q. Are you aware that Dr. Anderson was president of the United States USPATH, the United States Professional Association For Transgender Health?

A. I am now.

Q. Not really. You shouldn't take my word.

Let me ask you to turn to the first text page, the second page of this exhibit. Let me ask you whether you have read this article before today?

A. No, I haven't.

Q. Do you recall discussion about it about the time it came out amongst your colleagues and peers?

A. I don't. This is November 2021.

Q. Right. At the very bottom of -- the

Page 186

subtitle here, of the article, is "Gender Exploratory Therapy As a Key Step. Why Aren't Therapists Providing It?"

Now, let me take you to the text at the very bottom of the page, the first text page. And there, Dr. Edwards-Leeper, coauthor of SOC-8, says "A study of 10 pediatric gender clinics there found that half do not require psychological assessment before initiating puberty blockers or hormones." Do you see that?

A. No, not yet.

Q. Very last sentence on the page.

A. Oh, I see. Starts with a different -- "Canada, too," yes. I see the sentence now.

Q. And above that, three lines above that, these authors state that many providers are being spurred into sloppy, dangerous care. Do you see that?

A. I see that phrase.

Q. Do you share Dr. Edwards-Leeper's concern that many providers around the country are providing sloppy, dangerous care to children suffering from gender dysphoria?

A. I take this phrase to be from both authors, not just one.

Page 187

Q. Correct. But if I say both their names all the time, it will take too much time.

A. Hmm.

Q. They're coauthors.

A. Correct. Your question, then?

Q. My question is do you share these authors' concern that many providers are engaging in "sloppy, dangerous care" for minors suffering from gender dysphoria?

A. I only have knowledge of the opposite; careful, measured, thoughtful care.

Q. Do you believe that your knowledge of practice around the country is sufficient for you to reject as mistaken these authors' belief that many providers are engaging in sloppy, dangerous care?

A. I don't know what these authors are basing that on. And that is knowledge that I would need in order to answer your question.

Q. Referring back to the study was actually a Canadian sample. Do you have any knowledge as to what proportion of gender clinics in the United States require psychological assessment before initiating puberty blockers or hormones?

A. I don't know whether or not there's data on

Page 188

that.

Q. And it is consistent with your understanding, is it not, that the WPATH standards of care require a psychological assessment before puberty blockers or hormones are initiated?

MS. LEVI: Object as to form.

A. I would need to refer to the specific section of the Adolescent chapter to refresh myself on the language before I could answer your question.

Q. You practice in this area and you can't tell me today that whether or not the WPATH standards of care require psychological evaluation before initiating puberty blockers or cross-sex hormones?

A. I want to answer your question as accurately and thoroughly as possible. And I would want to look at the language with you today before I answered the question. I'd be happy to do so if you wanted to find out.

Q. I'm not going to spend my time that way.

Let me ask you to turn to the second text page. If you look down to the first full paragraph, begins with a big A.

These authors state "The pendulum has swung from a vile fear and skepticism around ever

Page 189

treating adolescents medically to what must be described in some quarters as an overreaction. Now the treatment pushed by activists, recommended by some providers and taught in many training workshops, is to affirm without question." Do you see that language?

A. I do.

Q. Do you share these authors' concern that some providers are affirming without question?

A. I'm not sure I understand what that means, as they're wording it.

Q. Let me ask you to turn to the next text page. And there, in the top partial paragraph, these authors, beginning partway through line three, state "Frequently, those community clinicians" -- that is, those who refer children to specialty clinics -- "just like the parents, assume that a more comprehensive assessment will occur in the gender specialty clinic. But in our experience, and based on what our colleagues share, this is rarely the case. Most clinics appear to assume that referral means a mental health provider in the community has diagnosed gender dysphoria and therefore -- and thereby given the green light for medical intervention."

Do you see that language?
A. I do.
Q. Do you share these authors' concern that in many cases within the US, neither the primary care physician, nor the gender clinic, is performing a thorough diagnosis before medical intervention?
MS. LEVI: Object as to form.
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
A. My experiences, as I have described them, don't include anything along these lines. And my familiarity with the literature shows that youth often experience long delays from their first contact with the gender clinic until receipt of medication.
Q. Is it possible that your position associated with Yale has you less in touch with the actual practice across the nation than these authors, one of whom is a coauthor of SOC-8?
A. If anything, my position here at Yale as the only board certified Adolescent Medicine physician has driven me to connect with people who I consider to be colleagues across the country and from other institutions. Being the sole board

certified provider of your institution means that you often look outside of it for professional community.
Q. A little farther down in this third page of text is a paragraph that begins "Some providers may move quickly." You see that paragraph?
A. I do.
Q. And the second sentence reads, in part, "Some assume that a person with gender dysphoria who declares they are transgender is transgender, and needs medical interventions immediately." Do you see that?
A. I do see that.
Q. And do you share these authors' belief that some young people who declare they're transgender may not need medical intervention immediately?
MS. LEVI: Object as to form.
A. It seems like they're referencing the subsequent study here to back up that point. I would probably need to look at that to get more context into what they're saying here.
Q. Ask you to turn to the next page.
A. Okay.
Q. There, these authors state "Longer term longitudinal studies are needed to better

understand the role of medical interventions on lifetime psychological health, particularly with the newer subset of adolescents presenting with no childhood dysphoria and significant mental health concerns."
Is it consistent with your knowledge and your expert opinion that in recent years, a newer su set of patients are presenting at gender clinics who experienced no childhood gender dysphoria and suffer significant other mental health concerns?
A. The demographics of patients being referred to gender clinics are different in some ways than they were in years past. I would not characterize that as meaning that they are a separate subset.
Q. So as to that characterization, you disagree with Dr. Edwards-Leeper?
A. I don't have enough information as it's written here to understand what information that individual is basing this statement on.
Q. In the next paragraph, the third line, these authors state that "Without proper assessment, many youths are being rushed toward the medical model, and we don't know if they will be liberated or restrained by it."

Let me ask whether you share these authors' concern that today, many youths are being rushed towards a medical response to gender dysphoria.
A. Again, I'm not sure what data they're basing that claim on.
Q. Yes, but my question is whether you share their concern.
A. I base all of my opinions in this case on evidence and data. And I don't have anything to go with here. So I can neither agree or disagree with this statement as it's written.
Q. The very first, the very top of the page, I asked you about the back half of the sentence, but let me ask you about the first half.
"Longer term longitudinal studies are needed to better understand the role of medical interventions on lifetime psychological health."
You have spent a fair amount of time studying the literature. Let me ask whether you agree with these authors that we need longer term studies to understand the role of medical interventions in lifetime psychological health of young people who are presented in clinics?
A. Longer term, larger, multiinstitutional studies are always a benefit in the field of

Page 194

clinical research and can always guide medical decisionmaking in patient care in a better way. I consider this first half of this sentence to be something that I agree with on that basis.

Q. And towards the end of the -- well, the paragraph begins "The pressure by activist medical and mental health providers, along with some national LGBT organizations to silence the voices of detransitioners and sabotage the discussion around what is occurring in the field is unconscionable."

Let me ask, have you yourself, as you pay attention to the literature, or the media, or discussions within academia, do you have any view as to whether there is or is not pressure by activists and some LGBT organizations to silence the voices of detransitioners?

A. I have not noted that.

Q. Let me ask you to take the WPATH standards of care, Exhibit 14, out. And let me ask you to turn to page 46.

Is it your testimony that -- let me put it this way: Is it your belief that the WPATH SOC-8 recommendations with regard to care of adolescents suffering from gender dysphoria are based on

Page 195

systematic reviews of the available evidence?

A. Are you referring to a specific chapter?

Q. Well, I asked about adolescents. And there is a chapter that pertains specifically to adolescents.

A. That might have been what I didn't catch in your last question. Can I have the question back so I make sure I understand completely?

(THE REPORTER READ THE RECORD)

THE DEPONENT: Thank you.

A. This particular chapter, as the authors describe, was not based on a systematic review. It was based on a review of the evidence, which the authors describe a bit further.

Q. So far as you're aware, WPATH has not claimed that its recommendations regarding medical transition of adolescents or children are based on any systematic review, correct?

A. I have not seen an instance of that organization saying that regarding the care of adolescents.

Q. Or children?

A. I have not looked at -- excuse me, I haven't looked at the Children chapter.

Q. I think you and I are looking at the same

Page 196

language in column one. About two inches down, the authors of SOC-8 tell us that "There are few outcome studies that follow youth into adulthood." Do you see that language?

A. I do.

Q. And is that consistent with your understanding of what is out there in the literature?

A. Yes, it is.

Q. So when it comes adolescents being treated in gender clinics, we simply don't have studies that tell us about either their mental or their physical health of such patients by the time they are, for instance, age 30?

A. I have not seen that study, to the best of my knowledge.

Q. Or age 40, or age 50?

A. There may be studies that have included participants of some of those ages who did receive some type of care as an adolescent. Off the top of my head, I can't recall one.

Q. The WPATH authors tell us in language, that because the number of studies is low and there are few outcome studies that follow youth into adulthood, "Therefore, a systematic review

Page 197

regarding outcomes of treatments in adolescents is not possible." Do you see that?

A. Yes.

Q. And based on your understanding of what is meant today by evidence-based medicine, does it make sense and is it consistent with the way terminology is used in evidence-based medicine to say that a systematic review regarding outcomes in adolescents is not possible?

A. It is this organization's prerogative to make that determination about their own standard of care. I don't have an opinion on that sentence further from that.

Q. Do you believe the standard of care generated by WPATH to have been generated in compliance with accepted principles of evidence-based medicine?

A. I generally agree with that.

Q. And yet you think it's their prerogative to define a standard when a systematic view can or cannot be performed?

A. As subject matter experts on this particular area, I believe that they're well positioned to make that determination.

MR. BROOKS: I ask the reporter to mark

Page 198

as Exhibit 21, an article from the British Journal of Medicine, 2023, entitled "Gender Dysphoria in Young People is Rising and So is Professional Disagreement."

(DEFENDANT'S EXHIBIT 21 FOR IDENTIFICATION Received and Marked.)

Q. And Dr. McNamara, I asked you earlier about the reputation of the New England Journal of Medicine. Do you have any understanding of the international reputation of the British Medical Journal?

A. It is certainly a reputable journal. I am not aware of whether or not this document was printed in a peer-reviewed journal or if it was simply included on their website.

Q. Well, it doesn't purport to be original research, and it doesn't purport to be a review article. It is titled -- it is by Jennifer Block, who is designated as an investigations reporter. But is it consistent with your understanding that the British Medical Journal is perceived as one of the premiere medical journals in the world?

A. It's certainly a high impact, reputable journal. I wouldn't qualify it further than that.

Q. Well, if somebody testified that it was

Page 199

viewed as one of the world's premiere medical journals, would you disagree with that?

A. I think I have given you my opinion on what this journal means to me as a physician. I don't have anything else to say about it.

Q. Let me ask you to turn to the fifth page. The numbers are small type down at the lower right-hand corner. And the third full paragraph begins, "For minors." Do you see that?

A. I do.

Q. And there, it reads "For minors, WPATH contends that the evidence is so limited that a systematic review regarding outcomes of treatment in adolescents is not possible. But Guyatt counters" -- that's G-U-Y-A-T-T -- "that systematic reviews are always possible, even if few or no studies meet the eligibility criteria. If an entity has made a recommendation without one, he says, they'd be violating standards of trustworthy guidelines." Do you see that?

A. Mm-hmm.

Q. Do you agree with Dr. Guyatt, who we've mentioned earlier, the guidelines that are not based on a systematic review of the relevant literature do not comply with standards for

Page 200

trustworthy guidelines?

A. What I'm reading on the page is a little different from how you're presenting it to me as a summary. It's a truncated quote. And I'm not sure in the context with which it's being attributed to this individual, it doesn't appear to be citing any peer-reviewed research that this individual has produced.

Q. Do you believe that you or Dr. Guyatt are better informed about the definition and principles of evidence-based medicine?

A. I don't understand the question.

MR. BROOKS: Read it back, please.

(THE REPORTER READ THE RECORD)

A. I'm not sure I have any evidence upon which to compare my knowledge to somebody who I -- I have never met, and I think I'll leave it there.

Q. Is it outside your knowledge that Dr. Guyatt is considered one of the founders of the field of evidence-based medicine?

A. I am unsure who specifically considers Dr. Guyatt to be considered a founder of evidence-based medicine. I would need to understand that further.

Q. And o you know or not know whether Dr.

Page 201

Guyatt has written an entire textbook that's widely used on evidence-based medicine?

A. I know that he's written textbooks on evidence-based medicine. I have read several textbooks on evidence-based medicine. And in my training on evidence-based medicine, I received education from several leaders in clinical research. And Public Health resourced a wide variety of educational documents on the topic. And they were not all written by the same person.

Q. At the very last paragraph, let me just ask, there's a mention also of a Dr. Helfand, H-E-L-F-A-N-D, who I'll represent to you that he's a professor of Medicine and Medical Informatics with the Oregon Health and Science University.

Let me just ask, have you heard his name, do you know anything about his reputation?

A. I have never heard of him.

Q. Okay. I won't rest anything oh that. And the final paragraph of this article reads -- the final paragraph on page 5, not the final paragraph, I apologize.

A. I see.

Q. "Calling a treatment recommendation evidence-based should mean that a treatment or

Page 202

guideline has not just been systematically studied, says Helfand, but that there was also a finding of high quality evidence supporting its use.

Now, my question for you is is it consistent, do you agree or disagree, with the proposition that in order for a guideline to be considered evidence-based, it should be based on high quality evidence?

A. The way that this is written here, what you just read me doesn't seem to be a quotation.

Q. That's all right, I'm just asking whether you agree with the proposition.

A. It might be a summary.

Q. Let me ask you a question in my own words: Do you agree or disagree that in order to be considered an evidence-based guideline, or an evidence-based recommendation, that that guideline or recommendation should be based on what is deemed high quality evidence according to principles of evidence-based medicine?

A. High quality evidence often refers to evidence derived from randomized controlled trials. And the vast majority of medical practice is informed by evidence that is not derived from

Page 203

randomized controlled trials. Vast majority of medical practice is informed by evidence derived from observational studies. Which puts us, according to the way the grade working group defines "evidence," not often in the realm of high quality evidence.

So I take this sentence that you read to me earlier to be a summary of something that a journalist interpolated from a quote. And I have good reason to disagree, that the majority of evidence-based guidelines are supported by high quality evidence.

MS. LEVI: I apologize, can we just take a very quick break?

MR. BROOKS: I'm in favor.

(R E C E S S)

BY MR. BROOKS:

Q. Let me ask you to look at your expert report, Exhibit 4. Turn to page 2. And there, in your Roman I heading, you assert that "Transitioning medications are safe and effective." Do you see that language?

A. I do.

Q. And is it your testimony that using puberty blockers to block natural, healthy puberty for a

Page 204

period of years in a child who's suffering no genetic defect or precocious puberty is known to medical science to be safe?

A. When accounting for the known adverse effects, the benefits of treatment, and the risks of treatment, it is my opinion that the use of puberty-blocking medications and treatment of gender dysphoria is safe.

Q. And is it your view that no responsible medical expert could say that it is presently unknown in important respects whether such use is safe?

(The reporter asked for clarification)

Q. Is it your testimony that no responsible medical expert could be of the view that it is presently unknown in important respects whether such use is safe?

A. I would need to know what important respects were being considered to proceed with answering your question.

Q. Well, is it your testimony that no responsible medical expert could be of the view that it is presently unknown whether the use of puberty blockers for an extended period of years in a child suffering no genetic defect or

Page 205

precocious puberty is safe with respect to neurodevelopment?

A. There are quite a few qualifiers and double negatives in there. I need to hear the question again.

(THE REPORTER READ THE RECORD)

A. I would need to know what was meant by "some years" in order to answer that question.

Q. Let's say three.

THE DEPONENT: I need the question back because of our interruption.

(THE REPORTER READ THE RECORD)

A. If someone were to express that view, it would be proper and correct to engage in a discussion with them about why they hold those views, and to review relevant literature pertinent to this specific issue.

Q. Are you aware that multiple European health authorities have now published statements to the effect that it is not known yet whether administration of puberty blockers for multiple years to children suffering from no genetic defect or precocious puberty is safe?

A. I am aware that some European countries have performed evidence reviews on that topic.

Page 206

Q. Are you unaware that they have made formal statements now that it is not yet known whether such treatments are safe?
A. I did not cite statements from other countries in any of my reports. And I would need to review them in detail to comment on their contents.
Q. As you sit here today, are you aware of whether or not some European health authorities have issued statements to the effect that it is unknown at present whether use of puberty blockers to treat gender dysphoria is safe?
A. I would need to specifically review the reports that those countries have produced, look at their methodology for making those statements, and then I would be able to answer your question.
Q. And are you telling me that you have not, either in your normal professional capacity or your preparation to provide expert testimony to the court in this case, you have not taken the time or the trouble to familiarize yourself with those recent European statements?
A. I don't know what statements specifically you're referring to. Specific details would help so I'm sure that we're talking about the same

Page 207

thing.
Q. Have you read Dr. Katz's interim report published for the National Health Service?
A. Yes, I have.
Q. Have you read the very recently published policy statements from the National Health Service?
A. Not in its entirety.
MR. BROOKS: Let me ask the reporter to mark as Exhibit 22, a document from NHS England titled "Clinical Policy Puberty Suppressing Hormones For Children and Young People Who Have Gender Incongruence/Gender Dysphoria," dated March 12, 2024.
(DEFENDANT'S EXHIBIT 22 FOR IDENTIFICATION Received and Marked.)
Q. Dr. McNamara, this document is both very recent, March 12th, and very short. Is it your testimony that prior to now, you have not read this two-page document?
A. I don't think I read this specific document.
Q. Well, it's just out. Let me ask you this: On the third page, the last line of the text states "We have concluded that there is not enough evidence to support the safety or clinical

Page 208

effectiveness of PSH to make the treatment routinely available at this time." And PSH is defined in the beginning of the document as "puberty suppressing hormones."
My question is this: Is it your testimony, do you intend to testify to the court that only a science denier could conclude that as of March 2024, there is not enough evidence to support the safety or clinical effectiveness of puberty suppression as a treatment for gender dysphoria?
MS. LEVI: Object as to form.
THE DEPONENT: Can I have the question back?
(THE REPORTER READ THE RECORD)
A. I am aware of multiple studies in the literature that show that puberty suppression is one effective treatment for youth suffering from gender dysphoria. And that statement does not -- that is my testimony. I'll leave it there.
Q. You're aware of -- you have reviewed the systematic reviews commissioned for the National Health Service of England, so-called Cass review, put out by their NICE organization; correct?
A. I have seen those reviews.
Q. And you're aware that when it comes to

Page 209

efficacy and benefit, those reviews conclude that all available evidence is of very low quality?
A. I am aware that as you described, that is a conclusion of that document.
Q. And you disagree with their evaluation of that evidence, am I correct?
A. I have seen instances of studies that they assessed, being assessed using the same methodology, and the authors come up with different results.
Q. And in your view, is that the sort of evaluation on which reasonable experts could disagree?
A. I would say that using an evidence assessment tool that is subjective and can be user dependent, is likely to lead to discrepant assessment.
Q. Now, backing up, do you intend to tell the court that only a science denier could conclude that as of March of 2024, there's not enough evidence to support the safety or clinical effectiveness of puberty suppressing hormones as a treatment for gender dysphoria?
MS. LEVI: Object as to form.
THE DEPONENT: Can I have the question

Page 210

back?
(THE REPORTER READ THE RECORD)
A. I would say that the available literature to date demonstrates both short term and medium term beneficial impact of puberty-suppressing medications as a treatment for gender dysphoria.
Q. And is it your expert opinion that any medical professional who disagrees with you about that must be denying the relevant science?
MS. LEVI: Object as to form.
A. It is my expert opinion that a careful assessment of all of the literature would yield the conclusion that in the short or medium term, puberty-suppressing medications confer benefit to youth with gender dysphoria if they qualify for, desire and receive them in accordance with the standard of care outlined by WPATH and the clinical practice guidelines outlined by the Endocrine Society.
Q. And therefore, it's your opinion that anybody who disagrees with you on that is simply denying the relevant science, or do you believe that's an issue on which reasonable scientists can differ?
MS. LEVI: Object as to form.

Page 211

THE DEPONENT: I'll take the question again, please.
(THE REPORTER READ THE RECORD)
A. I don't have a opinion on that.
Q. Do you know whether the Endocrine Society has anywhere taken an official position or indeed stated in the guidelines that the use of puberty blockers as a treatment for gender dysphoria is, quote, safe?
A. The Endocrine Society undertook a thorough inventory of the evidence on this issue. They sourced available studies at the time the guidelines were developed. And they issued a recommendation regarding the use of puberty-blocking medications for youth with gender dysphoria. I would need to refer to the specific guidelines to pull out the language, but I can tell you without doing so that their process undertook a consideration of the safety of that medication.
Q. Well, let's pull that out and see what they said about what they learned about safety through that process that you mention.
Exhibit 6, let me ask you to turn page 3874 in the Endocrine Society Guidelines. Towards the

Page 212

bottom of the first column is a paragraph, about two inches from the bottom, that begins "In the future." Find that for me, if you would.
A. Yes.
Q. It reads "In the future, we need more rigorous evaluations of the effectiveness and safety of endocrine and surgical protocols." And it goes on to call specifically for a careful assessment of "the effects of prolonged delay of puberty in adolescents on bone health, gonadal function, and the brain, including effects on cognitive, emotional, social and sexual development." Do you see that language?
A. Yes, I am reading this paragraph with you.
Q. All right. And you understand the reference to gonadal function to be a reference to fertility, right?
A. Yes.
Q. So what the Endocrine Society says here about safety is that we need more rigorous evaluations of the safety of puberty blockers with respect to -- let me start again.
What the Endocrine Society said here is that we needs more rigorous evaluations of the safety of endocrine treatments and in particular, with

Page 213

respect to the prolonged delay of puberty in adolescents on health issues, including those we've been discussing today; that is, fertility, brain development, sexual development; correct?
A. So this paragraph does not pertain explicitly to puberty-blocking medications.
Q. It does, if I may. The language I read five lines in refers specifically to the effects of prolonged delay of puberty in adolescents.
A. Okay, I suppose we're inferring from that --
Q. It's a complicated sentence, I grant you. But I'd like to focus on the call for a careful assessment of the following. And item one is, "the effects of prolonged delay of puberty in adolescents on bone health, gonadal function, and the brain." Correct?
A. That's correct, that's what it says.
Q. That is a reference to potential adverse effects of puberty blockade; correct?
A. That's correct.
Q. And what the Endocrine Society says is we need careful assessment of those potential adverse effects; correct?
A. They don't refer to them as adverse effects. They refer to them as effects.

Page 214

Q. Well, you would agree that any negative impact on brain development would be adverse, would you not?
A. I don't see discussion of negative impacts on brain development here.
Q. Dr. McNamara, this paragraph begins with a reference to safety. Do you believe that the Endocrine Society means, as you read this, to refer to positive impact?
A. I'm just reading the words on the page.
Q. Is that all? You don't think you understand it? Let me ask a question.
It's correct, is it not, that what the Endocrine Society says about safety in this paragraph, among other things, is that we need more careful assessment of the effect of puberty blockade in adolescents on bone health, gonadal function, and the brain?
A. They're saying that they need more rigorous evaluations of effectiveness and safety of the current protocols.
Q. And you agree with that, do you not?
A. In general, I would always agree with the pursuit of even more rigorous research.
Q. Insofar as you're aware, nowhere in the

Page 215

guidelines does the Endocrine Society tell the reader that the prolonged delay of puberty in adolescents is safe?
A. We would need to turn to the section, the section in this document, that discusses puberty blockade further.
Q. Well, before you said in your Expert Report that puberty blockade is safe. Did you not carefully review the Endocrine Society Guidelines to see whether the Endocrine Society thinks it safe?
A. I certainly did. And if we're going to discuss it in depth today, it would be best to move to that section of this document.
Q. And which section is it that you have in mind? Probably have 2.3 in mind, if I may.
A. The entire section of 2.0, as it begins on page 3880, would be good to consider on this topic.
Q. Well, I'll ask you this, due to shortness of time. 2.3 is the recommendation that says "where indicated, GnRH" -- that is, puberty suppression -- should be used "to suppress pubertal hormones," correct?
A. If pubertal suppression is being considered,

Page 216

a GnRH analog would be the proper medication to consider.
Q. And in the discussion that follows, there is a section headed "Side Effects" on the next page. Do you see that?
A. Yes.
Q. And there, in the discussion of what they refer to as primary risks of pubertal suppression, the Endocrine Society lists first, compromised fertility; and second, unknown effects on brain development. Am I right?
A. That's correct, that's what it says.
Q. And then a few lines down, they go on to say that a recent study also suggested suboptimal bone mineral accrual; correct?
A. "Initial data on gender dysphoric gender-incongruent subjects demonstrated no change of absolute Areal BMD during two years of GnRH analog therapy, but a decrease in bone mineral density Z scores."
So what that means is that that particular study --
Q. As you recall, is that the Klink study?
A. No.
Q. That's perhaps a more recent study, all

Page 217

right.
A. This particular study analyzes mineral density by using Z scores. Z scores of bone mineral density are a statistical comparison to age-matched controls. But there are no controls for interpopulation differences. And it is well known that youth with gender dysphoria deal with, unfortunately, certain naturalistic risk factors for lower bone mineral density.
Q. We're just speaking of risk factors, rather than causation, what the -- the third risk identified here, under the section "Side Effects" of puberty blockers by the Endocrine Society, is simply they point to a study that suggested suboptimal bone minimal accrual during puberty blockade treatment; correct?
A. That's correct.
Q. And they identify risk to fertility, risk to brain development, risk to bone accrual.
My question for you is, so far as you recall -- we're not going to look through the whole document. I just want to ask if you recall today, does the Endocrine Society anywhere in these guidelines assert that prolonged pubertal suppression, that is, for a period let's say of

Page 218

three or more years, to treat gender dysphoria in adolescents is, to quote the term you use in your Expert Report, safe?
A. In making the recommendation to offer puberty blockade to youth gender dysphoria, the Endocrine Society accounted for the safety profile and the risks and benefits of treating versus not treating.
Q. Well, to say that they accounted for it is not to say that it's safe. It's to say that they performed some balancing of potential harms against potential benefits, correct?
A. To me -- and it's my word that I use in my report, safe. To me, a consideration of safety requires balancing.
Q. That is balancing of potential harms versus potential benefits.
A. And the harms of treating versus not treating.
Q. Yes. Okay. Let me ask to you to find the SOC-8 again. And if you turn to page 47, it, in the first column, more than halfway down, begins a paragraph "Providers may consider."
A. I'm with you.
Q. And there, WPATH authors write "Providers

Page 219

may consider the possibility an adolescent may regret gender-affirming decisions made during adolescence, and a young person will want to stop treatment and return to living in the birth-assigned gender role in the future." Correct?
A. That's what it says.
Q. They go on to cite certain studies the WPATH believes show that the likelihood of that is low; am I correct?
A. That's correct.
Q. But then they say, "At present, no clinical cohort studies have reported on profiles of adolescents who regret their initial decision or detransition after irreversible affirming treatment. Recent research indicates there are adolescents who detransition." Do you see that?
A. Yes.
Q. And at the top of the next page, it states "Some adolescents may regret the steps they have taken."
Now, let me ask you, in using the word "regret" to describe the feelings of these individuals who undergo medical transition as adolescents and later change their view of

Page 220

their -- wish they had not go through those procedures, do you believe that WPATH was using harmful terminology?
A. What terminology specifically are you referring to?
Q. "Regret."
A. I don't associate any harm with that word.
Q. And similarly, when WPATH states that there are adolescents who detransition, do you have any objection to the use of the word "detransition" to describe an individual's return to identifying with his or her natal sex?
A. I prefer birth sex re-identification because it's more specific and it tells you what it means.
Q. Do you consider the term detransition to be misleading in any way?
A. I consider it to be somewhat ambiguous.
Q. What is the nature of the ambiguity you're concerned about?
A. It's hard to describe ambiguity.
Q. Well, you can point to some possible incorrect interpretation of it. Is there some way in which you believe that term is misleading?
A. I believe that it could describe many different experiences or phenomena that may not

Page 221

necessarily be related. And that is where the ambiguity, in my mind, stems from.
Q. The WPATH authors in column two, about an inch and half down, write "Providers should be prepared to support adolescents who detransition."
Do you agree that it's important that providers support adolescents who choose to detransition?
A. I believe that providers should support all adolescents in all areas of their life. And that includes agreeing with this sentence.
Q. And you've described earlier that Yale has a multidisciplinary approach to providing care for minors with gender dysphoria, correct?
A. That's correct.
Q. And would you agree that providers, including mental health providers, should support adolescents who detransition?
A. Yes, I do agree.
Q. And farther down in that, at the very end of that paragraph, the authors write "Many of them" -- referring to -- well, to use their term, detransitioning minors -- Many of them expressed difficulties finding help during their detransition process and reported their

detransition was an isolating experience during which they did not receive either sufficient or appropriate support." Do you see that?
A. I do see that.
Q. And as a pediatrician and clinician, does it cause you concern that as WPATH reports here, minors who have detransitioned have experienced difficulty in finding support from professionals?
A. I don't read this as saying that these patients were unable to find support from professionals. It's more general than that. And I would need to source the study that they cite to learn more. And I will say that there are likely many different reasons why such an individual may experience challenges in receiving sufficient or appropriate support.
MS. LEVI: I just want to get a time check.
MR. BROOKS: I suspect that's it, right?
(DISCUSSION HELD OFF THE RECORD)
MR. BROOKS: Thank you for your time. See you in Birmingham. Why that has to be in August is another question.
MS. LEVI: I do have a couple questions, --

MR. BROOKS: Yes, ma'am.
MS. LEVI: -- if I may. Do you need a minute?
THE DEPONENT: I'm ready.
MS. LEVI: I also want to give the attorney from the United States an opportunity if they want to ask some questions. So can we just take two minutes to figure out what we're going to do?
MR. BROOKS: Of course, yes.
(R E C E S S)
CROSS-EXAMINATION
BY MS. LEVI:
Q. I have one question for you. Has anything that you heard or read today changed your expert opinion regarding the safety and efficacy of gender transition medications for adolescents diagnosed with gender dysphoria?
A. No.
MS. LEVI: I have nothing further.
THE DEPONENT: Thank you.
MS. LEVI: Coty, are you there?
MS. MONTAG: I'm here, but no questions from the United States.
MS. LEVI: Okay. I think we're off the

record and concluded.
THE REPORTER: Could I just get clarification on transcripts?
MS. MONTAG: Yes, and I put my email and title and DOJ info in that chat.
(WHEREUPON, the deposition was concluded at 5:22 p.m.)

WITNESS INDEX

DEFENDANT'S EXHIBIT INDEX

C E R T I F I C A T E

I hereby certify that I am a Notary Public in and for the State of Connecticut duly commissioned and qualified to administer oaths. I further certify that the deponent named in the foregoing deposition was by me duly sworn and thereupon testified as appears in the foregoing deposition; that said deposition was taken by me stenographically in the presence of counsel and transcribed by means of computer-aided transcription by the undersigned, and the foregoing is a true and accurate transcript of the testimony.

I further certify that I am neither of counsel nor attorney to either of the parties to said suit, nor of either counsel in said suit, nor related to or employed by any of the parties or counsel to said suit, nor am I interested in the outcome of said cause.

Witness my hand and seal as Notary Public this 26th day of March, 2024.

NOTARY PUBLIC

My commission expires: 11/30/2027

EXHIBIT 60

CURRICULUM VITAE

Version Date: 1/2/23

Name: Meredithe McNamara, MD MSc

Contact Information: 789 Howard Avenue
Dana Clinic Building, DC-014
New Haven, CT 06519

Term: Primary Appointment: Assistant Professor, 9/1/21-9/1/24

School: Yale School of Medicine

Education:

08/2007-05/2007	BA, English Literature, Rutgers University, New Brunswick, NJ
07/2011-05/2013	MSc, Clinical Research, Emory University, Atlanta, GA
07/2008-05/2013	MD, Emory University School of Medicine, Atlanta, GA

Career/Academic Appointments:

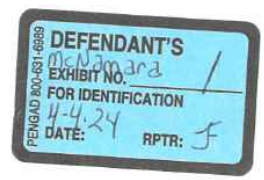
07/2013-06/2016	Residency, Pediatrics, the University of Chicago, Chicago, IL
07/2016-06/2017	Fellow, Leadership for Urban Primary Care Education and Transformation (LUCENT), Department of Internal Medicine, the University of Chicago, Chicago, IL
07/2017-06/2018	Clinical Associate, Department of Pediatrics, the University of Chicago, Chicago, IL
07/2018-06/2021	Fellow, Adolescent Medicine, University of Illinois-Chicago, Chicago, IL
9/2021-present	Assistant Professor, Department of Pediatrics, Yale University, New Haven, CT

Administrative Positions

2021-present	Director, Adolescent Medicine Rotation, Pediatrics Residency, Yale School of Medicine, New Haven, CT
2022-present	Board Member, Yale New Haven Health Committee for Juvenile Justice, New Haven, CT

Board Certification:

2016	American Board of Pediatrics, General Pediatrics
2022	American Board of Pediatrics, Adolescent Medicine



Professional Honors & Recognition:

International/National/Regional

2011 NIH/Atlanta Clinical and Translational Science Institute TL1 Predoctoral Research Training Award
2016 LUCENT Primary Care Fellowship, the University of Chicago
2020 Semi-Finalist, U.S. State Department, Fulbright Scholar Award (Uganda)

Grant/Clinical Trials History:

Past

6/2016-6/2017 Leadership for Urban Primary Care Education and Transformation Fellowship Grant – Full salary funding (50:50 research and clinical duties)
Mentor: Bradley Stolbach, PhD
$5000 from the Health Resources & Services Administration (HRSA)
Taught trauma informed care workshops in Chicago healthcare settings

6/2015-6/2017 "Improving Trauma-Informed Care Practices for Pediatric Victims of Violence"
Co-PI: Bradley Stolbach, Ph.D.; Meredithe McNamara, M.D.
$80,000 for two years from the Bright Promises Foundation
Developed and taught a curriculum of hospital-based trauma informed care at Comer Children's and John H. Stroger Hospitals

Invited Speaking Engagements, Presentations, Symposia & Workshops:

International and National

1. "How Adolescent Providers Can Support Youth-Led Advocacy," University of Washington. Seattle. 2022, 2021
2. "Grand Rounds: The Recovery of Adolescents and Young Adults from Firearm Violence," St. Joseph's Hospital, Paterson. 2022
3. "Hearing on Proposed Rule to Ban Gender Affirming Care for Youth," Florida Board of Medicine and Board of Osteopathic Medicine. Orlando. 2022
4. "Curriculum in Adolescent Health and Medicine," Busitema University. Mbale, Uganda. 2020

Regional

1. "Cross-Sector Collaboration for Police-Free Schools," Illinois Adverse Childhood Experiences Collaborative. Chicago. 2020
2. "Lessons in Trauma-Informed Care: A Panel Discussion with Youth Survivors of Violence," Windy City Emergency Medicine Conference. Chicago. 2017
3. "Being a Champion of Trauma-Informed Care," Student National Medical Association Midwest Meeting. Springfield. 2016

Local

1. "Heavy Menstrual Bleeding: High Yield Tips for the General Pediatrician." Connecticut AAP Conference. 2022
2. "Boosting Readiness for Eating Disorder Treatment in the Primary Care Setting." Pediatric Community Education Series, Bridgeport Hospital. 2022
3. "Preserving Adolescent Autonomy and Agency: Avoiding Reproductive Coercion," The University of Chicago. Chicago. 2021
4. "Innovation in Medical Education for Topics in Adolescent Health." University of Illinois-Chicago. Chicago. 2021
5. "Grand Rounds: Lessons from Police-Free Schools Advocacy in Chicago," Rush University. Chicago. 2021
6. "*Mycoplasma genitalium*: An Emerging STI." University of Illinois-Chicago. Chicago. 2020
7. "Adolescent Sports Medicine: Athlete Wellness and Risk of Injury," University of Illinois-Chicago. Chicago. 2020
8. "COVID-19 and Adolescent Wellness," Healing Hurt People-Chicago. Chicago. 2020

Peer-Reviewed Presentations & Symposia

International and National

1. **McNamara M**, Sequeira G, English A, Grubb L. "Restoring Integrity to Public Policy: Combating Science Denialism in Adolescent Health." Society of Adolescent Health and Medicine. Chicago, March 2023 (Symposium).
2. **McNamara M**, Olezeski C, Szilagyi N, Alstott A. "When Science is Misused in Law: How to Address the Biased Science that Underlies Legal Bans on Gender-Affirming Care for Youth." World Professional Association of Transgender Health (WPATH). Montreal, September 2022 (Symposium).
3. **McNamara M**, "A Curriculum in Adolescent Health and Medicine: Lessons from Mbale, Uganda." International Association of Adolescent Health. Lima, November 2021 (Oral presentation).
4. **McNamara M,** Wajarasi A, Brighton K, McMorris B, Safter M, Olupot-Olupot P, Miller K. "Implementation of an Adolescent Health and Medicine Course Designed for Medical Trainees in Low- and Middle-Income Countries: Results from a Pilot Study." International Association for Adolescent Health. Lima. November 2021. (Poster)
5. **McNamara M**, Hardy T. "The Health Maintenance of Adolescents and Young Adults Affected by Violent Injury," Adolescent Health Initiative. Ann Arbor, May 2021 (Symposium).
6. Fenton R, **McNamara M**. "Police-Free Schools: How Adolescent Providers Can Support Youth-Led Advocacy," Society of Adolescent Health and Medicine. San Diego, March 2021 (Oral Presentation).
7. **McNamara M**. "Training Hospital Personnel in Trauma-Informed Care: Assessing the Effectiveness of an Interprofessional Workshop with Patients as Teachers," Pediatric Academic Societies Annual Meeting. Baltimore, April 2019 (Oral presentation).
8. **McNamara M**. "Trauma Informed Care: A Workshop for Medical Providers," Society for Adolescent Health and Medicine Annual Meeting. New Orleans March 2017 (Symposium).

9. Miller K, **McNamara M**, McMorris B, Saftner M, Olupot-Olupot P. "An Adolescent Medicine Curriculum Designed for Low Income Countries: Results from Pilot Implementation at a Medical School in Easter Uganda." Society for Adolescent Health and Medicine. San Diego. March 2021 (Poster).
10. Miller K, **McNamara M**, McMorris B, Saftner M, Olupot-Olupot P. "Pilot implementation of a curriculum in adolescent health and medicine: a course designed for medical trainees in low- and middle-income countries." Virtual poster presentation at the University of Minnesota – Pediatric Research, Education & Scholarship Symposium. *Winner – Best Fellow Research Award.* Minneapolis. April 2020 (Poster).
11. Cane R, **McNamara M**, Schwartz A, Stolbach B. "Training Hospital Personnel in Trauma-Informed Care: Assessing the Effectiveness of an Interprofessional Workshop with Patients as Teachers." Pediatric Hospital Medicine Meeting. Seattle. July 2019 (Poster).
12. **McNamara M**, Cane R, Schwartz A, Stolbach B. "Training Hospital Personnel in Trauma-Informed Care: Assessing the Effectiveness of an Interprofessional Workshop with Patients as Teachers." Pediatric Academic Societies Annual Meeting. Baltimore. April 2019 (Poster).
13. Tucker X, Dholakia A, **McNamara M,** Cane R, Hoffman Y, Stolbach B. "Building a Trauma-Informed Hospital: A Longitudinal Qualitative Study of Participants in a Trauma-Informed Care Training." American Association of Medical Colleges Meeting. Grand Rapids. March 2019 (Poster).
14. Dholakia A, Tucker X, **McNamara M,** Cane R, Hoffman Y, Stolbach B. "Expanding the Culture of Trauma-Informed Care: A Pilot Training Workshop for Medical Students." American Association of Medical Students Conference. Grand Rapids. March 2019 (Poster).

Local

1. Tucker X, Dholakia A, **McNamara M,** Cane R, Hoffman Y, Stolbach B. "Building a Trauma-Informed Hospital: Preliminary Results from a Longitudinal Qualitative Study of Participants in a Trauma-Informed Care Training Workshop." The University of Chicago Medical Education Research Symposium. *Winner – Best Medical Student Presentation.* Chicago. September 2018 (Poster)
2. **McNamara M**, Cane R, Schuster L, Stolbach B. "Improving Trauma-Informed Care Practices for Pediatric Patients Affected by Violence." Leadership for Urban Primary Care Education and Transformation (LUCENT) Scholars Research Symposium. Chicago. June 2017 (Poster)
3. **McNamara M,** Cane R, Schuster L, Stolbach B. "Improving Trauma-Informed Care Practices for Pediatric Patients Affected by Violence." The University of Chicago Medical Education Research Symposium. Chicago. December 2016 (Poster)
4. **McNamara M**, Cane R, Stolbach B. "Healing Hurt People-Chicago: Creating a Hospital Culture of Trauma-Informed Care." University of Chicago Department of Pediatrics Research Symposium. Chicago. June 2016 (Poster)

Professional Service

Journals

2022 Reviewer for *Pediatrics*, *Transgender Health, LGBTQ Health*

Public Service/Media Presence:

Public Service:

2015-2021	Healing Hurt People – Chicago, Illinois: Coordinating medical care for youth recovering from violent injury, co-leading trauma recovery workshops with youth clients, providing trauma-focused psychoeducation
2020-2021	Atlas International – Mbale, Uganda: Fundraising and donations procurement of for Mbale Regional Referral Hospital and Busitema University
2019-2020	Task Force, Cook County Health Systems – Chicago, Illinois: Provided confidential health screening and counseling to youth at social events

Bibliography:

Peer-Reviewed Original Research

1. **McNamara M**, Kempton C, Antun A. "The Role of Disease Severity in Influencing Body Mass Index in People with Hemophilia: A Single Institution Cross-sectional Study." *Haemophilia.* 2013; 111th ser. 10.11 PMID: 24118577
2. **McNamara M**, Cane R, Hoffman Y, Reese C, Schwartz A, Stolbach B. "Training Hospital Personnel in Trauma-Informed Care: Assessing an Interprofessional Workshop with Patients as Teachers." *Academic Pediatrics*. 2020; S1876-2859 (20) 30190-X. PMID: 32492574
3. Miller K, Saftner M, **McNamara M**, McMorris B, Olupot-Olupot P. "Provision of adolescent health care in Resource-Limited Settings: Perceptions, practices and training needs of Ugandan health care workers." *Children and Youth Services Review*, Volume 132, 2022, 106310, ISSN 0190-7409, https://doi.org/10.1016/j.childyouth.2021.106310.

Chapters

1. **McNamara M**, and Sharma J. Surgical Approaches to Endocrine Disorders. In Felner EI, Umpierrez G. *Endocrine Pathophysiology*. Lippincott Williams & Wilkins; 2013.
2. Cabral MD, Khan A, **McNamara M**, Dharmapuri S, Linares S, Cielo A. Renal manifestations of sexually transmitted infections. In Greydanus D, et al, eds: Chronic Disease and Disability: The Pediatric Kidney. 2nd edition, New York: Nova Science, 2022.

Peer-Reviewed Case Reports

1. Yano S, **McNamara M**, Halbach S, Waggoner D. "4q21 microdeletion in a patient with epilepsy and brain malformations." *American Journal of Medical Genetics*. 2015; 9999 A: 1-5. PMID: 25847229

Peer-Reviewed Commentaries

1. **McNamara M**, Lepore C, Alstott A, Kamody R, Kuper L, Szilagyi N, Boulware S, Olezeski C. Scientific misinformation and gender affirming care: tools for providers on the front lines. Journal of Adolescent Health. 2022 Jul 1:S1054-139X(22)00503-1. doi: 10.1016/j.jadohealth.2022.06.008. PMID: 35787819.
2. Lepore C, Alstott A, **McNamara M**. Scientific misinformation is criminalizing the standard of care for transgender youth. JAMA Pediatrics. 2022;176(10):965–966. doi:10.1001/jamapediatrics.2022.2959. PMID: 35994256.
3. **McNamara M**, Lepore C, Alstott A. Protecting transgender health and challenging science denialism in policy. New England Journal of Medicine. 2022 Nov 24;387(21):1919-1921. doi: 10.1056/NEJMp2213085. PMID: 36409481.

Editorials, and Letters

1. Markowitz M, **McNamara M**. "A call to action: considerations for pediatricians in a post-Roe healthcare system." AAP Voices Blog, August 11, 2022. https://www.aap.org/en/news-room/aap-voices/a-call-to-action-considerations-for-pediatricians-in-post-roe-health-care-system/
2. Olezeski C, **McNamara M**, Alstott A. "Denying trans youth gender affirming care is an affront to science and medical ethics" Los Angeles Times, June 13, 2022. https://www.latimes.com/opinion/story/2022-06-13/trans-youth-healthcare-state-bans

Exhibit B

ADDENDUM

In addition to the citations in the above attached report, I also relied on the following articles in forming my expert opinions:

AACAP. AACAP statement opposing actions in Texas [Internet]. Aacap.org. [cited 2023 Jan 31]. Available from: https://www.aacap.org/AACAP/zLatest_News/AACAP_Statement_Opposing_Actions_in_Texas

AACAP. AACAP statement responding to efforts to ban evidence-based care for transgender and gender diverse [Internet]. Aacap.org. [cited 2023 Jan 31]. Available from: https://www.aacap.org/AACAP/Latest_News/AACAP_Statement_Responding_to_Efforts-to_ban_Evidence-Based_Care_for_Transgender_and_Gender_Diverse.

Allen LR, Watson LB, Egan AM, Moser CN. Well-being and suicidality among transgender youth after gender-affirming hormones. Clinical Practice in Pediatric Psychology. 2019 Sept;7(3):302–311. doi: 10.1037/cpp0000288.

Bornstein SR, Allolio B, Arlt W, Barthel A, Don-Wauchope A, Hammer GD, Husebye ES, Merke DP, Murad MH, Stratakis CA, Torpy DJ. Diagnosis and Treatment of Primary Adrenal Insufficiency: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2016 Feb;101(2):364-89. doi: 10.1210/jc.2015-1710. Epub 2016 Jan 13. PMID: 26760044; PMCID: PMC4880116.

Brouwers M, Kho ME, Browman GP, Cluzeau F, feder G, Fervers B, Hanna S, Makarski J on behalf of the AGREE Next Steps Consortium. AGREE II: Advancing guideline development, reporting and evaluation in healthcare. Can Med Assoc J. Dec 2010, 182:E839-842; doi: 10.1503/cmaj.090449.

Carmichael P, Butler G, Masic U, Cole TJ, De Stavola BL, Davidson S, Skageberg EM, Khadr S, Viner RM. Short-term outcomes of pubertal suppression in a selected cohort of 12 to 15 year old young people with persistent gender dysphoria in the UK. doi: 10.1371/journal.pone.0243894.

Chen D, Berona J, Chan YM, Ehrensaft D, Garofalo R, Hidalgo MA, Rosenthal SM, Tishelman AC, Olson-Kennedy J. Psychosocial Functioning in Transgender Youth after 2 Years of Hormones. N Engl J Med. 2023 Jan 19;388(3):240-250. doi: 10.1056/NEJMoa2206297.

Coleman E, Radix AE, Bouman WP, Brown GR, de Vries ALC, Deutsch MB, Ettner R, Fraser L, Goodman M, Green J, Hancock AB, Johnson TW, Karasic DH, Knudson GA, Leibowitz SF, Meyer-Bahlburg HFL, Monstrey SJ, Motmans J, Nahata L, … Arcelus J. Standards of Care for the Health of Transgender and Gender Diverse People, Version 8. Int J Transgend Health. 2022 Sep 6;23(Suppl 1):S1-S259. doi: 10.1080/26895269.2022.2100644. PMID: 36238954; PMCID: PMC9553112.

Costa R, Dunsford M, Skagerberg E, Holt V, Carmichael P, Colizzi M. Psychological Support, Puberty Suppression, and Psychosocial Functioning in Adolescents with Gender Dysphoria. J Sex Med. 2015 Nov;12(11):2206-14. doi: 10.1111/jsm.13034.

de Vries AL, Steensma TD, Doreleijers TA, Cohen-Kettenis PT. Puberty suppression in adolescents with gender identity disorder: a prospective follow-up study. J Sex Med. 2011 Aug;8(8):2276-83. doi: 10.1111/j.1743-6109.2010.01943.x.

de Vries AL, McGuire JK, Steensma TD, Wagenaar EC, Doreleijers TA, Cohen-Kettenis PT. Young adult psychological outcome after puberty suppression and gender reassignment. Pediatrics. 2014 Oct;134(4):696-704. doi: 10.1542/peds.2013-2958.

Durwood L, McLaughlin KA, Olson KR. Mental health and self-worth in socially transitioned transgender youth. Journal of the American Academy of Child & Adolescent Psychiatry 2017 Feb;56(2):116-23. doi: 10.1016/j.jaac.2016.10.016.

Fleseriu M, Hashim IA, Karavitaki N, Melmed S, Murad MH, Salvatori R, Samuels MH. Hormonal Replacement in Hypopituitarism in Adults: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2016 Nov; 101(11): 3888–3921. doi: 10.1210/jc.2016-2118.

Grannis C, Leibowitz SF, Gahn S, Nahata L, Morningstar M, Mattson WI, Chen D, Strang JF, Nelson EE. Testosterone treatment, internalizing symptoms, and body image dissatisfaction in transgender boys. Psychoneuroendocrinology. 2021 Oct;132:105358. doi: 10.1016/j.psyneuen.2021.105358. Epub 2021 Jul 17. PMID: 34333318.

Green AE, DeChants JP, Price MN, Davis CK. Association of Gender-Affirming Hormone Therapy With Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth. J Adolesc Health. 2022 Apr;70(4):643-649. doi: 10.1016/j.jadohealth.2021.10.036.

Hembree WC, Cohen-Kettenis PT, Gooren L, Hannema SE, Meyer WJ, Murad MH, Rosenthal SM, Safer JD, Tangpricha V, T'Sjoen GG. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2017 Nov; 102(11): 3869–3903. doi: 10.1210/jc.2017-01658.

Hisle-Gorman E, Schvey NA, Adirim TA, Rayne AK, Susi A, Roberts TA, Klein DA. Mental Healthcare Utilization of Transgender Youth Before and After Affirming Treatment. J Sex Med. 2021 Aug;18(8):1444-1454. doi: 10.1016/j.jsxm.2021.05.014.

Institute of Medicine, Clinical Practice Guidelines We Can Trust. The National Academies Press. 2011. doi: 10.17226/13058.

Kaltiala R, Heino E, Työläjärvi M, Suomalainen L. Adolescent development and psychosocial functioning after starting cross-sex hormones for gender dysphoria. Nord J Psychiatry. 2020 Apr;74(3):213-219. doi: 10.1080/08039488.2019.1691260.

Kuper L, et al., Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy, 145(4) Pediatrics e20193006 (2020).

Lenders JW, Duh QY, Eisenhofer G, Gimenez-Roqueplo AP, Grebe SK, Murad MH, Naruse M, Pacak K, Young WF Jr; Endocrine Society. Pheochromocytoma and paraganglioma: an endocrine society clinical practice guideline. J Clin Endocrinol Metab. 2014 Jun;99(6):1915-42. doi: 10.1210/jc.2014-1498.

Littman L. Individuals Treated for Gender Dysphoria with Medical and/or Surgical Transition Who Subsequently Detransitioned: A Survey of 100 Detransitioners. Arch Sex Behav. 2021 Nov;50(8):3353-3369. doi: 10.1007/s10508-021-02163-w. Epub 2021 Oct 19. PMID: 34665380; PMCID: PMC8604821.

Pereyra Pacheco B, Méndez Ribas JM, Milone G, Fernández I, Kvicala R, Mila T, Di Noto A, Contreras Ortiz O, Pavlovsky S. Use of GnRH analogs for functional protection of the ovary and preservation of fertility during cancer treatment in adolescents: a preliminary report. Gynecol Oncol. 2001 Jun;81(3):391-7. doi: 10.1006/gyno.2001.6181.

Rew L, Young CC, Monge M, Bogucka R. Review: Puberty blockers for transgender and gender diverse youth-a critical review of the literature. Child Adolesc Ment Health. 2021 Feb;26(1):3-14. doi: 10.1111/camh.12437.

Russell ST, Pollitt AM, Li G, Grossman AH. Chosen Name Use Is Linked to Reduced Depressive Symptoms, Suicidal Ideation, and Suicidal Behavior Among Transgender Youth. J Adolesc Health. 2018 Oct;63(4):503-505. doi: 10.1016/j.jadohealth.2018.02.003.

SAMHSA. Ending Conversion Therapy: Supporting and Affirming LGBTQ Youth [Internet]. 2015 [cited 2023Jan31]. Available from: https://store.samhsa.gov/sites/default/files/d7/priv/sma15-4928.pdf

Schünemann H, Brożek J, Guyatt G, Oxman A, editors. GRADE handbook for grading quality of evidence and strength of recommendations. Updated October 2013. The GRADE Working Group, 2013. Available from guidelinedevelopment.org/handbook.

Tordoff DM, Wanta JW, Collin A, Stepney C, Inwards-Breland DJ, Ahrens K. Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Gender-Affirming Care. JAMA Netw Open. 2022;5(2):e220978. doi:10.1001/jamanetworkopen.2022.0978

Turban JL, King D, Kobe J, Reisner SL, Keuroghlian AS. Access to gender-affirming hormones during adolescence and mental health outcomes among transgender adults. PLoS One.

2022 Jan 12;17(1):e0261039. doi: 10.1371/journal.pone.0261039. PMID: 35020719; PMCID: PMC8754307.

van der Loos MATC, Hannema SE, Klink DT, den Heijer M, Wiepjes CM. Continuation of gender-affirming hormones in transgender people starting puberty suppression in adolescence: a cohort study in the Netherlands. Lancet Child Adolesc Health. 2022 Dec;6(12):869-875. doi: 10.1016/S2352-4642(22)00254-1.

Van der Miesen AI, Steensma TD, de Vries AL, Bos H, Popma A. Psychological Functioning in Transgender Adolescents Before and After Gender-Affirmative Care Compared with Cisgender General Population Peers. Journal of Adolescent Health 2020 Jun;66(6):699-704.

World Health Organization. Gender incongruence and Transgender Health in the ICD. Updated 2022. Available from: https://www.who.int/standards/classifications/frequently-asked-questions/gender-incongruence-and-transgender-health-in-the-icd

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

EMMA KOE, et al., Plaintiffs, V. CAYLEE NOGGLE, et a., INC., ET AL, Defendants.	Civil Action No. 1:23-CV-02904-SEG Volume 1 of 2

Transcript of proceedings
before the Honorable Sarah E. Geraghty,
United States Magistrate Judge
August 10, 2023.

A P P E A R A N C E S:

On Behalf of the Plaintiff:

Benjamin Bradshaw, Esq.
Stephen McIntyre, Esq.
Meredith Garagiola,Esq.
O'Melveny & Myers

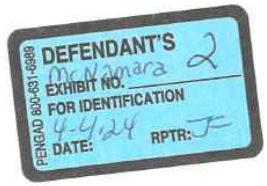
Cynthia Cheng-Wun Weaver, Esq.
Human Rights Campaign Foundation

Elizabeth Lynn Littrell, Esq.
Southern Poverty Law Center

Cory Isaacson, Esq
American Civil Liberties Union

On behalf of the Intervenors:

Edward D. Buckley, Esq.
Thomas Joseph Mew, IV, Esq.



On Behalf of the Defendants:

Patrick Strawbridge, Esq.
Jeffrey Matthew Harris, Esq.
Tiffany Bates,Esq.
Consovoy McCarthy PLLC

Proceedings recorded by mechanical stenography, transcript produced by computer.

Melissa Brock, RMR, RPR
Federal Official Court Reporter
75 Ted Turner Drive, SW, Suite 1949-B
Atlanta, Georgia 30303-3309

I N D E X

PROCEEDINGS

THE COURT: This is case number 23CV2409.

We are here for a hearing on the Plaintiffs' Motion for a Preliminary Injunction.

Counsel, can you please announce your appearances, starting with the Plaintiffs.

MR. BRADSHAW: Good morning, Your Honor. Ben Bradshaw from O'Melveny & Myers for the Plaintiffs.

THE COURT: Good morning.

MR. MCINTYRE: Good morning, Your Honor. Steven Mcintyre from O'Melveny & Myers.

MS. GARAGIOLA: Good morning, Your Honor. Meredith Garagiola with O'Melveny & Myers, also for the Plaintiffs.

MS. WEAVER: Good morning. Cynthia Weaver with the Human Rights Campaign Foundation.

MS. LITTRELL: Good morning, Your Honor. Beth Littrell with the Southern Poverty Law Center, also for the Plaintiffs.

MS. ISAASCON: Cory Isaacson with the ACLU Foundation of Georgia.

MR. BUCKLEY: Good morning, Your Honor. Ed Buckley for Nancy Doe and Linda Doe.

MR. MEW: Good morning, Your Honor. Tom Mew also on behalf of the Doe Intervenors for the Plaintiffs.

MR. STRAWBRIDGE: Good morning, Your Honor. Patrick

Q Is this text, this recommendation in Box 12, consistent with the WPATH Standards of Care and the Endocrine Society Clinical Guidelines?

A Yes.

MR. MCINTYRE: No further questions at this time.

THE COURT: All right. Thank you very much, Dr. Shumer.

Are we finished with this witness?

MR. BRADSHAW: Yes, Your Honor.

MR. STRAWBRIDGE: Nothing else for Defendants.

THE COURT: Counsel, are you ready to call your next witness?

MR. BRADSHAW: Raise your right hand.

MEREDITH MCNAMARA,

a witness herein, having been first duly sworn, was examined and testified as follows:

COURTROOM DEPUTY: You may be seated.

Ma'am, I just want to remind you it's very important for everyone in court to hear your testimony this morning, as you may help yourself to the water, so please remember to speak directly into the microphone.

Can you please state and spell your first and last name for the record.

THE WITNESS: Yes. M-e-r-e-d-i-t-h M-c-N-a-m-a-r-a.

COURTROOM DEPUTY: Thank you.

DIRECT EXAMINATION

BY MS. WEAVER:

Q Good morning, Dr. McNamara.

What is your profession?

A I am a pediatrician and adolescent medicine specialist.

Q Could you summarize your formal education and training to become a doctor?

A Yes. I received my M.D. and Masters in Clinical Research from Emory University. I completed a Residency in Pediatrics at the University of Chicago and a Fellowship in Adolescent Medicine at the University of Illinois in Chicago.

Q Why are you here today?

A I am here to provide expert testimony regarding pediatric adolescent medicine and clinical research as it pertains to medical treatments for gender dysphoria for minors.

Q What is clinical research?

A Clinical research is a broad term to describe all scientific inquiry into the efficacy and safety of medical treatments and the various phenomenon that describe human disease.

Q And what are the goals of clinical research?

A To improve and perfect clinical practice. So identify knowledge gaps and to fill them and to make our therapies as effective as possible for our patients.

Q Can you talk about the different types of clinical

research that there are?
A So two broad categories of studies designs. One we've talked about a lot today, Randomized Controlled Trials and the other category would be observational study.
Q What's the main difference between the two different types of designs?
A So Randomized Controlled Trials as we've discussed, involve two study groups. One in which subjects are randomized to receive no treatment and one in which subjects are randomized to receive treatment. The idea is that everything else about them is the same and so their outcomes are followed over time. The idea in Randomized Controlled Trials is that they can identify as close as possible the independent effects of an intervention on an outcome.

Observational studies are different. So they encompass another kind of like wide variety of study designs but the idea is that subjects are observed naturalistically in settings that they would be in no matter what, whether or not there was clinical research going on and their outcomes are studied as well. The factors that contribute to those outcomes are analyzed with a variety of statistical methods.
Q Now is there a study design of the two that's considered one to yield the best results?
A Randomized Controlled Trials are acknowledged to produce high-quality evidence.

Q Is there a hierarchy of evidence quality as you understand there to be?
A There is a hierarchy. I would say that there is not a strict hierarchy that applies to every single command of clinical care equally, but the idea is that Randomized Controlled Trials are superior to observational study and below that are other types of research, like case reports, things that are not nearly as robust.
Q What situation, if any, are there that Randomized Controlled Trials study would not be appropriate -- would not be the appropriate design to use?
A There are many situations. So, first of all, if the disease state or other medical condition is quite rare, it would be really hard to recruit enough participants to achieve statistical power. You have to have enough participants in order to even notice a difference. If you have a hundred versus a hundred thousand, that contributes to the strength of the study and robustness of your findings. However, when it comes to rare conditions, that's sometimes prohibitively difficult to obtain.

If a condition is rare and treatment is highly sought after, if the condition is quite serious and timely interventions are needed, then a Randomized Controlled Trial would actually be considered unethical because it could be coercive. People might sign up for the study in the hopes

that they could obtain the treatment. But then what -- the problem with that is that research studies are never supposed to coerce their participants into engaging into that study. That's a pretty profound ethical violation.

And then, finally, if participants could easily become aware of the treatment that they were assigned to then the Randomized Controlled Trial design would simply be logically inappropriate.

For all of those reasons, institutional review constitute protocols and they decide whether or not the study design is appropriate or ethical.

Q Now what ethical concerns, if any, are there to use a Randomized Controlled Trial to study the relationship between the use of transitional medications for adolescents and patient outcomes?

A They're all the ones I just mentioned. So it would be highly unethical and impractical to conduct. Randomized Controlled Trials uses a lot of resources. It would be really hard to recruit participants. The participants that potentially did sign up might feel coerced or motivated to participate on the off chance that they could get a treatment. And, notably, you know, after a few months of participation, participants would know whether or not they were receiving active treatment. And once you know the inherent strength of the Randomized Controlled Trial, which is blinding, it's gone.

Q How do doctors use clinical research to inform their practice of medicine?
A We use clinical research. So we use research that informs guidelines. We look at best available evidence. We look at newly-published evidence. And that is all incredibly helpful in caring for the patient in front of us. But there is -- there is a really important individualized approach that we take with the patients sitting in front of us. So I would say it's a very significant part, and there are other factors, too.
Q And would clinicians treat patients based on research that do not use Randomized Controlled Trial studies?
A Yes, absolutely. About 85 percent of evidence that guides clinical care is not based on Randomized Controlled Trials at all. And I'm speaking across the board about all of medicine.
Q Defendants' experts have submitted declarations in this case. Have you reviewed their declarations?
A Yes.
Q And Dr. Cantor and Laidlaw referred to systematic reviews in their declaration.
What is a system review of literature?
A A systematic review kind of tells you what it is. It's a systematic approach to searching databases of clinical research and using specific terms to answer a research

question. A large number of studies are gathered. The number of studies that the investigator analyze and kind of collate results amongst is windled down using exclusion criteria and the results of the systematic review are essentially a function of the backgrounds of the authors who have conducted them, the search terms that they've used, the exclusion criteria they have applied to not analyze certain studies and the conclusions that they draw.

Q And Defendants cite to a systematic review published in the Littman Study. Are you aware of this systematic review?

A Yes, I have reviewed.

Q What is your assessment of that systematic review?

A So that single review, as best I can tell, it was performed by people with epidemiologic and biostatistic backgrounds. I did try to see if those authors had any experience, clinical experience, in treating gender dysphoria or produced research in the field, any subject matter expertise specifically. I couldn't detect any.

But, moreover, I have a couple of takeaways. So I felt that that review tried to answer a lot of different questions. And we have word counts with journal articles. So, you know, it's answering questions about psychosocial benefits, efficacy of treatments, safety. That's a lot of broad topics to cover within one systematic review. Some of them were robust ones and the more in-depth ones I have seen just handled one

research question.

I also felt that there search terms were a little bare. They didn't include, for instance, cross-sex hormones in order to search the literature. So that could have excluded important studies. Moreover, the study was published in the Spring of 2023, but the later bound of the date range that they searched for published studies within was in 2021, and more studies have come out since then that the review does not include. So, you know, systematic reviews are only able to reflect the time period that they search. And I would say that it does not reflect best available evidence.

Q What is your response, then, to allegations, the defense experts allegations, that this particular systematic review concluded does not have enough evidence showing benefits of hormone therapy for adolescent patients?

A I would say that those conclusions, kind of similar to what I said earlier, are a function more so of what I perceive to be the author's maybe inability to engage with the nuances of the observational studies that we have.

So systematic reviews that answer the exact same research question do produce very divergent results. They are subject to the same methodological biases and they can produce heterogeneous findings that can be a scientific debate, but looking at one or just a few is a very flawed way to assess all of the evidence about the literature.

I would also say that it's a little bit out of date. Like I said earlier and, you know, I've addressed systemic reviews that I feel are more methodologically sound, more able to engage with the nuance findings of observational studies.

Q What is the role of systematic reviews in creating clinical practice guidelines?

A Systematic reviews in general are commissioned by expert panels that produce clinical practice guidelines. So it is one of other things that these expert panels can use to produce their guidelines to inform their colleagues who provide clinical care on the ground.

Other things that these expert panels use include their expertise in considering the effects of not treating or not offering care. Their expertise on patients preferences and values. Resources that would be consumed by either not treating or treating, and then other real-world considerations. So it is one part of a larger machine and all of those parts are critical.

Q To your knowledge, what clinical studies, if any, are there that conclude transitional medications for gender dysphoria should be prohibited or not used?

A I have never read that conclusion in this study.

Q How about systematic reviews?

Have you read any systematic reviews that come to that same conclusion?

A No.
Q Now Dr. Cantor in his declaration report relies on what is a Pyramid of Evidence to say that systematic reviews are of the highest quality of evidence. Do you know what this Pyramid of Evidence is?
A Yes. I have seen the Pyramid of Evidence.
Q What is it?
A It is a pyramid with kind of a broad base and a narrower top and at the top of the pyramid are systematic reviews. Below that are Randomized Controlled Trials. Below that are observational studies. You know, the narrow base also -- the shape of the pyramid corresponds to the number of studies available in each of the tiers in the pyramid. And then below observational studies would be kind of like case reports and other types of studies that are considered to be less robust.
Q And how are clinicians to view this various types of evidence, if there is a gap between the results of, say, a systematic review and what is needed in clinical care for a patient?
A Well, you wouldn't use a systematic review to provide clinical care. A systematic review can inform the developers of the clinical practice guidelines. But in practice, physicians, clinicians of all disciplines rely on the guideline development processes that are quite sound and well respected and themselves built off of the guidelines. There

are guidelines for how you make guidelines. We don't use systematic reviews to guide clinical care.

Q I want to talk a little bit more about clinical practice guidelines. What guidelines or standards, if any, in the US are recognized within the medical and mental health field for treating transgender adolescents with gender dysphoria?

A So these are not specific to the United States. They are considered to be internationally used and respected, but the WPATH 8th Edition and the Endocrine Society Guidelines last issued in 2017.

Q What types of evidence or reviews are these guidelines based on?

A WPATH commissions systematic reviews that were performed by public health researchers and subject matter experts at Johns Hopkins. Those investigators at that School of Public Health used the Agency for Healthcare Research and Quality, the HRQ Guidelines, for performing systematic reviews, and the HRQs are part of the federal government and kind of like a large, impartial federal body that helps direct the analysis of clinical research, among other things.

Q Talk more about the Endocrine Society Guidelines.

What is the purpose of these guidelines?

A To support and inform and help endocrinologists throughout the world who care for transgender people to provide evidence-based care for their patients.

Q Are you aware of any studies out there showing that adherence to these guidelines fulfills this purpose?
A Yes. So just recently, a study was published by Gupta and colleagues from Emory which was a retrospective chart analysis of all the patients that have received care at their clinic over the preceding, I believe, it was ten years or so, but I'd have to look at it to refresh my follow-up period. But most importantly, what it showed is that all of the -- the vast majority of adolescents received care or continued care. Two discontinued care. One to pursue pregnancy options and one for another reason I can't remember. Most importantly what this really shows is that the vast majority of adolescents who receive care in accordance with the Endocrine Society's Clinical Practice Guidelines continue this care and none of the patients who paused treatment identified with their sex assigned at birth, meaning that they later determined that they weren't transgender. That was not observed.
Q And for these guidelines, what method was used to develop them?
A The Endocrine Society uses the GRADE approach to look at evidence and to make clinical practice recommendations for care.
Q And what does the GRADE methodology consist of?
A So under the GRADE model, Randomized Controlled Trials

are automatically considered high quality. Observational studies are automatically considered low quality and various aspects of those studies can be used to up or downgrade the quality of evidence.

The Endocrine Society used those guidelines for guideline development to issue strong or weak recommendations. And the strength of the recommendation depends on the quality of evidence and also on other factors that are incredibly pertinent to patient care. Some of the ones I have mentioned already.

Q Defendants' expert pointed out how the Endocrine Society Guidelines issued recommendations based on low-quality evidence.

What does it mean for clinicians treating patients with gender dysphoria with this low-quality evidence based recommendation?

A So the provision of gender-affirming care for transgender adolescents is based on low-quality evidence. That's a technical term that was assigned based on the study designs and determination of how the studies were conducted. That is not surprising or unusual at all.

As I mentioned before, 85 percent of clinical care is based -- is grounded on low-quality evidence. As a pediatrician and adolescent medicine physician, I look at low-quality evidence or very low-quality evidence all the time

to care for my patients and I'm very confident that I'm serving them with the best available care.

Just, you know, kind of some general examples, the use of hormonal treatments to treat heavy menstrual bleeding is direct from the low-quality evidence.

I recently prescribed a puberty blocker to a young female to preserve her fertility while she underwent chemotherapy. That was based on very low-quality evidence. Never -- no Randomized Controlled Trial was done there to my knowledge.

Other aspects of pediatric care, the treatment of croup with steroids can be lifesaving. I've definitely been there at the bedside when patients are crashing and they need those steroids. We give it to them and the quality of evidence is quite low. But the effects of the care are -- the benefits are tremendous.

Q And under the GRADE system, you talked about the strength of the recommendations.

What are the different types of strength of the recommendations?

A Yes. So we touched on this. There are strong and weak recommendations.

Q And would clinicians be able to rely on both strong and weak recommendations?

A Yes, absolutely.

Q And in the course of a doctor's practice, how would the

doctor change a patient's treatment path, based on whether a recommendation was strong or weak?

A I don't know that we would necessarily change the treatment path. We would certainly have a more in-depth discussion, more shared decision making. I would say that if the recommendation were weak, that would mean that we would have a long discussion about other options and take more time to elicit the patient's values and preference of those, of their medical decisions.

Q Let's turn to studies on transitioning medication such as blockers and hormone therapy.

What are the goals of transitioning medications?

A Well, the goals of medical aspects of gender-affirming care are to help the patient achieve appearance congruence, meaning that their internal sense of self is aligned with how they look and present externally to the world.

Q So go into a little more detail.

What are the positive physical or mental health outcomes of taking these medications?

A Broadly speaking, the benefits of gender-affirming care on -- for trans adolescents are profound. You know, adolescence is a really pivotal period of development and to divert somebody from an adolescence of suffering and extreme distress, has positive impacts that pay off throughout adulthood.

A lot of my patients who have received medical aspects of gender-affirming care get to enjoy -- they get to thrive. You know, they get to perform their best at school. They get to develop their talents. They get a softer landing into adulthood. So that's kind of me speaking from my clinical experience.

From an evidentiary standpoint, the studies that demonstrate the gender-affirming care demonstrate significant improvements in depression and anxiety, non-suicidal self injury and suicidal ideation as well as improved body satisfaction and improved psychosocial functioning.

Q On mental health benefits, how are mental health benefit studied?

A There are a large variety of psychometric tools, long and validated questionnaires that mental health specialists and experts can use to quantify mental health so to speak and qualitative studies, too, that engage more with kind of the patient's experiences as they provide it.

Q And is one method preferable to another?

A I think it just depends on the context in which you are asking that question. But as a physician who cares for all adolescents and transgender adolescents, I find all of that evidence quite compelling.

Q Based on your review of available literature, what do the studies of youth on puberty blockers generally report?

A Generally, my assessment of those studies is a stability and psychosocial functioning of stability mental health that puberty pausing medication is in use.

Q So stability. Why is stability important? What are the benefits of having stability in mental health?

A Well, if somebody is on a downward trajectory or suffering, then, to put a pause on that suffering is incredibly therapeutic and profound.

In practice, that pause or that stability in mental health functioning allows that young person to engage productively with a mental health provider so that they can understand themselves. They can clarify their goals. They can learn more about that gender identity. They can participate in more discussion with their family members, and they can just function.

Q Now based on your review of available literature, what do studies on youth hormone therapy generally report?

A Youth who receive cross-sex hormones achieve appearance congruence, meaning that their -- I'm sorry. I already defined that. I shouldn't defined that again. I'm sorry. They achieve appearance congruence, which is the mediator and the causal pathway between treatment for gender dysphoria and mental health benefits. So any time you're kind of studying the effective intervention, it's important to understand the things that mediate that relationship and appearance

congruence is just that.

Q What evidence or studies support the fact that hormone therapy has beneficial impact on mental health for adolescents?

A What studies? There are many. I could summarize maybe three of the ones that I consider to be the most impactful.

So Dr. Chen and her colleagues published an article in the New England Journal of Medicine. It was the largest study to date with four different treatment cites throughout the country. The largest number of participants followed over two years. And what it demonstrated is that transgender adolescents experience relief in their mental health issues when their appearance aligns with their internal sense of self.

Diana Tordoff and her clients out of Seattle demonstrated that by controlling for psychotherapy, mental health support, that there is an independent effect of gender-forming medications on mental health and independent positive effect.

And then, Laura Kuper's group of the Genesis Clinic in Dallas, Texas, also conducted a study of their patients and they showed that gender-forming care leads to reduction in body dissatisfaction, which is a little bit of a double negative -- but I'm just trying to stay true to the literature itself -- and that reduction body satisfaction are also associated with improvement in mental health.

Q Now, can you talk about the harms that manifest if one waits until adulthood to take hormone therapy as medically necessary.

A Yes. In Dr. Shumer's testimony he described what happens when unwanted puberty progresses. That individual ends up with secondary sex characteristics that they did not want. The distress of that accumulates over time. These are people who are trying to live their lives. You know, they are trying to perform in school. Develop, you know, friendships, a sense of self, and it's really hard to do that when there's extreme distress going on.

What we also know, based on clinical research, is that adults who had desired care as adolescents but didn't receive it, report a higher rate of past years suicidality and we also know that even amongst older-presenting adolescents, that they tend to have worse mental health outcomes if they had gender dysphoria throughout their adolescent years than younger-presenting adolescents who received the intervention in a more timely way.

Q And you eluded to studies that support this positive relationships. Can you point to a couple that you are aware of.

A Yes. I think we've covered a few of them. There are, I think, you know, over 16 studies now that demonstrate the mental health benefits of care, but the ones that I just

described, the Seattle Study, the Dallas Study and then the Multicenter Study published in the New England Journal all demonstrate the mental health benefits of this care.

Q Now Defendants' experts in their declarations criticize the reports that you rely on in your own declaration.

What is your response to that?

A Well, you know, I -- I take my position as a clinical researcher, someone who is trained in evidence-based medicine and somebody who provides care for individuals every day very seriously. I was really surprised to see in their declarations inconsistent thresholds of what's acceptable for various types of evidence.

These experts seem to need the highest threshold of evidence possible to evaluate the benefits of care but the assertions that they make in seeking to describe knowledge about gender dysphoria are grounded in logic that wouldn't make it onto the evidence pyramid.

In the Chen Study that we've discussed, two participants committed suicide, and that finding has been used to claim that gender-affirming care causes suicide. And that's not even correlational. It's speculation. So I think the inconsistencies in their use of evidence-based medicine are quite concerning.

Q And in a more specific way, Dr. Cantor opines that some of the studies you cited are deficient because those studies

do not present a causal relationship between the medical care and the outcome.

What's your response to that allegation?

A Well, in some ways, you know, you could swap out certain words or certain phrases. I mean, again, I feel like he's saying these studies didn't use Randomized Controlled Trial methodology. That's just a fact. We know that. You don't need Randomized Controlled Trials to uncover causal links. So I would say that that's far too simplistic of an assertion and the best evidence that we have suggests a causal link between medical treatment of gender dysphoria and improved well being of transgender youth.

Q Dr. Laidlaw and Dr. Cantor disagree with you that WPATH is a term of authoritativeness in the medical community. So, for example, they did bring up the Cass Report in the UK for this assertion that these medications are not safe.

What is your understanding of what that Cass Report says?

A You know, the Cass Report is -- it's a document that provides internal findings. As I understand it, it's based on the N-I-C-E the NICE reviews that were performed by unknown authors affiliated with the National Health Service. It's a little unusual for systematic reviews to not report their authorship. That's a level of transparency that's generally accepted but these reviews weren't really published in a journal or anything, so they weren't put to a peer-review

test.

I would not take those reviews, which informed Dr. Cass's report over the standards of care produced by hundreds of experts in this field who are wildly regarded in the international medical community.

Q Dr. Laidlaw characterizes this interim report as one that led to the closing down of a clinic in the UK.

What do you make of that assessment?

A Well, that clinic wasn't closed and then care was ceased, but those clinical services were redirected to satellite cites throughout the United Kingdom to better serve their patients' needs. If the only gender clinic in the United States was in Georgia, it would be impossible to serve the vast majority of the people.

The wait list for receiving care was close to five years. So if you need to seek care when you are 11 years old, that's an intolerable time to wait. So I think that the situation that led to the production of her report and the redirection of services was really quite grave and like nothing that we've seen here in the United States.

Q In the countries cited by Dr. Laidlaw and Dr. Cantor in the declarations when they talk about care in their various healthcare systems, which one of them has banned hormone therapy for adolescents?

A None of them have banned care.

Q Are you aware of the Georgia law S.B. 140 and what it says?
A Yes, I am.
Q Defense experts talked a lot about this need for more research in this field of medicine, the area of inquiry. How would this law affect the ability of doctors and researchers in Georgia to conduct clinical research on the specific area?
A I know very well through my professional connections and my training and my formative years that this state and specifically this city is home to a great deal of intellectual talent and expertise and that a lot of compassionate care is provided, which serves as excellent substrate for real-world clinical research. The enactment of S.B. 140 would dismantle that completely.

MS. WEAVER: Thank you, doctor.

I have no further questions.

CROSS-EXAMINATION

BY MR. HARRIS:
Q Good morning, Dr. McNamara.
A Hi there.
Q Just a couple preliminary questions.

When were you retained by the Plaintiffs in this case?
A I think it was in June. Probably early June.
Q And you were retained to prepare a report and offer testimony, if called here; correct?

A Correct.
Q And you're being paid $400 an hour for your work with the Plaintiffs?
A Yes.
Q And what's a ballpark estimate of how much time you spent writing the report you put in?
A You know, it's so -- I have been preparing for this so much that I haven't even had a chance to think about it. Any number I give you I hope is not binding, but maybe like 10 to 15 hours, and then editing more and -- let's just say 15 hours.
Q Thank you. And about how much time did you spend preparing your testimony in advance of the hearing?
A How many hours?
Q Um-hmm.
A Maybe another 10 to 15, probably. Feels like more.
Q And I see from your report you were retained in the Alabama case. Can you just discuss the nature of your work on that case.
A Yes. I mean the Alabama case, I actually don't know where it is right now. It is hard to follow these things but I prepared an expert report.
Q And were you paid the same there as you were here?
A No. I was a paid a little bit more.
Q Okay. Before we get into some specific things, you

offered some critiques of some of the European evidence and systematic review.

Can you tell us what you think is the single best study supporting the effectiveness of hormone therapy for adolescent?

A I can't tell you a single study. It's not quite like that because in my mind, there's no hierarchy of which is best. I think they all provide -- they all have their strengths and their weaknesses. They all give us information in one area and together as a whole. That's how I view the evidence.

Q Okay. You would view the -- you were in the courtroom while Dr. Shumer was testifying; right?

A Yes.

Q You would agree with me, then, that the five studies that my friend discussed with Dr. Shumer from Europe are part of that whole that's being considered?

A So when you say studies, what are you considering?

Q I asked you. I mean, I asked you to name the single study or published study, whether it's systematic review, an observational study, that you think is the best single study to show the effectiveness of cross-sex hormones for gender dysphoria.

A So that includes systematic reviews?

Q Sure.

A Okay. So --
Q Sorry. So now we are mixing questions. Let me just restate that.
A Sure.
Q Do you consider the studies you heard discussed with Dr. Shumer to be part of what you just described as that whole mix you considered all together to figure out the best answer.
A Can we review what those five studies were?
Q Sure. It's actually -- they are in your binder there Defendants' 1 through 5.
A I have not looked at the binder at all yet.
Q Should be one labeled --
A 1 through 5. Okay. The NICE Review and the Cass Report, the Finnish Health Authority, the Kaltiala Study and the Ludvigsson Systematic Review.
I would not consider the first three to be producing any new findings. So those are the kind of like the government-produced findings. I don't -- I -- I wouldn't count those -- the Kaltiala Study -- the Kaltiala Study isn't an original piece of clinical research and the Ludvigsson Study is a systematic review, so in and of itself, it is kind of an original piece of clinical research.
Q So your answer to that is when you said there's no single piece of evidence that you can look at the universe and weigh them -- so was your answer, yes, you would consider some of

these or all of these as part of that, just to be clear?
A I would consider the fourth and the fifth as original clinical research that should be considered in considering all of the evidence on gender-affirming care, but the three government-produced reports, you know, as -- I am not really in the habit of using government reports from other countries to consider the evidence on care.
Q Okay. Just, one other quick question on this. I think you suggested that you down weighted the Sweden Systematic Review a little bit because some of the searches that were conducted were too old maybe, I think you said. It was not as current as some other things.
A Yeah. There was about a two-year gap between publication and then the timing in which they stopped looking at the literature.
Q Okay. And just to confirm, what was -- do you remember what those dates were? Do you remember what the gap was?
A Well, let's look right here. I think it was November 2021. Do you want me to make sure?
Q Sure. You have got it in front of you.
A Yes. Like they started in 2014 and searched databases until November 9th of 2021.
Q And would you concede then that the Endocrine Society 2017 Guidelines have the same critique? So I think those were published in 2017?

A Yeah. The Endocrine Society is definitely due to review their guidelines.

Q Okay. Moving on to some other topics.

So according to WPATH, transgender individuals may consider a range of identities and elements of gender presentations when they're exploring their gender identity.

Do you agree with that?

A Yes.

Q Okay. And do you agree that people may spend some time in a gender identity or presentation before they discover it does not feel comfortable and later adapt it or shift it to an earlier identity or presentation?

Do you agree with that?

A I'm sorry. Just read it one more time.

Q Sorry.

A It was long.

Q I don't want to make you keep flipping through things.

THE COURT: I'm asking you to slow down just a little bit. I can see our court reporter struggling here.

MR. HARRIS: Sorry.

BY MR. HARRIS:

Q People may spend some time in a gender identity or presentation before they discover it does not feel comfortable and later adapt it or shift to an earlier identity or presentation.

Do you agree with that?
A Yes. That can sometimes happen.
Q A little bit more on your background.
You said in your report that you provide full spectrum care for youth experiencing gender dysphoria.
Is that correct?
A I provide full spectrum care for adolescents and that includes youths who experience gender dysphoria.
Q Do you prescribe hormone therapy, puberty blockers, or hormones?
A I don't prescribe puberty blockers. I will review patients prescriptions for hormones, if they have received care in a gender clinic.
I take care of patients up to about age 25. My position at Yale is a little unique. I'm kind of their generalized medicine person and we have a gender clinic. So if I meet somebody who is experiencing gender dysphoria for the first time, I'll refer them there for comprehensive services.
Q Okay. So would it be your position that only a endocrinologist would initially prescribe puberty blockers or hormones?
A No. Adolescent medicine physicians do that, too.
Q Is there a reason you don't sort of do it in the first instance?
A Well, yeah. I only have 20 minutes per appointment and I

see a lot of other things. I see a lot of complex trauma, sexual reproduction health needs, sports medicine issues, other menstrual concerns, dermatology. I could go on and on but it's just where my institution needs me is to provide general adolescent care.

Q What percentage of your practice would you say is devoted to specifically treating gender dysphoria?

A You know, I provide -- let me back that up. I couldn't give you a specific percentage. I would say that right now, I probably have about 10 to 15 youths who are experiencing gender dysphoria in my care. I'm not prescribing their hormones or specifically managing their gender dysphoria. That's happening in a multidisciplinary clinic. But they also have other health needs. You know, they might also have Type 1 diabetes or ADHD or really bad acne or need menstrual suppression. So that's what I do for them now.

Q Okay. But -- and you are here testifying as an expert and you are competent to testify about the treatment of adolescents with gender dysphoria. It's a large portion of your report; is that right?

A Yes, absolutely.

Q Okay. So under what you describe as the standard of care for gender dysphoria, what's the minimum age at which a child should receive cross-sex hormones?

A There is no hard and fast age.

Q Okay. What's the youngest age you have seen a child given cross-sex hormones?
A Fifteen, I think.
Q All right. Do you think that standard of practitioners in the area, that would be about the minimum age you would expect to see that?
A Not necessarily. I don't -- I'm not sure I have intimate acknowledge of the specific lower age that my colleagues have prescribed sex hormones at.
Q In Paragraph 44 of your report, you use the phrase psychological maturity. You say cross-sex hormones should only be given once the provider is ensured the child has the psychological maturity to proceed.
What do you mean by that?
A Well, that is a determination that's made by a mental health specialist who is competent in areas of gender. And it's made after a series of discussions between parents, the patient, and their providers. And at that point, we, you know, the clinicians endeavor to make sure the patient is concrete in their identity, and that they understand the risks and the benefits and the effects of care.
Q And you agree with Dr. Shumer, I assume, that giving opposite sex hormones based on someone's natal sex will induce physical characteristics that are different from what otherwise would have developed?

A Yes.
Q Please -- I promise I won't do this that much -- if you will turn to Plaintiffs' Exhibit's 9, which is the WPATH Standards, Appendix C which is on Page 254.
A 9?
Q Yeah. There are two binders. It might be in the other one.
A And then you said what?
Q Appendix C, Page 254.
A Is it 254.
Q Yes, it is.
A Okay.
Q Great. And I just want to confirm, do you agree Table 1 lists --
A Oh, I'm sorry. I'm sorry. I am so sorry. Okay. Yes, okay.
Q Okay. Do you agree that Table 1 in this document lists the expected physical changes we'd expect to see from gender-affirming hormones?
A Yes, I do.
Q And you agree that that would be the expected, you know, that would be what one would expect from a testosterone-based regimen on top and estrogen-based regimen on the bottom?
A Yeah. Any variety of these, yes.
Q Okay. Now take a look at Table 2. And Table 2 says

Risks Associated With Gender-Affirming Hormone Therapy; right?
A Yes.
Q And what -- tell me what is the bold things -- what do the bold risks indicate?
A Under estrogen-based regimen of venous thromboembolism infertility and under the testosterone polycythemia infertility.
Q And what does it mean -- it says here bolded items are clinically significant. Tell me what that means.
A I would need to see if -- I don't know if they have like a footnote where they describe what clinically significant means. I would assume they are likely or deserved particular consideration.
Q Okay. Tell me what a venous thromboembolism is.
A It's a blood clot.
Q Is that dangerous?
A Yes.
Q Tell me what polycythemia is.
A It's the overproduction of red blood cells or it's a higher level of blood cells than the normal range.
Q Okay. So I just want to confirm -- so seeing the physical changes in the risks, so it's your opinion that a 15 year old could have the psychological maturity to consent to treatments with this risk profile?
A Yes. You know, it's maturity. I do believe so, yes.

Q Okay. And it's also your opinion that someone of that age would have the psychological maturity to consent to interventions that could jeopardize their fertility?
A I do want to just introduce a little caveat. Adolescents or minors do not consent to treatment. They assent. They have medical decision makers that provide consent. So psychological maturity to understand, to assent, but they're joined by a medical decision maker who's often a parent or a guardian who has the kind of like highest expected ability to understand the risks and that benefits.
Q Okay. So because -- do you agree that, for example, on fertility, a 15 year old may not have fully thought through potential future things, like ability to have children? That's often not on a 15 year old's mind; right?
A Sometimes it is. I wouldn't say unilaterally. I have talked to many transgender adolescents who have been very thoughtful about their family-planning goals and taken steps to preserve their fertility or, you know, considered other ways that they might wish to become parents. So I wouldn't make a black and white determination like that.
Q Okay. WPATH -- we don't have to turn, but we can if you need the full quote. WPATH -- the same document we were reading says that there are only quote preliminary results from retrospective studies evaluating transgender adults in the decisions they made when they were young regarding the

consequences of medical-affirming treatment on reproductive capacity.

Does that sound accurate that they say preliminary results?

A Preliminary -- yes. There are new studies coming out all the time. But retrospective studies, as you mentioned, would be the only way you go back and ask people.

Q Georgia, like many other states, generally with very tiny exceptions, says that 18 is the minimum age for marriage.

Do you think children under the age of 18 can assent to marriage with parental approval?

A I remember being a medical student at CHOA Egleston Hospital and thinking through some of these things and being very kind of dialed into Georgia's laws and nuances of, you know, cultural backgrounds of the diverse patients that got health care there.

Specifically regarding marriage, I don't think that's for a doctor to make a determination on.

Q So you don't have an opinion about whether a 15 year old could assent with parental approval to marriage?

A As a physician, I do not.

Q Okay. Okay. So you mentioned a few minutes ago about parents, which I'd like to go back to. You say many times in your report, you know, they are in there. We'll need to look at one.

In Paragraph 34 of your report you say informed consent by parents is a foundational practice of adolescent medicine.

So you are of the view that hormones would be given without parental consent?

A That's correct.

Q Does that reflect the standard of care as you understand it that there would be parental involvement and consent on a decision like that?

A For cross-sex hormones, yes.

Q Then I'm confused about some of the WPATH statements.

Again, we can turn, if you would like, but WPATH says there should be parent/guardian involvement, unless their involvement is determined to be harmful or unnecessary.

Can you help me understand what that means.

A Where you are looking?

Q Sure. It's S114 right in the heading that carries over to 115. The bold heading that carries over from 114 to 115. Take a look at that.

A We recommend health care professionals prescribe sex hormone treatment regimens as part of gender-affirming treatment in eligible transgender and gender diverse adolescents who are at least Tanner stage 2, with parent/guardian involvement unless their involvement is determined to be harmful or unnecessary to the adolescent.

Well, I think that's a stipulation for protecting

adolescents who are emancipated or adolescents who are being physically harmed by their parents sometimes not infrequently with all adolescents but at least in my experience, you know, some child protective services body may be involved for various reasons. So I think they have to put that caveat in there.

Q Okay. So I want to be clear about your view. Your view in a scenario where say it's 15 year old who wants hormones and the parents say -- you know, completely on the same page with each other. We think the risks of this are just too great and, you know, you have got to wait until you are 18, that's a decision that you would respect and support?

A Absolutely. That patient would not receive care. I mean they wouldn't receive medical aspects of gender-affirming care. They would receive ongoing psychological support. It would be incredibly important to maintain the therapeutic relationship with that family. To maintain connections to the patient to ensure that they're safe and as well as possible. That is not an infrequent experience of mine.

Q Okay. And I guess I'll ask you one more question about the psychological maturity.

Do you think children at the age of 18 have the maturity to assent to surgical procedures for gender transitions?

A In some cases, yes. In some cases their dysphoria is so profound and not adequately relieved with other medical

treatment. I have known adolescents who have received gender-affirming surgery before the age of 18 and tremendously benefited from them.

Q So do you think there are any gender-affirming medical interventions, surgical, medical or otherwise, that shouldn't be done on children under 18?

A Do I think there are any interventions that shouldn't be done on adolescents?

Q Adolescents, right.

A That is a question I -- no. I don't think that there is any hard and fast rules to that. I really -- I really do place stock in WPATH and not having hard and fast age limits because every individual is different. Every individual's experience with gender dysphoria is different and every individual needs different things.

Q Okay. And just going back to some of the studies for a bit. I know you addressed some of the European studies. Do you -- when you said you are familiar with those, do you have any reason to believe any of those studies were motivated by anti-trans animus or bias?

A I don't know and I'm not the right person to ask because I haven't done thorough inventory of the conflicts of interest or the potential thereof. It is a little concerning or it raises a red flag for bias that the NICE reviews from the UK don't have authors. We don't know who wrote them, so we can't

ascertain what their credentials might be.
Q And you -- I know you testified before about the difference between clinical guidelines and studies or research. If there were clinical guidelines that recommended treatments with minimal benefits and serious risks, would you think doctors should follow that guideline, just as a general matter?
A I can't answer that question. It's so hypothetical and so broad, I need --
Q I mean --
A It's impossible.
Q Do you think clinical guidelines should be followed in all circumstances?
A I can't think of a specific area in which a clinical guideline is not trustworthy or it's unreliable. The processes by which these guidelines are developed are so robust that I'm just kind of running through my head what the guidelines I'm familiar with.
Q Well, let's --
THE COURT: Please don't interrupt. Please don't interrupt the witness.
BY MR. HARRIS:
Q Please finish.
A That I can't think of one that I know of. When we begin to think about hypotheticals, I simply can't do it without

concrete terms in reality. I'm not trying to not answer your question. It's just not how I think about medicine.

Q Okay. Or let's say if there were a guideline from ten years ago that was still out there and other research had come in since then that questioned the effectiveness or safety of that intervention, that might be a reason not to follow it; right?

A It might be a reason for that organization to issue a new set of guidelines and I don't think it's quite as black and white, so I don't follow those guidelines. It's a lot more nuance than that. You know, we use these guidelines and we also use new and best available evidence simultaneously.

The scenario you are describing is fairly unusual, at least to my knowledge. Of guidelines I use, I think, you know, they're updated with enough frequency, such that that has not happened and you may be eluding to the Endocrine Society Guidelines last updated about seven years ago.

Q I was just asking a hypothetical.

A Okay.

Q I have one last question. It's a longer passage so I'll just have you to turn to Page S46 of the WPATH Guidelines which is Plaintiffs' 9.

A Okay.

Q Would you just read the two sentences beginning with the word despite starting in the middle of the top paragraph.

A I'm so sorry. What page is it?
Q I'm sorry S46. I might have said that wrong.
A You know you didn't -- I honestly might need glasses, S46.
Q And then the top left paragraph right in the middle there is the word despite and the two sentences starting right there. Actually would you mind reading them for the court reporter.
A I would, if I could find it. S46, top left.
Q About halfway through that paragraph.
A Oh, it's in the middle of the paragraph. The paragraph starts at the time of this chapter's writing.
Q The paragraph above that. The half one.
A Oh, there we go. Okay. Thank you. Thank you.
Despite the slowly growing body of evidence supporting the effectiveness of early medical intervention, the number of studies is still low, and there are few outcome studies that follow youth into adulthood. Therefore, a systematic review regarding outcomes of treatment in adolescents is not possible. A short narrative review is provided instead.
Q Okay. And the question I have is do you agree with WPATH that the number of studies is still low and there are few outcomes study that follow youth into adulthood?
A Yes. I agree with that.
MR. HARRIS: Thank you, doctor.

THE COURT: I have one question for our witness. And this was a lingering question from the direct examine and I'll let you ask any follow up, if you would like after this.

BY THE COURT:

Q So one of your critique as I understand it of the expert declarations that were submitted by the State is that -- and correct me if I have gotten this wrong or this mischaracterizes any of your testimony -- but I think you said the State's experts were endorsing inconsistent thresholds as far as acceptable medical evidence in this sphere. And as I understand it, your testimony was that they were endorsing a high threshold as far as the effectiveness of hormone therapy for the treatment of gender dysphoria and a lower threshold as to certain other factors that they discussed. I did not grasp what those other factors were, so I was wondering if you might expand on that.

A Yes. So the example I gave was one of the State's experts made a statement in his declaration that in a study where two suicides among transgender youth were observed, that that indicates that gender-affirming care causes suicide. That statement is grounded in -- it relies on the causal evidence that doesn't exist.

If you think about the evidence pyramid as it was presented by the Defendants' experts, they want to live in the systematic review top of the pyramid to assess all the

evidence of benefits, but when they try to describe other phenomenon that exist in clinical research in this actual care, they make a lot of speculation statements that are grounded in no evidence.

There's been no evidence that demonstrates that gender-affirming care causes suicide. And to read a statement like that is fundamentally unscientific and wrong. There are other statements that are made in those declarations which I can recall for you, if you would like, but it's kind of one strong example of a significant inconsistency.

THE COURT: I appreciate the clarification.

BY MR. HARRIS:

Q So that same study that you mentioned I just want to confirm is it your position that Chen does not establish causation on a causal link between transitioning medications and well being?

A They establish a causal link between transitioning medications and appearance congruence and well being. A causal link is not a hundred percent causation but they're building the pathway for how you get from medical intervention to improved mental health. They showed with really sound statistical methods that this mediator of exposure to outcome is appearance congruence.

Q Okay. Do you acknowledge -- I'm going to read it. We don't have to turn there. You can tell me if I misword it.

Chen says, finally, our study lacked a comparison group which limits our ability to establish causation?

A It's limited but it is there.

MR. HARRIS: Thank you.

THE COURT: Redirect?

MS. WEAVER: Just a few questions, Your Honor.

REDIRECT EXAMINATION

BY MS. WEAVER:

Q Dr. McNamara, you were asked on cross about the table in the WPATH Guidelines stating the risks of receiving hormone therapy treatment like blood clots. They are possible risks; is that correct?

A Blood clots are possible risk. The GnRH agonist example would be -- so I mean as Dr. Shumer mentioned when an individual receives estrogen, they do so in a way that's meant to mimic the physiologic state of a cisgender woman and every woman is at a high risk of blood clots, a higher risks than males and a higher risk than an aggregated risk of all people. So we are very careful about counseling and then that's a really important thing to highlight because there are certain medical conditions that can be co-occurring that would raise one's risk or, you know, certain behavior habits like smoking cigarettes.

Q And do all medical treatments have possible risks?

A Absolutely, yes. I spend a lot of time counseling around

the general risks of all treatments.
Q You were asked about a minor's ability to assent.
Can an adolescent assent to risks to receiving care, if those risks outweighs negative mental health experiences, such as suicidal ideation, depression, anxiety?
A Yes, absolutely.
Q And minors cannot receive medical care without consent of a parent or a guardian?
A A parent guardian or other medical decision maker, correct.
MS. WEAVER: I have no further questions, unless you have additional questions.
THE COURT: I do not.
Are you all finished with this doctor?
All right. Thank you. You are excused.
Counsel, it is 12:30. I think I'd like to break for lunch at this point. Why don't we -- I'm trying to think we have two more witnesses to hear from today; is that right?
MR. BRADSHAW: Yes, Your Honor.
THE COURT: Let's take an hour for lunch and we'll be back at -- slightly less than an hour. We will be back at 1:30.
(Luncheon recess was taken.)
THE COURT: I understand we will hear from Defendants' witness.

REPORTERS CERTIFICATE

I do hereby certify that the foregoing pages are a true and correct transcript of the proceedings taken down by me in the case aforesaid.

This, the 28th day of August 2023.

/s/Melissa C. Brock RPR, RMR
OFFICIAL COURT REPORTER

Gender Dysphoria

In this chapter, there is one overarching diagnosis of gender dysphoria, with separate developmentally appropriate criteria sets for children and for adolescents and adults. The area of sex and gender is highly controversial and has led to a proliferation of terms whose meanings vary over time and within and between disciplines. An additional source of confusion is that in English "sex" connotes both male/female and sexuality. This chapter employs constructs and terms as they are widely used by clinicians from various disciplines with specialization in treating gender dysphoria. In this chapter, *sex* and *sexual* refer to the biological indicators of male and female (understood in the context of reproductive capacity), such as in sex chromosomes, gonads, sex hormones, and nonambiguous internal and external genitalia. Disorders of sex development or differences of sex development (DSDs) included the historical terms *hermaphroditism* and *pseudohermaphroditism*. DSDs include somatic intersex conditions such as congenital development of ambiguous genitalia (e.g., clitoromegaly, micropenis), congenital disjunction of internal and external sex anatomy (e.g., complete androgen insensitivity syndrome), incomplete development of sex anatomy (e.g., gonadal agenesis), sex chromosome anomalies (e.g., Turner syndrome; Klinefelter syndrome), or disorders of gonadal development (e.g., ovotestes).

Gender is used to denote the public, sociocultural (and usually legally recognized) lived role as boy or girl, man or woman, or other gender. Biological factors are seen as contributing, in interaction with social and psychological factors, to gender development. *Gender assignment* refers to the assignment as male or female. This occurs usually at birth based on phenotypic sex and, thereby, yields the *birth-assigned gender*, historically referred to as "biological sex" or, more recently, "natal gender." *Birth-assigned sex* is often used interchangeably with birth-assigned gender. The terms *assigned sex* and *assigned gender* encompass birth-assigned sex/gender but also include gender/sex assignments and reassignments made after birth but during infancy or early childhood, usually in the case of intersex conditions. *Gender-atypical* refers to somatic features or behaviors that are not typical (in a statistical sense) of individuals with the same assigned gender in a given society and historical era; *gender-nonconforming*, *gender variant*, and *gender diverse* are alternative nondiagnostic terms. *Gender reassignment* denotes an official (and sometimes legal) change of gender. *Gender-affirming treatments* are medical procedures (hormones or surgeries or both) that aim to align an individual's physical characteristics with their *experienced gender*. *Gender identity* is a category of social identity and refers to an individual's identification as male, female, some category in between (i.e., *gender fluid*), or a category other than male or female (i.e., *gender neutral*). There has been a proliferation of gender identities in recent years. *Gender dysphoria* as a general descriptive term refers to the distress that may accompany the incongruence between one's experienced or expressed gender and one's assigned gender. However, it is more specifically defined when used as a diagnostic category. It does not refer to distress related to stigma, a distinct although possibly co-occurring source of distress. *Transgender* refers to the broad spectrum of individuals whose gender identity is different from their birth-assigned gender. *Cisgender* describes individuals whose gender expression is congruent with their birth-assigned gender (also *transgender*). *Transsexual*, a historic term, denotes an individual who seeks, is undergoing

or has undergone a social transition from male to female or female to male, which in many but not all, cases also involves a somatic transition by gender-affirming hormone treatment and genital, breast, or other gender-affirming surgery (historically referred to as *sex reassignment surgery*).

Although not all individuals will experience distress from incongruence, many are distressed if the desired physical interventions using hormones and/or surgery are not available. The current term is more descriptive than the previous DSM-IV term *gender identity disorder* and focuses on dysphoria as the clinical problem, not identity per se.

Gender Dysphoria

Diagnostic Criteria

Gender Dysphoria in Children — F64.2

A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least 6 months' duration, as manifested by at least six of the following (one of which must be Criterion A1):

1. A strong desire to be of the other gender or an insistence that one is the other gender (or some alternative gender different from one's assigned gender).
2. In boys (assigned gender), a strong preference for cross-dressing or simulating female attire; or in girls (assigned gender), a strong preference for wearing only typical masculine clothing and a strong resistance to the wearing of typical feminine clothing.
3. A strong preference for cross-gender roles in make-believe play or fantasy play.
4. A strong preference for the toys, games, or activities stereotypically used or engaged in by the other gender.
5. A strong preference for playmates of the other gender.
6. In boys (assigned gender), a strong rejection of typically masculine toys, games, and activities and a strong avoidance of rough-and-tumble play; or in girls (assigned gender), a strong rejection of typically feminine toys, games, and activities.
7. A strong dislike of one's sexual anatomy.
8. A strong desire for the primary and/or secondary sex characteristics that match one's experienced gender.

B. The condition is associated with clinically significant distress or impairment in social, school, or other important areas of functioning.

Specify if:

With a disorder/difference of sex development (e.g., a congenital adrenogenital disorder such as E25.0 congenital adrenal hyperplasia or E34.50 androgen insensitivity syndrome).

Coding note: Code the disorder/difference of sex development as well as gender dysphoria.

Gender Dysphoria in Adolescents and Adults — F64.0

A. A marked incongruence between one's experienced/expressed gender and assigned gender, of at least 6 months' duration, as manifested by at least two of the following:

1. A marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics (or in young adolescents, the anticipated secondary sex characteristics).

2. A strong desire to be rid of one's primary and/or secondary sex characteristics because of a marked incongruence with one's experienced/expressed gender (or in young adolescents, a desire to prevent the development of the anticipated secondary sex characteristics).
3. A strong desire for the primary and/or secondary sex characteristics of the other gender.
4. A strong desire to be of the other gender (or some alternative gender different from one's assigned gender).
5. A strong desire to be treated as the other gender (or some alternative gender different from one's assigned gender).
6. A strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender).

B. The condition is associated with clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

With a disorder/difference of sex development (e.g., a congenital adrenogenital disorder such as E25.0 congenital adrenal hyperplasia or E34.50 androgen insensitivity syndrome).

Coding note: Code the disorder/difference of sex development as well as gender dysphoria.

Specify if:

Posttransition: The individual has transitioned to full-time living in the experienced gender (with or without legalization of gender change) and has undergone (or is preparing to have) at least one gender-affirming medical procedure or treatment regimen—namely, regular gender-affirming hormone treatment or gender reassignment surgery confirming the experienced gender (e.g., breast augmentation surgery and/or vulvovaginoplasty in an individual assigned male at birth; transmasculine chest surgery and/or phalloplasty or metoidioplasty in an individual assigned female at birth).

Specifiers

The specifier "with a disorder/difference of sex development" should be used in the context of individuals who have a specific and codable disorder/difference of sex development documented in their medical record.

The "posttransition" specifier may be used in the context of continuing treatment procedures that serve to support the new gender assignment.

Diagnostic Features

Individuals with gender dysphoria have a marked incongruence between the gender to which they have been assigned (usually based on phenotypic sex at birth, referred to as *birth-assigned gender*) and their experienced/expressed gender. This discrepancy is the core component of the diagnosis. There must also be evidence of distress about this incongruence. Experienced gender may include alternative gender identities beyond binary stereotypes. Consequently, distress may involve not only the experience that the individual is a male or female gender other than the one assigned at birth but also an experience that the individual is an intermediate or alternative gender that differs from the individual's birth-assigned gender.

Gender dysphoria manifests itself differently in different age groups. The following examples may be less prominent in children raised in surroundings with fewer gender stereotypes.

Prepubertal individuals assigned female at birth with gender dysphoria may express a marked, persistent feeling or conviction that they are a boy, express aversion to the idea of

being a girl, or assert they will grow up to be a man. They often prefer boys' clothing and hairstyles, may be perceived by strangers as boys, and may ask to be called by a boy's name. Sometimes they display intense negative reactions to parental attempts to have them wear dresses or other feminine attire. Some may refuse to attend school or social events where such clothes are required. These children may demonstrate marked gender nonconformity in role-playing, dreams, gender-typed play and toy preferences, styles, mannerisms, fantasies, and peer preferences. Contact sports, rough-and-tumble play, traditional boyhood games, and boys as playmates are most often preferred. They show little interest in stereotypically feminine toys (e.g., dolls) or activities (e.g., feminine dress-up or role-play). Occasionally, they refuse to urinate in a sitting position. Some may express a desire to have a penis or claim to have a penis or that they will grow one when older. They may also state that they do not want to develop breasts or menstruate.

Prepubertal individuals assigned male at birth with gender dysphoria may express a marked, persistent feeling or conviction that they are a girl or assert that they will grow up to be a woman. They may express aversion to the idea of being a boy. They often prefer dressing in girls' or women's clothes or may improvise clothing from available materials (e.g., using towels, aprons, and scarves for long hair or skirts). These children may demonstrate marked gender nonconformity in gender-typed play and toy preferences, styles, mannerisms, and peer preferences. They may role-play female figures (e.g., playing "mother") and may be intensely interested in female fantasy figures. Traditional feminine activities, stereotypical games, and pastimes (e.g., "playing house"; drawing feminine pictures; watching television or videos of favorite female characters) may be preferred. Stereotypical female-type dolls (e.g., Barbie) may be favorite toys, and girls are their preferred playmates. They avoid rough-and-tumble play and have little interest in stereotypically masculine toys (e.g., cars, trucks). They may state that they find their penis or testes disgusting, that they wish them removed, or that they have, or wish to have, a vagina.

Increasingly, parents are presenting to specialized clinics after their child with gender dysphoria has already socially transitioned.

As the onset of puberty for individuals assigned female at birth is somewhere between ages 9 and 13, and between 11 and 14 for individuals assigned male at birth, their symptoms and concerns may arise in a developmental phase somewhere between childhood and adolescence. As secondary sex characteristics of younger adolescents are not yet fully developed, these individuals may not state dislike of them, but they may be markedly distressed by imminent physical changes.

In adolescents and adults with gender dysphoria, the discrepancy between experienced gender and physical sex characteristics is often, but not always, accompanied by a desire to be rid of primary and/or secondary sex characteristics and/or a strong desire to acquire some primary and/or secondary sex characteristics of another gender. To varying degrees, older adolescents and adults with gender dysphoria may adopt the behavior, clothing, and mannerisms of their experienced gender. They feel uncomfortable being regarded by others, or functioning in society, as members of their assigned gender. Some adults and adolescents may have a strong desire to be of a different gender and treated as such, and they may have an inner certainty to feel and respond as their experienced gender without seeking medical treatment to alter body characteristics. They may find other ways to resolve the incongruence between experienced/expressed and assigned gender by partially living in the desired role or by adopting a gender role neither conventionally male nor conventionally female.

Associated Features

When visible signs of puberty develop, individuals assigned male at birth may shave their facial, body, and leg hair at the first signs of growth. They sometimes bind their genitals to

walk with a stoop, or use loose sweaters to make breasts less visible. Increasingly, adolescents request, or may obtain without medical prescription and supervision, drugs that suppress production of gonadal steroids (e.g., gonadotropin-releasing hormone [GnRH] agonists) or that block gonadal hormone actions (e.g., spironolactone). Clinically referred adolescents often want hormone treatment and many also wish for gender-affirming surgery. Adolescents living in an accepting environment may openly express the desire to be and be treated as their experienced gender and dress partly or completely as their experienced gender, have a hairstyle typical of their experienced gender, preferentially seek friendships with peers of another gender, and/or adopt a new first name consistent with their experienced gender. Older adolescents, when sexually active, often do not show or allow partners to touch their sexual organs. For adults with an aversion toward their genitals, sexual activity is constrained by the preference that their genitals not be seen or touched by their partners. Not infrequently, adults may seek hormone treatment (sometimes without medical prescription and supervision) and gender-affirming surgery. Others are satisfied with either hormone treatment or surgery alone, or without any gender-affirming medical treatment.

In children, adolescents, and adults with gender dysphoria, an overrepresentation of autism spectrum traits has been observed. Also, individuals with autism spectrum disorder are more likely to exhibit gender diversity.

Adolescents and adults with gender dysphoria before gender-affirming treatment and legal gender change are at increased risk for mental health problems including suicidal ideation, suicide attempts, and suicides. After gender reassignment, adjustment may vary, and suicide risk and mental health problems may persist.

In prepubertal children, increasing age is associated with having more behavioral or emotional problems; this is related to the increasing nonacceptance of gender-nonconforming behavior by others. Children and adolescents who feel supported and accepted in their gender nonconformity may show less or even no psychological problems.

Prevalence

There are no large-scale population studies of gender dysphoria. Based on gender-affirming treatment–seeking populations, the prevalence for gender dysphoria diagnosis across populations has been assessed to be less than 1/1,000 (i.e., <0.1%) for both individuals assigned male at birth and individuals assigned female at birth. Because many adults with gender dysphoria do not seek care at specialty treatment programs, prevalence rates are likely underestimates. Prevalence estimates based on surveys of self-reporting general population samples in the United States and Europe suggest higher numbers, although varied methods of assessment make comparisons difficult across studies. Self-identification as transgender ranges from 0.5% to 0.6%; experiencing oneself as having an incongruent gender identity ranges from 0.6% to 1.1%; feeling that one is a person of a different sex ranges from 2.1% to 2.6%; and the desire to undergo medical treatment ranges from 0.2% to 0.6%.

Development and Course

Because expression of gender dysphoria varies with age, there are separate criteria sets for children versus those for adolescents and adults. Criteria for children are defined in a more concrete, behavioral manner than those for adolescents and adults. Young children are less likely than older children, adolescents, and adults to express extreme and persistent anatomic dysphoria. In adolescents and adults, incongruence between experienced gender and assigned gender is a central feature of the diagnosis. Factors related to distress and impairment also vary with age. A very young child may show signs of distress (e.g., intense crying) only when parents tell the child that he or she is "really" not a member of another gender but only "desires" to be. Distress may not be manifest in social environments supportive of the child's gender nonconformity and may emerge only if there is parental/

social interference with the child's gender variance. In adolescents and adults, distress may manifest because of strong incongruence between experienced gender and birth-assigned gender. Such distress may, however, be mitigated by supportive environments and knowledge that biomedical treatments exist to reduce incongruence. Impairment (e.g., school refusal, development of depression, anxiety, peer and behavioral problems, and substance abuse) may be a correlate of gender dysphoria.

Gender dysphoria without a disorder of sex development. For clinic-referred children studied in Canada and the Netherlands, onset of gender-nonconforming behaviors is usually between ages 2 and 4 years. This corresponds to the developmental time period in which most children begin expressing gendered behaviors and interests. For some preschool-age children, both marked, persistent gender-atypical behaviors and the expressed desire to be another gender may be present, or labeling themselves as a member of another gender may occur. In other cases, the gender expression appears later, usually at entry into elementary school. Children may sometimes express discomfort with their sexual anatomy or will state the desire to have a sexual anatomy corresponding to their experienced gender ("anatomic dysphoria"). Expressions of anatomic dysphoria become more common as children with gender dysphoria approach and anticipate puberty.

No general population studies exist of adolescent or adult outcomes of childhood gender variance. Some prepubescent children expressing a desire to be another gender will not seek gender-affirming somatic treatments when they reach puberty. They frequently report nonheterosexual orientations and frequently marked gender-nonconforming behavior, although not necessarily a transgender identity in adolescence/young adulthood. Some children with gender dysphoria in childhood that remits in adolescence may experience a recurrence in adulthood.

In individuals assigned male at birth, studies from North America and the Netherlands found persistence ranged from 2% to 39%. In individuals assigned female at birth, persistence ranged from 12% to 50%. Persistence of gender dysphoria is modestly correlated with dimensional measures of severity ascertained at the time of a childhood baseline assessment. Early social transition may also be a factor in persistence of gender dysphoria in adolescence.

Studies have shown a high incidence of sexual attraction to those of the individual's birth-assigned gender, regardless of the trajectory of the prepubescent child's gender dysphoria. For individuals whose gender dysphoria continues into adolescence and beyond, most self-identify as heterosexual. In those who no longer have gender dysphoria by the time of adolescence, a majority self-identify as gay, lesbian, or bisexual.

Two broad trajectories have been described for development of gender dysphoria in individuals who identify as either male or female.

As opposed to gender-nonconforming children, individuals with *prepubertal-onset gender dysphoria* have symptoms that meet diagnostic criteria for gender dysphoria in childhood. The dysphoria can continue into adolescence and adulthood; alternatively, some individuals go through a period in which the gender dysphoria either desists or is denied. At such times, these individuals may self-identify as being gay or lesbian. Some may identify as heterosexual and cisgender. However, it is possible that some of these individuals may experience a recurrence of gender dysphoria later in life.

Regardless of whether the individual's gender dysphoria persists or desists at a later date, either the onset of puberty or the realization that puberty will begin with development of secondary sex characteristics can prompt distressing feelings of gender incongruence that can exacerbate the individual's gender dysphoria.

The early/prepubertal-onset group often present for clinical, gender-affirming care during childhood, during adolescence, or in young adulthood. This may reflect a more intense gender dysphoria compared with individuals with late/postpubertal-onset gender dysphoria, whose distress may be more variable and less intense.

Late-onset or pubertal/postpubertal-onset gender dysphoria occurs around puberty or even much later in life. Some of these individuals report having had a desire to be of another gender in childhood that was not expressed verbally to others or had gender-nonconforming behavior that did not meet full criteria for gender dysphoria in childhood. Others have no recollection of any signs of childhood gender dysphoria. Parents of individuals with gender dysphoria of pubertal/postpubertal-onset often report surprise, as they saw no signs of gender dysphoria during childhood.

Gender dysphoria in association with a disorder of sex development. Individuals with DSDs who require early medical intervention or decisions about gender assignment come to clinical attention at an early age. Depending on the condition, they may have been gonadectomized (often because of risk of future malignancy) before puberty so that administration of exogenous hormones is part of routine care to induce puberty. Infertility is common whether due to the condition itself or to gonadectomy, and genital surgery may have been done in infancy or childhood with the intent of affirming the assigned gender to both the affected individual and caregivers.

Affected individuals may exhibit gender-nonconforming behavior starting in early childhood in a manner that is predictable depending on the specific DSD syndrome and the gender assignment, and thresholds for supporting social and medical gender transition in minors have traditionally been much lower for those with compared to those without DSDs. As individuals with some DSD syndromes become aware of their condition and medical history, many experience uncertainty about their gender, as opposed to developing a firm conviction that they are of another gender. The proportion who develop gender dysphoria and progress to gender transition varies markedly depending on the particular syndrome and gender assignment.

Risk and Prognostic Factors

Temperamental. Gender-variant behavior among individuals with prepubertal-onset gender dysphoria can develop in early preschool age. Studies suggest that a greater intensity of gender nonconformity and an older age at presentation make persistence of gender dysphoria into adolescence and adulthood more likely. A predisposing factor under consideration, especially in individuals with postpubertal-onset gender dysphoria (adolescence, adulthood), includes history of transvestism that may develop into autogynephilia (i.e., sexual arousal associated with the thought or image of oneself as a woman).

Environmental. Individuals assigned male at birth with gender dysphoria without a DSD (in both childhood and adolescence) more commonly have older brothers when compared with cisgender males.

Genetic and physiological. For individuals with gender dysphoria without a DSD, some genetic contribution is suggested by evidence for (weak) familiality of gender dysphoria among nontwin siblings, increased concordance for gender dysphoria in monozygotic compared with dizygotic same-sex twins, and some degree of heritability of gender dysphoria. Research suggests that gender dysphoria has a polygenetic basis involving interactions of several genes and polymorphisms that may affect in utero sexual differentiation of the brain, contributing to gender dysphoria in individuals assigned male at birth.

As to endocrine findings in individuals with gender dysphoria, no endogenous systemic abnormalities in sex-hormone levels have been found in 46,XY individuals, whereas there appear to be increased androgen levels (in the range found in hirsute women but far below normal male levels) in 46,XX individuals. Overall, current evidence is insufficient to label gender dysphoria without a DSD as a form of intersexuality limited to the central nervous system.

In gender dysphoria associated with a DSD, the likelihood of later gender dysphoria is increased if prenatal production and utilization (via receptor sensitivity) of androgens are grossly variant relative to what is usually seen in individuals with the same assigned gen-

der. Examples include 46,XY individuals with a history of normal male prenatal hormone milieu but inborn nonhormonal genital defects (as in cloacal bladder exstrophy or penile agenesis) and who have been assigned to the female gender. The likelihood of gender dysphoria is further enhanced by additional, prolonged, highly gender-variant postnatal androgen exposure with somatic virilization as may occur in female-raised and noncastrated 46,XY individuals with 5-alpha reductase-2 deficiency or 17-beta-hydroxysteroid dehydrogenase-3 deficiency or in female-raised 46,XX individuals with classical congenital adrenal hyperplasia with prolonged periods of nonadherence to glucocorticoid replacement therapy. However, the prenatal androgen milieu is more closely related to gendered behavior than to gender identity. Many individuals with DSDs and markedly gender-variant behavior do not develop gender dysphoria. Thus, gender-nonconforming behavior by itself should not be interpreted as an indicator of current or future gender dysphoria. There appears to be a higher rate of gender dysphoria and patient-initiated gender change from assigned female to male than from assigned male to female in individuals prenatally exposed to a full complement of masculinizing hormonal influences.

Culture-Related Diagnostic Issues

Individuals with gender dysphoria have been reported across many countries and cultural contexts around the world. The equivalent of gender dysphoria has also been reported in individuals living in cultural contexts with institutionalized gender identity categories other than men/boys or women/girls that sanction gender nonconforming development. These include India, Sri Lanka, Myanmar, Oman, Samoa, Thailand, and Indigenous Peoples of North America. It is unclear however, in such cultural contexts, whether the diagnostic criteria for gender dysphoria would be met with these individuals.

The prevalence of coexisting mental health problems differs among cultures; these differences may also be related to differences in attitudes toward gender nonconformity in children, adolescents, and adults. However, also in some non-Western cultures, anxiety has been found to be relatively common in individuals with gender dysphoria, even in cultures with accepting attitudes toward gender-variant behavior.

Sex- and Gender-Related Diagnostic Issues

Sex differences in rate of referrals to specialty clinics vary by age group. In children, sex ratios of individuals assigned male at birth to individuals assigned female at birth range from 1.25:1 to 4.3:1. Studies show increasing numbers of children and adolescents presenting to specialty clinics, presentation at younger ages, more frequent early social transition, and a shift to a greater number of individuals assigned female at birth in adolescents and young adults than individuals assigned male at birth. In adults, estimates generally suggest more individuals assigned male at birth seek gender-affirming treatment, with ratios ranging from 1:1 to 6.1:1 in most studies in the United States and Europe.

Association With Suicidal Thoughts or Behavior

Rates of suicidality and suicide attempts for transgender individuals are reported to range from 30% to 80%, with risk factors including past maltreatment, gender victimization, depression, substance abuse, and younger age. Transgender adolescents referred to gender clinics have substantially higher rates of suicidal thoughts and behaviors when compared with nonreferred adolescents. Prior to receiving gender-affirming treatment and legal gender reassignment, adolescents and adults with gender dysphoria are at increased risk for suicidal thoughts and suicide attempts. After gender-affirming treatment, adjustment varies, and while improvement in coexisting symptoms is often seen, some individuals continue to experience prominent anxiety and affective symptoms and remain at increased risk for suicide

A study of 572 children referred for gender identity concerns in Canada and several comparison groups (siblings, other referred children, and nonreferred children) largely from other high-income countries found that gender-referred children were 8.6 times more likely to self-harm or attempt suicide than comparison children, even after adjustment for overall behavior and peer relationship problems, and particularly in the second half of childhood. Among adolescents, the highest rate of suicide attempt is among transgender young men, followed by those defining themselves as neither male nor female.

Functional Consequences of Gender Dysphoria

Gender nonconformity may appear at all ages after the first 2–3 years of childhood and may interfere with daily activities. In older children, gender nonconformity may affect peer relationships and may lead to isolation from peer groups and to distress. Many children experience teasing and harassment or pressure to dress in attire associated with their birth-assigned sex, especially when growing up in a nonsupportive and nonaccepting environment. Also in adolescents and adults, the distress resulting from gender incongruence often interferes with daily activities. Relationship difficulties, including sexual relationship problems, are common, and functioning at school or at work may be impaired. Gender dysphoria is associated with high levels of stigmatization, discrimination, and victimization, leading to negative self-concept, increased rates of depression, suicidality, and other mental disorder co-occurrence, school dropout, and economic marginalization, including unemployment, with attendant social and mental health risks, especially in individuals who lack family or social support. In addition, these individuals' access to health services and mental health services may be impeded by structural barriers, such as institutional discomfort about, inexperience with, or hostility toward working with this patient population.

Differential Diagnosis

Nonconformity to gender roles. Gender dysphoria should be distinguished from simple nonconformity to stereotypical gender role behavior by the strong desire to be of another gender than the assigned one and by the extent and pervasiveness of gender-variant activities and interests. The diagnosis is not meant to merely describe nonconformity to stereotypical gender role behavior (e.g., "tomboyism" in girls, "girly-boy" behavior in boys, occasional cross-dressing in adult men). Given the increased openness of gender-diverse expressions by individuals across the entire range of the transgender spectrum, it is important that the clinical diagnosis be limited to those individuals whose distress and impairment meet the specified criteria.

Transvestic disorder. Transvestic disorder is diagnosed in heterosexual (or bisexual) adolescent and adult males (rarely in females) for whom women's clothing generates sexual excitement and causes distress and/or impairment without drawing their assigned gender into question. It is occasionally accompanied by gender dysphoria. An individual with transvestic disorder who also has clinically significant gender dysphoria can be given both diagnoses. In some cases of postpubertal-onset gender dysphoria in individuals assigned male at birth who are attracted to women, cross-dressing with sexual excitement is a precursor to the diagnosis of gender dysphoria.

Body dysmorphic disorder. An individual with body dysmorphic disorder focuses on the alteration or removal of a specific body part because it is perceived as abnormally formed, not because it represents a repudiated assigned gender. When an individual's presentation meets criteria for both gender dysphoria and body dysmorphic disorder, both diagnoses can be given. Individuals wishing to have a healthy limb amputated (termed by some *body integrity identity disorder*) because it makes them feel more "complete" usually do not wish to change gender, but rather desire to live as an amputee or a disabled person.

Autism spectrum disorder. In individuals with autism spectrum disorder, diagnosing gender dysphoria can be challenging. It can be difficult to differentiate potential co-occurring

gender dysphoria from an autistic preoccupation because of the concrete and rigid thinking around gender roles and/or poor understanding of social relationships characteristic of autism spectrum disorder.

Schizophrenia and other psychotic disorders. In schizophrenia, there may rarely be delusions of belonging to some other gender. In the absence of psychotic symptoms, insistence by an individual with gender dysphoria that he or she is another gender is not considered a delusion. Schizophrenia (or other psychotic disorders) and gender dysphoria may co-occur. Gender-themed delusions may occur in up to 20% of individuals with schizophrenia. They can usually be differentiated from gender dysphoria by their bizarre content and by waxing and waning with remissions and exacerbations of psychotic episodes.

Other clinical presentations. Some individuals with an emasculinization desire who develop an alternative, nonmale/nonfemale gender identity do have a presentation that meets criteria for gender dysphoria. However, some males seek genital surgery for either aesthetic reasons or to remove psychological effects of androgens without changing male identity; in these cases, the criteria for gender dysphoria are not met.

Comorbidity

Clinically referred children with gender dysphoria show elevated levels of anxiety, disruptive, impulse-control, and depressive disorders. Autism spectrum disorder is more prevalent in clinically referred adolescents and adults with gender dysphoria than in the general population. Clinically referred adolescents and adults with gender dysphoria often have high rates of associated mental disorders, with anxiety and depressive disorders being the most common. Individuals who have experienced harassment and violence may also develop posttraumatic stress disorder.

Other Specified Gender Dysphoria

F64.8

This category applies to presentations in which symptoms characteristic of gender dysphoria that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for gender dysphoria. The other specified gender dysphoria category is used in situations in which the clinician chooses to communicate the specific reason that the presentation does not meet the criteria for gender dysphoria. This is done by recording "other specified gender dysphoria" followed by the specific reason (e.g., "brief gender dysphoria," in which symptoms meet full criteria for gender dysphoria but the duration is less than the required 6 months).

Unspecified Gender Dysphoria

F64.9

This category applies to presentations in which symptoms characteristic of gender dysphoria that cause clinically significant distress or impairment in social, occupational, or other important areas of functioning predominate but do not meet the full criteria for gender dysphoria. The unspecified gender dysphoria category is used in situations in which the clinician chooses *not* to specify the reason that the criteria are not met for gender dysphoria, and includes presentations in which there is insufficient information to make a more specific diagnosis.

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF ALABAMA
NORTHERN DIVISION

BRIANNA BOE, individually and on behalf of her minor son, MICHAEL BOE; *et al.*, Plaintiffs, and UNITED STATES OF AMERICA, Plaintiff-Intervenor, v. STEVE MARSHALL, in his official capacity as Attorney General of the State of Alabama; *et al.*, Defendants.	Case No. 2:22-cv-00184-LCB-CWB Honorable Liles C. Burke

PLAINTIFFS' DISCLOSURE OF EXPERT REPORT OF MEREDITHE MCNAMARA, MD MSc

I am a board-certified pediatrician and adolescent medicine physician. I received an MD and Master of Science in Clinical Research from Emory University. I completed pediatrics residency training at the University of Chicago and fellowship training in adolescent medicine at the University of Illinois-Chicago. I am an Assistant Professor of Pediatrics at the Yale School of Medicine. I provide full spectrum clinical care to youth aged 12-25 years, which includes youth experiencing gender dysphoria. A copy of my curriculum vitae is provided with this report. In addition to the materials cited herein and attached, I reviewed declarations made by Drs. James Cantor, Michael Laidlaw, Quentin Van Meter, Paul Hruz, Patrick Hunter, and Dianna Kenny filed by the Defendants in earlier proceedings.

I. Transitioning medications are safe and effective treatment for gender dysphoria in adolescents and are administered in accordance with evidence-based clinical practice guidelines.

Gender dysphoria is a recognized condition[1] for which medical treatment can be essential. The evidence shows that standard medical treatments for gender dysphoria improve mental health outcomes, including reducing rates of suicidal ideation and suicide attempts. Standard treatments for transgender adolescents with gender dysphoria may include, if determined to be medically necessary for a given individual, gonadotropin-releasing hormone agonists – also known as puberty blockers, and hormone therapies such as estrogen or testosterone. Collectively, these medications are known as "transitioning medications".

A. International and national medical consensus supports the treatment of gender dysphoria and recommends use of standards of care from WPATH and clinical practice guidelines from the Endocrine Society.

Individuals with gender dysphoria seek medical care at a wide variety of ages. In the earliest phase of treatment, the treatment plan is typically non-medical, and care consists of using the individual's gender-appropriate pronouns, psychosocial evaluation and support, and education about the next stages of transition if medically necessary. After these initial visits, adolescents in the second, third or fourth stages of puberty may have a medical need for temporary use of puberty blockers to stall distressing physical change. Use of hormone therapies such as estrogen or testosterone is an established practice in older transgender adolescents experiencing gender dysphoria.

Leading guidelines for the medical treatment of transgender children and adolescents are those published by World Professional Association for Transgender Health (WPATH) and by the Endocrine Society. WPATH is a leading international organization of scientists and other professionals, which has issued standards of care for transgender adults and children since 1979.[2] Several revisions have been made as scientific evidence drives changes in standards. The current version, WPATH Standards of Care Version 8, is viewed as authoritative in the medical

[1] American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders (DSM-5), Fifth edition*. 2013.

[2] The current version is WPATH (2022). According to WPATH, the first seven versions were published in 1979, 1980, 1981, 1990, 1998, 2001, and 2012.

community and is widely consulted by physicians and other clinicians. The Endocrine Society is the leading international organization of endocrinologists, i.e., physicians specializing in the study and treatment of the human endocrine system, including hormonal treatment. In 2009, with updates in 2017, the Endocrine Society issued clinical practice guidelines for the treatment of gender dysphoria.[3]

The National Academy of Medicine, formerly the Institute of Medicine, and one of the three parts of the National Academy of Science, is the premier American organization for establishing objective, authoritative and scientific answers to important questions of our time pertaining to human health.[4] Members of this non-governmental, non-profit organization are internationally recognized scholars with distinguished careers in all fields of medicine. The National Academy of Medicine has established standards for how clinical guidelines should be developed. Consistent with these standards, guidelines from WPATH and the Endocrine Society are based on rigorous, structured, and iterative processes that include a committee of scientific experts and external peer review by additional experts. All relevant research is collated and discussed in committee meetings by experts. The guidelines are based on careful reviews of the scientific literature and are revised periodically to reflect scientific developments. These longstanding clinical practice guidelines have been used by clinicians for decades. WPATH issued its initial guidelines in 1979 and updated them in 1980, 1981, 1990, 1998, 2001, 2012, and 2022. The eighth version, entitled "Standards of Care 8" was released in September 2022, and it incorporates systematic literature reviews and ample opportunities for peer review and revision.[5] Over one hundred experts in gender dysphoria and essential medical treatment for gender dysphoria are credited in its authorship.

Reflecting this scientific and medical consensus, medical care for gender dysphoria has been confirmed as standard of care by relevant medical organization in the United States, including the American Academy of Pediatrics, the American Psychological Association, and the American Academy of Child and Adolescent Psychiatry among others.[6] The World Health Organization in the 11th edition of the International Classification of Disease recognizes the importance of transgender health care as essential medical care in appropriate cases.

As set forth above, I have reviewed the declarations made by Drs. James Cantor, Michael K. Laidlaw, Quentin L. Van Meter, Paul W. Hruz, Patrick Hunter and Dianna Kenny, submitted by Defendants in Opposition to Plaintiffs' Motion for Preliminary Injunction in May of 2022

---

[3] Endocrine Society (2017).

[4] Institute of Medicine 2011. *Clinical Practice Guidelines We Can Trust.* Washington, DC: The National Academies Press. https://doi.org/10.17226/13058.

[5] See World Professional Association for Transgender Health (WPATH), Methodology for the Development of Standards of Care 8 (Soc 8), at https://www.wpath.org/soc8/Methodology.

[6] Jason Rafferty, Committee on Psychosocial Aspects of Child and Family Health; Committee on Adolescence; Section on Lesbian, Gay, Bisexual, and Transgender Health and Wellness, Ensuring Comprehensive Care and Support for Transgender and Gender-Diverse Children and Adolescents, 142(4) Pediatrics E20182162 (2018); American Psychological Association, Guidelines for Psychological Practice with Transgender and Gender Nonconforming People, 70(9) American Psychologist 832-64 (2015); Stewart L. Adelson, Practice Parameter on Gay, Lesbian, or Bisexual Sexual Orientation, Gender Nonconformity, and Gender Discordance in Children and Adolescents, 51(9) J. Am. Acad. Child & Adolescent Psychiatry, 957-974 (2012).

(collectively "Defendants' Expert PI Declarations").[7] I also am generally familiar with arguments that are made by opponents of the use of transitioning medications to treat transgender youth with gender dysphoria. Based upon my review of the Defendants' PI Expert Declarations, I understand that Defendants may rely on Dahlen et al[8] and incorrectly claim that the WPATH and Endocrine Society guidelines have "not been recommended for use." The cited systematic review, however, does not conclude that the WPATH and Endocrine Society guidelines should not be used, nor does the Dahlen study assess the scientific evidence base of the WPATH guidelines. Rather, the Dahlen study uses the AGREE (Appraisal of Guidelines for Research and Evaluation) method[9] to evaluate the clarity, presentation, and user-friendliness of the clinical practice guidelines (along with several other clinical practice guidelines), not the underlying science. The foundational paper for the AGREE method states expressly that AGREE "does not assess the clinical content of the guideline nor the quality of evidence that underpins the recommendations."[10]

I also anticipate that Defendants may criticize the Endocrine Society Guidelines for using "low quality" or "very low quality" evidence, without regard for how these technical terms are specifically defined by the GRADE (Grading of Recommendation Assessment, Development and Evaluation) method, which is an evidence-based assessment method that the Endocrine Society uses for its guidelines.[11] The Endocrine Society has produced recommendations based on "low quality" or "very low quality" evidence in a number of areas: in various aspects of the care of primary adrenal insufficiency, central hypopituitarism, pheochromocytoma and paragangliomia, and several others.[12]

---

[7] I do not know who Defendants may designate as expert witnesses for trial, nor do I know the complete list of reference materials upon which they may rely. When I quote a statement by one of Defendants' Expert PI Declarations, my criticisms are not limited to that expert, but instead would apply to any individual making such claims. I have not reviewed Defendants' expert reports at this time, and I reserve the right to amend my report to rebut assertions made by Defendants' experts in their reports.

[8] Dahlen S, Connolly D, Arif I, et al International clinical practice guidelines for gender minority/trans people: systematic review and quality assessment BMJ Open 2021;11:e048943. doi: 10.1136/bmjopen-2021-048943.

[9] https://www.agreetrust.org/wp-content/uploads/2013/10/AGREE-II-Users-Manual-and-23-item-Instrument_2009_UPDATE_2013.pdf.

[10] Brouwers M, Kho ME, Browman GP, Cluzeau F, feder G, Fervers B, Hanna S, Makarski J on behalf of the AGREE Next Steps Consortium. AGREE II: Advancing guideline development, reporting and evaluation in healthcare. Can Med Assoc J. Dec 2010, 182:E839-842; doi: 10.1503/cmaj.090449.

[11] Schünemann H, Brożek J, Guyatt G, Oxman A, editors. GRADE handbook for grading quality of evidence and strength of recommendations. Updated October 2013. The GRADE Working Group, 2013. Available from guidelinedevelopment.org/handbook.

[12] Stefan R. Bornstein, Bruno Allolio, Wiebke Arlt, Andreas Barthel, Andrew Don-Wauchope, Gary D. Hammer, Eystein S. Husebye, Deborah P. Merke, M. Hassan Murad, Constantine A. Stratakis, David J. Torpy, Diagnosis and Treatment of Primary Adrenal Insufficiency: An Endocrine Society Clinical Practice Guideline, The Journal of Clinical Endocrinology & Metabolism, Volume 101, Issue 2, 1 February 2016, Pages 364–389, https://doi.org/10.1210/jc.2015-1710; Maria Fleseriu, Ibrahim A. Hashim, Niki Karavitaki, Shlomo Melmed, M. Hassan Murad, Roberto Salvatori, Mary H. Samuels, Hormonal Replacement in Hypopituitarism in Adults: An Endocrine Society Clinical Practice Guideline, The Journal of Clinical Endocrinology & Metabolism, Volume 101, Issue 11, 1 November 2016, Pages 3888–3921, https://doi.org/10.1210/jc.2016-2118; Jacques W. M. Lenders, Quan-Yang Duh, Graeme Eisenhofer, Anne-Paule Gimenez-Roqueplo, Stefan K. G. Grebe, Mohammad Hassan Murad, Mitsuhide Naruse, Karel Pacak, William F. Young, Jr, Pheochromocytoma and Paraganglioma: An Endocrine Society Clinical Practice Guideline, The Journal of Clinical Endocrinology & Metabolism, Volume 99, Issue 6, 1

The WPATH Standards of Care and Endocrine Society are based on the best available science and expert professional consensus. Other medical organizations such as the American Academy of Pediatrics, the American Psychological Association, and the American Academy of Child and Adolescent Psychiatry have endorsed these standards of care.

Defendants may attempt to distort these standards of care by falsely claiming that they support or permit treatment "on demand." As explained further below, that is patently false. In fact, these standards require careful assessment at all stages of treatment, from diagnosis to the prescription of transitioning medications if appropriate for an individual youth.

B. **Clinical practice guidelines endorse transitioning medications when medically necessary and after a consultative, informative process with an interdisciplinary team that includes mental health providers, physicians, and parents or guardians.**

A key feature of both the WPATH Standards of Care and the Endocrine Society Clinical Practice Guidelines is the central role of mental health professionals in assessing gender dysphoria and appropriateness of certain modes of medical treatment from a developmentally and psychologically-informed standpoint. The Endocrine Society notes, for example, that, "because of the psychological vulnerability of many individuals with [gender dysphoria], it is important that mental health care is available before, during, and sometimes also after transitioning."[13] WPATH provides extensive guidance on how to provide psychosocial support to youth experiencing gender dysphoria, as well as a definition of what constitutes a properly trained mental health professional.

WPATH and Endocrine Society standards recommend an individualized and staged process for interventions that considers the unique presentation of gender dysphoria in the individual and takes their medical history and psychological functioning into account. Social transition, puberty blockers, and hormonal treatment may be used in stages, and not all transgender adolescents with gender dysphoria undergo each treatment.[14] Decisions regarding treatment are centered upon patient needs and assent, and made with authorization by legal guardians, with expert guidance from an interdisciplinary team of physicians, psychologists, and others. WPATH, for example, expressly states that, "[b]efore any physical interventions are considered for adolescents, extensive exploration of psychological, family, and social issues should be undertaken …. The duration of this exploration may vary considerably depending on the complexity of the situation."[15]

WPATH and Endocrine Society standards recommend puberty-suppressing medications (GnRH agonist treatment) only for adolescents who have begun puberty and with guardrails to ensure that medication is medically necessary. Moreover, adolescents must give informed assent, and their parents or guardians must give informed consent to treatment.

June 2014, Pages 1915–1942, https://doi.org/10.1210/jc.2014-1498. See generally, https://www.endocrine.org/clinical-practice-guidelines.

[13] Endocrine Society (2017).

[14] WPATH (2012), p. 18; Endocrine Society (2017) (Guidelines 2.1 and 2.2).

[15] WPATH (2012), p. 16.

For puberty-suppressing medications, both WPATH and the Endocrine Society standards require the participation of a qualified mental health practitioner, who confirms that the adolescent has demonstrated a long-lasting and intense pattern of gender dysphoria, and that any coexisting psychological, medical, or social problems that could interfere with treatment have been addressed, so that the adolescent's situation and functioning are stable enough to start treatment. The guidelines also require informed assent by adolescents and (if under the age of majority) informed consent by their parents or guardians, and they require the involvement of a physician medically trained in gender-affirming treatment to ensure that puberty-blocking medication is warranted, that puberty has begun in the adolescent patient, and that there are no medical contraindications to puberty-blocking medication.

For those adolescents with gender dysphoria for whom progression to hormone therapy is medically indicated, WPATH and the Endocrine Society require additional counseling regarding the possible fertility effects of hormone therapy. In addition to parental consent, the guidelines require that a mental health practitioner confirm that the adolescent has sufficient mental capacity to evaluate the benefits and risks of treatment.

Informed consent (by parents) and assent (by adolescents) is a foundational practice of adolescent medicine. Virtually any medical treatment confers benefits and potential risks, and the goal of the process prescribed by WPATH and the Endocrine Society is to ensure that treatment for gender dysphoria is medically necessary and likely to be beneficial, and that parents and youth have expert psychological and medical assistance in weighing benefits and risks.

C. A robust body of scientific literature demonstrates that transitioning medications provide effective treatment for gender dysphoria and improve mental health.

Adolescents undergo a critical period of cognitive and social development between the ages of 11-18. Positive experiences and general wellness during this time carry benefits that impact adolescents well into adulthood. Conversely, untreated and sub-optimally treated mental health issues and traumatic experiences inflict multidimensional harms on adolescents that persist into adulthood. For transgender youth, a careful and factual consideration of the mental health benefits of gender transition care is critical.

A solid body of research has shown that transitioning medications have profound mental-health benefits for adolescents experiencing gender dysphoria.[16] Mental health benefits in this sense refer to a broad range of outcomes, including: (1) improved body satisfaction, (2) psychological functioning, (3) reduced depression, (4) reduced anxiety, (5) reduced eating disorders such as anorexia nervosa and bulimia nervosa, (6) reduced suicidal ideation, (7)

[16]Allen et al. 2019; Green et al. (2022); Connolly MD, Zervos MJ, Barone II CJ, Johnson CC, Joseph CL. The Mental Health of Transgender Youth: Advances in Understanding. Journal of Adolescent Health 2016 Nov;59(5):489-95; Turban et al. 2022; Costa et al. (2015); See also Witcomb GL, Bouman WP, Claes L, Brewin N, Crawford JR, Arcelus J. Levels of depression in transgender people and its predictors: Results of a large matched control study with transgender people accessing clinical services. Journal of Affective Disorders 2018 Aug 1; 235:308-15.

reduced non-suicidal self-injury, and (8) reduced suicide itself. Mental health benefits are studied in a variety of ways, including clinician assessments, youth and parent reporting using validated psychometric tools, and objective data.

Puberty blockers have been shown to have beneficial impacts on mental health for transgender youth experiencing gender dysphoria. Studies have shown that puberty blockers are associated with a decrease in suicidality in adulthood and improved psychosocial functioning.[17] Studies of youth on puberty blockers generally report two types of findings: that quantifiable mental health scores either increase or are stable. Stability in mental health outcomes of interest over the course of a study should be interpreted within a patient-centered perspective – meaning we must consider the impact of the intervention on the individual patient. Stability in mental health, rather than a decline, is profoundly beneficial for the young person who, prior to treatment, experienced distress in part due to distressing physical change, halted by puberty blockers.

Transitioning medications have been shown to reduce suicidality in transgender adolescents when compared to peers with gender dysphoria who did not receive such treatments.[18] Empiric changes in measures of mental health changes are the most positive in studies that assess the effect of exogenous sex hormones such as estrogen and testosterone,[19] likely because these patients are acquiring physical characteristics that align with their gender identity for the first time. The scientific evidence demonstrating the benefits of transitioning medications is substantial.[20]

---

[17] Rew L, Young CC, Monge M, Bogucka R. Review: Puberty blockers for transgender and gender diverse youth – a critical review of the literature. Child and Adolescent Mental Health 2021 Feb;26(1):3-14; de Vries AL, Steensma TD, Doreleijers TA, Cohen-Kettenis PT. Puberty suppression in adolescents with gender identity disorder: a prospective follow-up study. J Sex Med. 2011 Aug;8(8):2276-83.

[18] Tordoff et al., *Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Essential medical treatment for gender dysphoria*, 5(2) JAMA Network Open e220978, at 7 (2022); Sorbara JC, Chiniara LN, Thompson S, Palmert MR. Mental health and timing of gender-affirming care. Pediatrics 2020 Oct 1;146(4):e20193600.

[19] Chen D, Berona J, Chan YM, Ehrensaft D, Garofalo R, Hidalgo MA, Rosenthal SM, Tishelman AC, Olson-Kennedy J. Psychosocial Functioning in Transgender Youth after 2 Years of Hormones. N Engl J Med. 2023 Jan 19;388(3):240-250. doi: 10.1056/NEJMoa2206297. PMID: 36652355.

[20] De Vries AL, Steensma TD, Doreleijers TA, Cohen-Kettenis PT. Puberty suppression in adolescents with gender identity disorder: A prospective follow-up study. The Journal of Sexual Medicine 2011 Aug;8(8):2276-83; De VriesAL, McGuire JK, Steensma TD, Wagenaar EC, Doreleijers TA, Cohen-Kettenis PT. Young adult psychological outcome after puberty suppression and gender reassignment. Pediatrics 2014 Oct;134(4):696-704; Costa R, Dunsford M, Skagerberg E, Holt V, Carmichael P, Colizzi M. Psychological Support, Puberty Suppression, and Psychosocial Functioning in Adolescents with Gender Dysphoria. The Journal of Sexual Medicine 2015 Nov;12(11):2206-14; Allen LR, Watson LB, Egan AM, Moser CN. Well-being and suicidality among transgender youth after gender-affirming hormones. Clinical Practice in Pediatric Psychology 2019 Sept;7(3):302-11; Kaltiala R, Heino E, Tyolajarvi M, Suomalainen L. Adolescent development and psychosocial functioning after starting cross-sex hormones for gender dysphoria. Nordic Journal of Psychiatry 2020 Apr;74(3):213-19; de Lara DL, Rodriguez OP, Flores IC, Masa JLP, Campos- Munoz L, Hernandez MC, Amador JTR. Psychosocial assessment in transgender adolescents. Anales de Pediatria (English Edition) 2020 Jul;93(1):41-48; van der Miesen AI, Steensma TD, de Vries AL, Bos H, Popma A. Psychological Functioning in Transgender Adolescents Before and After Gender-Affirmative Care Compared with Cisgender General Population Peers. Journal of Adolescent Health 2020 Jun;66(6):699-704; Achille C, Taggart T, Eaton NR, Osipoff J, Tafuri K, Lane A, Wilson TA. Longitudinal impact of gender-affirming endocrine intervention on the mental health and well-being of transgender youths: preliminary results. International

Recent research further establishes that transitioning medications produce major benefits to physical and mental health. In a study population of 11,914 transgender and nonbinary youth, Green et al demonstrated the significant mental health benefits of transitioning medications, particularly their impact on reduced depression and suicidal ideation.[21] A 2021 meta-analysis of nine studies found positive outcomes from puberty blockers including "decreased suicidality in adulthood, improved affect and psychological functioning, and improved social life."[22] A 2022 study found that transitioning medications were "associated with 60% lower odds of moderate to severe depressive symptoms and 73% lower odds of self-harm or suicidal thoughts over a 12-month follow-up."[23] A 2020 study found that transitioning medications were associated with "important improvements in body dissatisfaction over the first year of treatment."[24] The 2015 U.S. Transgender Survey of 27,715 adults showed that those who received hormone therapy in adolescence had lower suicidality and severe psychological distress in the month prior to study participation when compared to those who did not did not receive such care in their teenage years.[25] Among children and adolescents, patients who present for gender transition care at later pubertal stages are more likely to require psychoactive medications and are more likely to have

---

Journal of Pediatric Endocrinology 2020;2020:8; Kuper LE, Stewart S, Preston S, Lau M, Lopez X. Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy. Pediatrics 2020 Apr;145(4):e20193006; Turban JL, King D, Carswell JM, Keuroghlian AS. Pubertal Suppression for Transgender Youth and Risk of Suicidal Ideation. Pediatrics 2020 Feb;145(2):e20191725; Carmichael P, Butler G, Masic U, Cole TJ, De Stavola BL, Davidson S, Skageberg EM, Khadr S, Viner RM. Short-term outcomes of pubertal suppression in a selected cohort of 12 to 15 year old young people with persistent gender dysphoria in the UK. PLoS One 2021 Feb 2;16(2):e0243894; Grannis C, Leibowitz SF, Gahn S, Nahata L, Morningstar M, Mattson WI, Chen D, Strang JF, Nelson EE. Testosterone treatment, internalizing symptoms, and body image dissatisfaction in transgender boys. Psychoneuroendocrinology 2021 Oct;132:105358; Hisle-Gorman E, Schvey NA, Adirim TA, Rayne AK, Susi A, Roberts TA, Klein DA. Mental Healthcare Utilization of Transgender Youth Before and After Affirming Treatment. The Journal of Sexual Medicine 2021 Aug;18(8):1444-54; Green AE, DeChants JP, Price MN, Davis CK. Association of Gender-Affirming Hormone Therapy with Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth. Journal of Adolescent Health 2022 Apr;70(4):643-49; Turban JL, King D, Kobe J, Reisner SL, Keuroghlian AS. Access to gender-affirming hormones during adolescence and mental health outcomes among transgender adults. PLoS One 2022 Jan 12;17(1):e0261039 (hereinafter, "Turban et al. 2022"); Tordoff DM, Wanta JW, Collin A, Stephney C, Inwards-Breland DJ, Ahrens K. Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Gender-Affirming Care. JAMA Network Open 2022 Feb 1. Chen D, Berona J, Chan YM, Ehrensaft D, Garofalo R, Hidalgo MA, Rosenthal SM, Tishelman AC, Olson-Kennedy J. Psychosocial Functioning in Transgender Youth after 2 Years of Hormones. N Engl J Med. 2023 Jan 19;388(3):240-250. doi: 10.1056/NEJMoa2206297.

[21] Green AE, DeChants JP, Price MN, Davis CK. Association of Gender-Affirming Hormone Therapy With Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth. J Adolesc Health. 2022 Apr;70(4):643-649. doi: 10.1016/j.jadohealth.2021.10.036. Epub 2021 Dec 14. PMID: 34920935.

[22] Lynn Rew et al., *Review*: *Puberty Blockers for Transgender and Gender Diverse Youth-A Critical Review of the Literature*, 26 Child. Adolesc. Ment. Health 3, 3 (2021).

[23] Tordoff D et al., *Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Essential medical treatment for gender dysphoria*, 5(2) JAMA Network Open e220978, at 7 (2022).

[24] Kuper L et al., *Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy*, 145(4) Pediatrics e20193006, at 7 (2020).

[25] Turban JL, King D, Kobe J, Reisner SL, Keuroghlian AS (2022) Access to gender-affirming hormones during adolescence and mental health outcomes among transgender adults. PLOS ONE 17(1): e0261039. https://doi.org/10.1371/journal.pone.0261039.

considered or attempted suicide than patients who received gender transition care at earlier stages of pubertal development.[26]

Defendants' experts misuse of the term "confounding"

Confounding is a term used in epidemiology, biostatistics, and clinical research to describe the phenomenon by which unmeasured factors may affect the impact of an intervention on the outcome of interest. To control for the effects of a possible confounder, data must be gathered on that confounder and added to statistical analyses designed to address the research question at hand. Defendants' experts have claimed that the mental health improvements observed in studies on transitioning medications are due to confounding, supposing that an undefined type of psychotherapy is the confounder, where the intervention is essential medical treatment for gender dysphoria and the outcomes of interest are various aspects of mental health. Yet, Defendants' experts do not note the purpose for which a study was designed, or the fact that many studies gathered data on participants' engagement in psychotherapy and performed statistical analyses that controlled for confounding.

A critical example of this pertains to how Defendants' experts represent de Vries et al's 2011 and 2014 studies. These studies were designed to investigate the utility of puberty blockers (2011, 2014) and hormone therapy (2014) in transgender youth experiencing gender dysphoria. These investigators had previously been caring for gender dysphoric youth at earlier stages of puberty without use of puberty blockers and noted the high burden of distress. Thus, they hypothesized that puberty blockers, a well-known tool for forestalling distressing physical change that already had established safety and effectiveness in children with central precocious puberty, would help stabilize the mental health of gender dysphoric youth. These studies are recognized for their value in detecting an association between puberty blockers and mental health stability in gender dysphoric youth, and they are followed by several other studies that clarify the dynamics of this association.[27]

The Defendants' experts have claimed that the de Vries studies cannot show benefits because investigators do not control for unmeasured factors such as psychotherapy and other types of support. Yet, the studies were not designed to address a research question pertaining to *causation*, but rather were designed to detect an *association*. Defendants' experts claim that this equals confounding, but no investigator in the de Vries study made the claim that a direct, causal relationship was established by these 2011 or 2014 studies.

Other studies toward which the Defendant's experts have leveled the confounding claim, however, did gather data on participants' engagement in psychotherapy and performed statistical analyses that controlled for this effect – thus, controlling for confounding. For example, in Costa et al (2015) investigators reported several significant differences in the mental health benefits of psychotherapy and puberty blockers vs psychotherapy alone. In reviewing Figure 2 from the

---

[26] Sorbara JC, Chiniara LN, Thompson S, Palmert MR. Mental health and timing of gender-affirming care. Pediatrics 2020 Oct 1;146(4):e20193600.

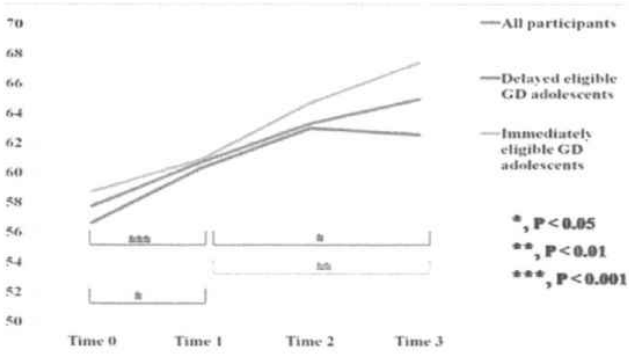
[27] Studies with control groups include Costa 2015, Turban 2020, van der Misen 2020; studies that gathered data on mental health and controlled for it in the analysis include Kuper 2020 and Tordoff 2022.

Costa study (shown below), the investigators note a change in psychosocial functioning between study groups around Time 2 (i.e. 12 months after study onset):

> "[Those] who received only psychological support for the entire duration of the study, had a significantly better psychosocial functioning [compared to their measures at Time 0] after six months of psychological support (Time 0 vs. Time 1, $P = 0.05$). However, despite scoring better at the following evaluations they did not show any further significant improvement in their psychosocial functioning. Also, the delayed eligible group [only received psychological support] continued to score lower than a sample of children/adolescents without observed psychological/psychiatric symptoms, even after 18 months of psychological support (Time 3, $t = 2.0$, $P = 0.04$). On the contrary, the immediately eligible group, who at baseline had a higher, but not significantly different psychosocial functioning than the delayed eligible group, did not show any significant improvement after 6 months of psychological support. However, immediately eligible adolescents [those who received medication] had a significantly higher psychosocial functioning after 12 months of puberty suppression compared with when they had received only psychological support (Time 1 vs. Time 3 $P = 0.001$; Table 2). Also, their CGAS scores after 12 months of puberty suppression (Time 3) coincided almost perfectly with those found in a sample of children/adolescents without observed psychological/psychiatric symptoms ($t = 0.01$, $P = 0.99$)"

This passage from the paper is of critical note. The investigators clearly state that there is indeed a difference in psychosocial functioning between youth with gender dysphoria who did not receive puberty blockers and those who did. This study shows that psychosocial support is associated with improved psychosocial functioning for youth with gender dysphoria, but the impact is limited and that puberty blockers confer additional benefit. While the study did not have a large enough sample size to detect a statistically significant difference between delayed and immediately eligible groups, a clinically different and meaningful improvement was noted in the group who received puberty blockers. Additional studies have established the beneficial impacts of puberty blockers on psychological functioning.[28]

[28] Control groups (Costa 2015, Turban 2020, van der Misen 2020); gathered data on mental health and controlled for it in the analysis (Kuper 2020, Tordoff 2022).



Download : Download full-size image

Figure 2. Gender dysphoria adolescents' psychosocial functioning (CGAS) at baseline, after psychological support, and after puberty suppression

Defendants Experts' statements about suicide

Defendants' experts have previously asserted that essential medical treatment for gender dysphoria causes suicide; however, no study has found a worsening of various mental health measures among recipients of essential medical treatment for gender dysphoria. While Defendants' experts have referenced Dhejne et al. in support of their assertion, that study showed that transgender adults were more likely to attempt and complete suicide when compared to the general population in Sweden between 1973 and 2003 – not that the provision of puberty blockers and hormone therapy in transgender youth with gender dysphoria increases suicide risk. The Dhejne study has no applicability to adolescents. Further, Dhejne et al explicitly acknowledge that their results are not intended to describe the effects of medical aspects of essential medical treatment for gender dysphoria, stating that "*it is impossible to conclude from this data* that gender-affirming procedures were a causative factor in suicidality among transgender individuals."[29]

Defendants' Experts' Misreliance on CMS

In the Expert PI Declarations, Defendants' experts – in particular Dr. Laidlaw -- incorrectly claimed that the Centers for Medicare and Medicaid Services ("CMS") found that essential medical treatment for gender dysphoria has no benefits. Laidlaw claims that this decision implies there is no scientific consensus that essential medical treatment for gender

[29] "It is therefore important to note that the current study is only informative with respect to [transgender] persons' health after sex reassignment; *no inferences can be drawn as to the effectiveness of sex reassignment as a treatment for transsexualism*. In other words, the results should not be interpreted such as sex reassignment per se increases morbidity and mortality. Things might have been even worse without sex reassignment." Dhejne (2011) at 7 (emphasis added).

dysphoria can serve youth with gender dysphoria.[30] Although the CMS did issue a 2016 Decision Memo denying blanket, automatic coverage for surgical treatments for transgender adults, the decision specifically authorizes Medicare and Medicaid providers to cover such surgery on a case-by-case basis.[31] In fact, the 2016 CMS decision marks an expansion of coverage for transgender health care: the Decision Memo followed the 2014 revocation of the CMS's 1989 decision to deny nationwide coverage.[32] Further, the CMS did not reach any negative conclusion on the benefits of essential medical treatment for gender dysphoria for children and adolescents. The CMS reviewed only studies on the outcomes of surgery (not puberty blockers or hormone treatment) for an adult population that is overwhelmingly elderly (over age 65) and has a high prevalence of preexisting medical conditions that can make surgery risky, regardless of its purpose.[33]

D. Transitioning medications have been safely used for decades. Side effects are well known and comparable to side effects of many commonly used medications.

Medications offered for the treatment of gender dysphoria include puberty blockers for those in the second through fourth stages of puberty and cross-sex hormones such as estrogen and testosterone, as well as medications that block testosterone. The dosing and timing of these medications are clearly stated in WPATH and Endocrine Society clinical practice guidelines. Studies in young adults on medications show that the long-term health profiles of transgender individuals are similar to those of the general population.

Puberty blockers

Puberty blockers can be part of a staged approach to essential medical treatment for gender dysphoria in adolescents. By stalling pubertal maturation, adolescents experience a pause in distressing physical change and relief of otherwise intensifying gender dysphoria. During this pause, the adolescent and their family are given time. The adolescent works with a mental health provider to confirm their gender identity. This gives time for medical and mental health evaluation for hormone therapy. Those who continue to identify as transgender will have the

---

[30] Jensen TS, Chin J, Rollins J, Koller E, Gousis L. Decision Memo for Gender Dysphoria and Gender Reassignment Surgery (CAG-00446N). Baltimore (MD): Centers for Medicare and Medicaid Services; 2016 Aug 30 [cited 2022 Feb 18]. Available from: https://www.cms.gov/medicare-coverage-database/view/ncacal-decision-memo.aspx?proposed=N&NCAId=282.

[31] Id. ("We acknowledge that [gender reassignment surgery] may be a reasonable and necessary service for certain beneficiaries with gender dysphoria. The current scientific information is not complete for CMS to make a [national coverage decision] that identifies the precise patient population for whom the service would be reasonable and necessary.")

[32] Id.

[33] The CMS Decision Memo notes that "the Medicare population is different from the general population in age (65 years and older) and/or disability as defined by the Social Security Administration. Due to the biology of aging, older adults may respond to health care treatments differently than younger adults. These differences can be due to, for example, multiple health conditions or co-morbidities, longer duration needed for healing, metabolic variances, and impact of reduced mobility. All of these factors can impact health outcomes. The disabled Medicare population, who are younger than age 65, is different from the general population and typical study populations due to the presence of the causes of disability such as psychiatric disorders, musculoskeletal health issues, and cardiovascular issues." Id.

option to proceed with hormone therapy when their medical and mental health providers determine that treatment is medically appropriate, parents consent to the care, and youth assent. Puberty blockers not only alleviate gender dysphoria in adolescence but can minimize the need for subsequent treatments, including surgery in adulthood. In the event that a teen's cross-gender identification does not persist, they can discontinue the blocker, and natal pubertal maturation will resume. The scientific evidence shows that the hypothalamic-pituitary inhibition caused by puberty blockers is reversible.

Puberty blockers have been prescribed for decades in children with precocious puberty and in adolescents with cancer who need menstrual suppression as they undergo marrow-ablative chemotherapy. A solid body of evidence documents that pubertal progression resumes after discontinuation of the medication.[34] Adolescents receiving puberty blockers for menstrual suppression due to chemotherapy experience resumption of ovulation after the puberty blocker is stopped. In fact, puberty blockers are used in these patients to protect their gonads from toxicity induced by chemotherapy as a means of fertility preservation.[35]

In gender dysphoric youth, as in other populations, puberty blockers can cause reversible slowing of bone density accrual and do reduce one's reproductive potential while in use. It is critical to note that standard protocols do not recommend the use of blockers alone without time limit; patients ultimately either discontinue blockers or add cross-sex hormones. At that point, bone density generally recovers to pre-treatment levels and then progresses at a pace normal for that individual's pubertal stage.[24] Patients and families receive detailed counseling regarding the potential effects of puberty blockers as part of the informed consent process. Furthermore, important safeguards are in place to defend bone density and monitor for change. Calcium supplementation has been shown to protect puberty blocker-treated patients from bone loss,[36]

---

[34] Manasco PK, Pescovitz OH, Feuillan PP, Hench KD, Barnes KM, Jones J, Hill SC, Loriaux DL, Cutler Jr GB. Resumption of puberty after long term luteinizing hormone-releasing hormone agonist treatment of central precocious puberty. *J Clin Endocrinol Metab*. 1988 Aug 1;67(2):368-72; Heger S, Muller M, Ranke M, Schwarz H, Waldhauser F, Partsch C, Sippell WG. Long-term GnRH agonist treatment for female central precocious puberty does not impair reproductive function. *Mol Cell Endocrinol*. 2006 Jul 25;254-255:217-220; Feuillan PP, Jones JV, Barnes K, Oerter-Klein K, Cutler Jr GB. Reproductive Axis after Discontinuation of Gonadotropin-Releasing Hormone Analog Treatment of Girls with Precocious Puberty: Long Term Follow-Up Comparing Girls with Hypothalamic Hamartoma to Those with Idiopathic Precocious Puberty. *J Clin Endocrinol Metab*. 1999 Jan;84(1):44-49; Bertelloni S, Baroncelli GI, Ferdeghini M, Menchini-Fabris F, Saggese G. Final height, gonadal function and bone mineral density of adolescent males with central precocious puberty after therapy with gonadotropin-releasing hormone analogues. *Eur J Pediatr*. 2000 May;159(5):369-74; Bertelloni S, Mul D. Treatment of central precocious puberty by GnRH analogs: long-term outcome in men. *Asian J Androl*. 2008 Jul;10(4):525-34; Luo X, Liang Y, Hou L, Wu W, Ying Y, Ye F. Long-term efficacy and safety of gonadotropin-releasing hormone analog treatment in children with idiopathic central precocious puberty: A systematic review and meta-analysis. *Clin Endocrinol*. 2021 May; 94(5):786-96.

[35] B.Pereyra Pacheco, J.M. Méndez Ribas, G. Milone, I. Fernández, R. Kvicala, T. Mila, A. Di Noto, O.Contreras Ortiz, S. Pavlovsky, Use of GnRH Analogs for Functional Protection of the Ovary and Preservation of Fertility during Cancer Treatment in Adolescents: A Preliminary Report, Gynecologic Oncology, Volume 81, Issue 3,2001, https://doi.org/10.1006/gyno.2001.6181.

[36] Fogelman I. Gonadototropin-releasing hormone agonist and the skeleton. Fertil Steril 1992; 57: 714–724.Antoniazzi F, Bertoldo F, Lauriola S, Sirpresi S, Gasperi E, Zamboni G, Tato L. Prevention of bone demineralization by calcium supplementation in precocious puberty during gonadotropin-releasing hormone agonist treatment. *J Clin Endocrinol Metab*. 1999;84(6):1992-1996). Delemarre-van de Waal HA, Cohen-Kettenis PT. Clinical management of gender identity disorder in adolescents: a protocol on psychological and paediatric

and increased physical activity has been shown to correlate with higher bone mineral density in transgender youth as well.[37] Patients on puberty blockers receive serial bone density measurements via DEXA scans. Similarly, the impact of puberty blockers on fertility is reversible. Individuals may not be able to conceive while puberty blockers are in use, but ovulation and spermatogenesis spontaneously resume when puberty blockers are stopped. Furthermore, individuals are counseled to use contraception to prevent unplanned pregnancy because of its risk, even while on puberty blockers.

Cross-sex hormones

Youth may receive cross-sex hormones such as estrogen and testosterone once they have worked with a mental health provider to confirm the medical need and to ensure that parents are fully informed and that the youth has the psychological maturity to understand the impacts of these treatments.

The effects of cross-sex hormones can be reversible. For transgender men (persons assigned female sex at birth), testosterone treatment can affect ovarian function while on hormone therapy, inhibiting menses in the majority of those on therapy. The evidence also shows that the majority of transgender men who had regular menses before starting testosterone therapy are reported to resume menses if testosterone is discontinued.[38]

The effects of estrogen treatment on testicular histology vary among individuals. Reduced spermatogenesis is common while patients remain on estrogen, but this occurs in varying degrees with some maintaining fertility even while on hormone therapy.[39] Importantly,

---

endocrinology aspects. Eur J Endocrinol. 2006;155:S131-S137. Studies of children treated for precocious puberty found that BMD was normal at final height attainment. Alessandri SB, Pereira F de A, Villela RA, Antonini SRR, Elias PCL, Martinelli Jr CE, de Castro M, Moreira AC, de Paula FJA. Bone mineral density and body composition in girls with idiopathic central precocious puberty before and after treatment with a gonadotropin-releasing hormone agonist. Clinics (Sao Paulo). 2012;67(6):591-96; Antoniazzi F, Zamboni G, Bertoldo F, Lauriola S, Mengarda F, Pietrobelli A, Tato L. Bone mass at final height in precocious puberty after gonadotropin-releasing hormone agonist with and without calcium supplementation. J Clin Endocrinol Metab. 2003 Mar;88(3):1096-1101 (hereinafter, "Antoniazzi et al. (2003)"); Heger S, Partsch CJ, Sippell WG. Long-term outcome after depot gonadotropin-releasing hormone agonist treatment of central precocious puberty: final height, body proportions, body composition, bone mineral density, and reproductive function. J Clin Endocrinol Metab. 1999 Dec;84(12):4583-90; Neely EK, Bachrach LK, Hintz RL, Habiby RL, Slemenda CW, Feezle L, Pescovitz OH. Bone mineral density during treatment of central precocious puberty. J Pediatr. 1995 Nov;127(5):819-22.

[37] Lee, JY, Finlayson, C, Olson-Kennedy J, Garofolo R, Chan YM, Glidden DV, Rosenthal SM, Low Bone Mineral Density in Early Pubertal Transgender/Gender Diverse Youth: Findings from the Trans Youth Care Study, *Journal of the Endocrine Society*, Volume 4, Issue 9, September 2020.

[38] Endocrine Society (2017). Light AD, Obedin-Maliver J, Sevelius JM, Kerns JL. Transgender men who experienced pregnancy after female-to-male gender transitioning. *Obstet Gynecol.* 2014;124(6):1120–1127; Smith KP, Madison CM, Milne NM. Gonadal suppressive and cross-sex hormone therapy for gender dysphoria in adolescents and adults. *Pharmacotherapy.* 2014;34(12):1282–1297.

[39] Schneider F, Kliesch S, Schlatt S, Neuhaus N. Andrology of male -to-female transsexuals: influence of cross-sex hormone therapy on testicular function. Andrology. 2017 Sept;5(5):873-80.

return of spermatogenesis typically occurs in patients who discontinue hormone treatment.[40] In a cohort of patients treated with puberty blockers starting at the onset of pubertal development (Tanner stages 2 and 3) and adding estrogen treatment starting at 16 years of age, histological examination of testicles showed normal-appearing, immature sperm-producing cells in the testes, suggesting those individuals had retained fertility potential.[41] Physicians carefully counsel patients and their parents on the possibility of impairments in fertility should the patient continue on cross-sex hormones. Strategies available to some patients include sperm and oocyte cryopreservation to preserve future fertility.

E. Gender dysphoria is a serious medical condition, and withholding transitioning medications from adolescents with gender dysphoria is harmful.

The American Psychiatric Association explains that

> [T]he term "transgender" refers to a person whose sex assigned at birth (i.e., the sex assigned by a physician at birth, usually based on external genitalia) does not match their gender identity (i.e., one's psychological sense of their gender). Some people who are transgender will experience **"gender dysphoria,"** which refers to psychological distress that results from an incongruence between one's sex assigned at birth and one's gender identity. Though gender dysphoria often begins in childhood, some people may not experience it until after puberty or much later.[42]

In 2013, the American Psychiatric Association released the fifth edition of the DSM-5, the standard reference for the diagnosis of mental health conditions. The DSM-5 recognizes gender dysphoria and sets forth criteria for diagnosis. These criteria include "a marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics" and "a strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender)." To meet diagnostic criteria, an individual must exhibit "clinically significant distress or impairment in social, occupational, or other important areas of functioning."[43]

In other words, transgender individuals who live in a manner that is physically and socially incongruent to their gender identity will predictably experience gender dysphoria – a

---

[40] Schneider F, Neuhaus N, Wistuba J, Zitzmann M, Heß J, Mahler D, van Ahlen H, Schlatt S, Kliesch S. Testicular functions and clinical characterization of patients with gender dysphoria (GD) undergoing sex reassignment surgery (SRS). J Sex Med. 2015 Nov;12(11):2190-2200.

[41] de Nie I, Mulder CL, Meißner A, Schut Y, Holleman EM, van der Sluis WB, Hannema SE, den Heijer M, Huirne J, van Pelt AMM, van Mello NM. Histological study on the influence of puberty suppression and hormonal treatment on developing germ cells in transgender women. Hum Reprod. 2022 Jan 28;37(1):297-308.

[42] What is Gender Dysphoria? [Internet]. Washington, D.C.: American Psychiatric Association; 2020 Nov [cited 2022 Apr 15]. Available from: https://www.psychiatry.org/patients-families/gender-dysphoria/what-is-gender-dysphoria.

[43] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, D.C.: American Psychiatric Association; 2013.

clinically significant psychological distress that can lead to depressed mood and suicidality.[44] Suicidal ideation and attempts have been found to be significantly higher among transgender adolescents who cannot obtain or do not receive essential medical treatment for gender dysphoria than among their non-transgender peers. The harm of not providing essential medical treatment for gender dysphoria is well documented.[45] Untreated gender dysphoria can also lead to disordered eating. Patients may engage in unsafe eating behaviors (e.g., food restriction or purging) as a body-affirming tool and an effort to align their bodies with their gender identity. These behaviors can impair physical health and development.[46] Further, there is data that shows that waiting until adulthood to offer hormone therapy to transgender adolescents is associated with past-year suicidal ideation, past-month severe psychological distress, past-month binge drinking and illicit drug use.[47] The scientific consensus shows that denying essential medical treatment for gender dysphoria harms transgender people and puts their lives at risk.

I have cared for many patients who have disclosed gender dysphoria to me in later adolescence or early adulthood and report, during the time in which they were suffering from gender dysphoria but not receiving treatment, they reported poor psychosocial functioning, social isolation, worsening mental health, restrictive eating patterns and suicidal ideation.

F. There is no evidence-based alternative to standard treatments for gender dysphoria. Furthermore, no research demonstrates psychotherapy alone is an effective treatment for gender dysphoria in adolescents.

I understand the Defendants' position to be that transgender youth with gender dysphoria should not be offered medical treatment but instead should only receive psychotherapy. Yet, abundant evidence establishes a clear *causal link* between transitioning medications and well-being *independent* of psychotherapy and other measures of support. Costa et al. in 2015 found that puberty blockers improve psychosocial functioning in teens with gender dysphoria, compared to teens who receive psychotherapy but not blockers.[48] Costa's study was designed to include a control group of transgender teens with gender dysphoria who did not receive puberty blockers.

---

[44] Sorbara JC, Chiniara LN, Thompson S, Palmert MR. Mental health and timing of gender-affirming care. Pediatrics 2020 Oct 1;146(4):e20193600.

[45] Herman JL, Brown TNT, Haas AP. Suicide Thoughts and Attempts Among Transgender Adults [Internet]. Los Angeles (CA): The Williams Institute, UCLA School of Law; 2019 Sept [cited 2022 Apr 1]. Available from: https://williamsinstitute.law.ucla.edu/publications/suicidality-transgender-adults/; Turban JL, Beckwith N, Reisner SL, Keuroghlian AS. Association Between Recalled Exposure to Gender Identity Conversion Efforts and Psychological Distress and Suicide Attempts Among Transgender Adults. JAMA Psychiatry 2019 Sept 11;77(1):68-76.

[46] Coelho JS, Suen J, Clark BA, Marshall SK, Geller J, Lam PY. Eating Disorder Diagnoses and Symptom Presentation in Transgender Youth: a Scoping Review. Curr Psychiatry Rep. 2019 Oct 15;21(11):107; Kamody RC, Yonkers K, Pluhar EI, Olezeski CL. Disordered Eating Among Trans-Masculine Youth: Considerations Through a Developmental Lens. LGBT Health. 2020 May/Jun;7(4):170-73; Legroux I, Cortet B. Factors influencing bone loss in anorexia nervosa: assessment and therapeutic options. RMD Open. 2019 Nov 13;5(2):e001009.

[47] Turban, J. L., King, D., Kobe, J., *et al.* (2022). Access to gender-affirming hormones during adolescence and mental health outcomes among transgender adults. *PLoS One*, 17(1), e0261039.

[48] Costa et al.

In a 2022 study, Tordoff et al found that transitioning medications are associated with improvements in depression and suicidality in a population of transgender and nonbinary youths aged 13 to 20.[49] The authors showed the independent effects of transitioning medications on depression, anxiety, and gender dysphoria. They controlled for temporal trends and other confounding factors, expressly including whether the teen received "ongoing mental health therapy other than for the purpose of a mental health assessment to receive a gender dysphoria diagnosis."[50] Put simply, Tordoff et al. clearly found that youth with gender dysphoria reported better outcomes if they received transitioning medications, even after controlling for the effects of psychotherapy. Similarly, in a 2020 study, Kuper et al. found that hormone therapy made improvements in adolescents' body-related distress and led to improvement in symptoms of depression and anxiety.[51] Kuper et al. specifically collected data on psychotherapy and the use of psychiatric medications and expressly controlled for both. Thus, Kuper et al.'s study shows that hormone treatment for gender dysphoria is effective above and beyond the benefits of psychotherapy and psychiatric medications. In a 2023 study by Chen et al, the investigators found that appearance congruence achieved by transitioning medications was strongly associated with improvements in various measures of mental health and psychosocial functioning.

While Defendants' experts have previously testified that youth with gender dysphoria should be given only psychotherapy and no medical treatment, Defendants' experts base this contention not on any studies demonstrating the efficacy of the Defendants' preferred approach, but instead claiming a purported lack of evidence on the benefits of transitioning medications in the treatment of gender dysphoria. In their PI Declarations, Defendants' experts cited several studies and leveled baseless criticisms that are ignorant to harms of clinical research. I have compiled some of these claims in a table below:

Table: Defendants' experts claims regarding the mental health evidence

Study	Defendants' Expert's Claim	Facts
Kuper 2020	Cantor states that there were no statistically significant differences in the nine psychosocial/mental health outcomes studied, specifically regarding youth on puberty blockers.	The investigators did not conduct a sub-analysis specifically among those on puberty blockers. Rather, they conducted their analysis among youth who used any type of transitioning medications. Many participants were at an advanced stage of puberty during the study and may have been ineligible for blockers.

[49] Diana M. Tordoff et al., Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Gender-Affirming Care, 5(2) JAMA Network Open e220978 (2022).

[50] Id.

[51] Laura E. Kuper, et al., Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy, 145(4) Pediatrics e20193006 (2020).

	Cantor comments that the minimum age for puberty blockers is 12 per the Dutch protocol, and implies this study is flawed or unethical because the earliest age they were started in Kuper et al's cohort was 9.8 years.	Puberty blockers are started based on pubertal stage, which cannot be described by a single chronological age. Puberty can begin at ages earlier than 12.
Achille 2020	Cantor concludes that puberty blockers did not improve mental health over psychotherapy alone in this study.	This study was not capable of establishing a causal relationship between puberty blockers and mental health. Investigators in this study did not have enough participants to run an analysis to establish causation, so they pivoted to a correlation analysis. There is no direct causation inferred from this, and furthermore, this is a preliminary study with further results pending.
Costa 2015	Cantor claims that there were no statistically significant differences between the mental health outcomes in the three study groups.	Individuals who received psychotherapy and puberty blockers had improved psychological functioning compared to those who only received supportive psychotherapy. While the investigators had a small sample size and were unable to achieve statistical significance, the difference in psychological functioning was clinically meaningful.
	Cantor also claims that this study included a cherry-picked control group.	This is a real-world population of transgender youth. They followed clinical practice guidelines to decide who was and was not eligible for puberty blockers. This is the opposite of a cherry-picked control group. It is a real-world control group which is a strength of this study, because its results are generalizable to other populations.
Olson 2016	Dr. Cantor states the statistical analysis of this study was subject to error and actually demonstrated worse mental health outcomes of transgender youth.	The Olson study shows that socially transitioned transgender children have "remarkably good mental health outcomes." Investigators assessed mental health of socially transitioned children in both parents and children themselves, which expands upon previous data that only utilized parental reporting. They did not compare their study subjects to those who had not socially transitioned. This study can only speak to whether socially transitioned children have similar outcomes to nontransgender peers. This

		study's primary research question pertains to the mental health experiences of socially transitioned children compared to a diverse population of children of similar ages. The findings of this study demonstrate that these transgender children have similar mental health outcomes to nontransgender children. Further, the Olson study was not subject to any expert re-analysis
Van der Miesen	Dr. Cantor criticizes this study because he claims it cannot establish the long-term benefits of puberty blockers on mental health.	This is a cross sectional study. By definition, it cannot assess the long-term impact on an intervention because it assesses data at a single point in time. This critique is unscientific because it attacks a study for not answering a research question it was never designed to answer.
de Vries 2011, 2014	Dr. Cantor claims that because these studies did not include a control group, it cannot establish the independent effects of puberty blockers on mental health. He calls this a "confound".	These were the first studies evaluating the impact of puberty blockers on mental health outcomes and psychological functioning. A unilateral quarrel with these studies' methodology is flawed because there are other studies that either had a control group (Costa 2015, Turban 2020, van der Misen et al. 2020) or gathered data on mental health and controlled for it in the analysis (Kuper 2020, Tordoff 2022) or established independent associations between appearance congruence and mental health (Chen 2023). In clinical research, it is methodologically sound to either control for a potential confounder by gathering data on it and including that data in the statistical analysis or using a control group. In other cases, it may not be feasible to control for a confounder because that confounder isn't measurable. In either case, this critique does not engage with the findings of the studies or the research questions they were designed to answer.
Carmichael	Cantor states that this study shows "deteriorating or lack of improvement in mental health"	This is a study on the mental health impacts of puberty blockers. No deterioration in any mental health outcome was observed in this study. As discussed previously, stability in mental health does not denote a "lack of

		improvement" when considered from the patient's perspective. Stability is a clinically meaningful and positive outcome.
	Cantor cites a re-analyzed dataset by Dr. Biggs.	Dr. Biggs is not a medical or mental health expert. He offered his own interpretation of partial, uncleaned data from the Carmichael study to conclude participants reported greater self-harm, without disclosing statistical methodology used. The actual Carmichael study made no such finding. The study itself notes, "These data correct reports from a recent letter by Biggs, which used preliminary data from our study, which were uncleaned and incomplete data used for internal reporting."

There are additional, more systematic issues with the Defendants' experts claims about supposed confounding in studies of the mental health benefits of essential medical treatment for gender dysphoria and psychotherapy. Psychotherapy is a highly general term to describe a wide variety of therapeutic interventions. To date, Defendants' experts have offered no definition of what they consider psychotherapy to be. WPATH and the American Psychiatric Association are quite clear that mental health supports are in place to allow youth to talk about their experiences, screen for safety issues such as suicide, non-suicide self-injury and eating disorders, assess for trauma, understand one's home life and identify, then treat additional mental health issues. Studies of so-called "conversion" or "reparative" therapy finds that transgender identity is highly resistant to change even in the face of concerted efforts by medical authorities versed in psychological methods, and is psychologically damaging.[52]

A. Randomized-controlled trials in standard treatment of gender dysphoria are not feasible, ethical, or necessary

Based upon their PI Declarations, I anticipate that Defendants' experts may claim that the benefits of essential medical treatment for gender dysphoria cannot be known without randomized control trials comparing outcomes of youth with gender dysphoria who receive transitioning medications versus those who do not. Randomized control trials in standard treatments of gender dysphoria, however, are not feasible, ethical, or necessary. Institutional

[52] A survey of the scientific literature by the U.S. Department of Health and Human Services finds that "none of the existing research supports the premise that mental or behavioral health interventions can alter gender identity or sexual orientation." Substance Abuse and Mental Health Services Administration, Ending Conversion Therapy: Supporting and Affirming LGBTQ Youth, U.S. Department of Health and Human Services, HHS Publication No. (SMA) 15-4928 (2015), p. 1.

review boards appraise and approve all research protocol before they can proceed, whether these trials emerge from industry, academia, or government. These groups have stringent criteria for assessing the safety, ethical strength, feasibility, and necessity of a proposed study. Such criteria are exceptionally stringent in pediatrics. As I outline below, no institutional review board would approve a research protocol on a randomized control trial in essential medical treatment for gender dysphoria because of the established science which demonstrates the efficacy of treatment with transitioning medications.

Each study design has strengths and weaknesses and selecting among them depends on a variety of factors including the study question, ethical considerations, feasibility, and cost. The major benefit of a randomized trial is that it decreases the likelihood that any differences in the outcomes between the groups is the result of baseline differences between the groups rather than the result of the intervention. Observational studies offer a widely accepted way to inform strong clinical practice guidelines and, in many cases, are superior to randomized controlled trials. Notable examples of standard clinical care that derives its evidence-base from observational data includes penicillin for many types of infections (including streptococcal infections and syphilis), insulin for diabetes, mammography for breast cancer screening, certain types of minimally invasive surgery (such as laparoscopic gallbladder surgery), and statin drugs for lowering cholesterol. Observational studies offer the additional benefit of recording evidence about patients in a real-world setting. The results of observational studies are, thus, reliably generalizable. Any claim that randomized controlled trials are both necessary and superior reflects a lack of knowledge of the norms of clinical research.

Randomized control trials rely on a key feature known as "blinding" to minimize confounding from the placebo effect. That is, study participants in the control group, may experience different outcomes due to unmeasured factors associated with knowing they are not receiving the intervention. In the case of medical treatment for gender dysphoria, it would be impossible to blind participants to receipt of the intervention, because physical changes either would or would not occur during the study period. That is, youth and their parents would know whether puberty was paused (in the case of blockers) or whether secondary sex characteristics began to develop (in the case of cross-sex hormones).

In many cases, it can be unethical to conduct randomized controlled trials. For a randomized trials to be ethical, clinical equipoise must exist. This means that there must be more uncertainty that the intervention is beneficial than no treatment. In the case of medical treatments for gender dysphoria, as we have shown, the benefits of transitioning medications are well understood and thus it would be unethical to expose participants to an intervention that is known to be harmful. Furthermore, such calls for randomized controlled trials in pediatrics are particularly flawed because they ignore the fact that recommendations for pediatric care made by professional associations in guidelines are seldom based on randomized controlled trials due to their rarity and are, instead, frequently based on observational studies.

II. Adolescents with gender dysphoria persist in their cross-gender identification.

The scientific evidence on the course of gender dysphoria emphasizes the importance of distinguishing between prepubertal children and adolescents. The evidence suggests that the

course of dysphoria is more diverse for prepubertal children, and so it is critical to recognize them as a distinct population from adolescents. The evidence shows that the vast majority of adolescents who are diagnosed with gender dysphoria will persist in their gender identity and will benefit from gender transition.[53] In a Dutch study, among 70 adolescents diagnosed with gender dysphoria and treated with puberty blockers, 100% opted to continue with transitioning medications.[54] A recent U.S. study found a consistent pattern. Following a large cohort of U.S. young people who reported some evidence of gender dysphoria but had not yet been formally diagnosed, the study found that adolescents were far more likely than prepubertal children to go on to a formal diagnosis of gender dysphoria and to receive medical treatment.[55]

Even with respect to prepubertal children, the studies relied on by Defendants' experts overstate the percentage of children who cease to have gender dysphoria because their data was based on overly broad diagnostic criteria.[56] That is, the studies likely included prepubertal children with gender variant behavior (e.g., boys with feminine interests or "tomboy" girls) alongside children who would meet today's diagnostic criteria for gender dysphoria – a deeply felt and lasting transgender identity with clinically significant distress and impaired functioning.[57] This is further borne out by the recent finding that "the intensity of early dysphoria appears to be an important predictor" of the persistence of dysphoria into adolescence.[58]

In addition, in contrast to prepubertal children, adolescents with gender dysphoria rarely find that their dysphoria resolves without treatment. As a result, because medical treatment for gender dysphoria begins only in adolescence, and only if medically necessary for gender dysphoria, medical treatment is thus provided only to a group known to be quite stable in their gender identity. For example, a recent study, Olson et al. (2022), found that after an average of 5

---

[53] American Psychological Association (2015), p. 843; WPATH (2012), p. 11; Endocrine Society (2017). See also Turban JL, DeVries ALC, Zucker K. Gender Incongruence & Gender Dysphoria. In Martin A, Bloch MH, Volkmar FR (editors): Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook, Fifth Edition. Philadelphia: Wolters Kluwer 2018, pp. 20-21 ("we must recognize that [the existing studies of persistence] have been quite limited in power and generalizability and should not be misused to create barriers for TGD youth seeking gender-affirming care. The most relevant conclusions from these studies are that insistent cross-gender identification in adolescence most often correlates with persistent TGD identities in adulthood").

[54] de Vries et al. 2011, cited in note 43 ("None of the gender dysphoric adolescents in this study renounced their wish for [gender reassignment] during puberty suppression. This finding supports earlier studies showing that young adolescents who had been carefully diagnosed show persisting gender dysphoria into late adolescence or young adulthood").

[55] Wagner S, Panagiotakopoulos L, Nash R, Bradlyn A, Getahun D, Lash TL, Roblin D, Silverberg MJ, Tangpricha V, Vupputuri S, Goodman M. Progression of Gender Dysphoria in Children and Adolescents: A Longitudinal Study. Pediatrics. 2021 Jul;148(1):e2020027722. doi: 10.1542/peds.2020-027722. Epub 2021 Jun 7. PMID: 34099504; PMCID: PMC8276590..

[56] See Temple Newhook J, Pyne J, Winters K, Feder S, Holmes C, Tosh J, Sinnott ML, Jamieson A, and Pickett S, A critical commentary on follow-up studies and "desistance" theories about transgender and gender-nonconforming children, International Journal of Transgenderism, vol. 19(2), pp. 212-224 (2018) doi: 10.1080/15532739.2018.1456390.

[57] Endocrine Society (2017).

[58] Steensma TD, McGuire JK, Kreukels BP, Beekman AJ, Cohen-Kettenis PT. Factors associated with desistence and persistence of childhood gender dysphoria: a quantitative follow-up study. J Am Acad Child Adolesc Psychiatry. 2013 Jun;52(6):582-90 (finding that "children with persistent GID are characterized by more extreme gender dysphoria in childhood than children with desisting gender dysphoria").

years of social transition, only 2.5% of youth identified as nontransgender.[59] Another recent study of 720 individuals demonstrated that the vast majority of transgender adolescents go on to continue receiving transition care as adults.[60]

III. So-called "watchful waiting" is not a recognized protocol for youth once they have reached puberty.

In their PI Declarations, Defendants' experts argued, without scientific evidence or without proposing an evidence-based alternative, that youth with gender dysphoria should not be offered medical treatment but instead should only receive psychotherapy, an approach that they mistakenly term "watchful waiting."

"Watchful waiting" is a concept invoked in deciding whether or not a *pre-pubertal* child should engage in a social transition (e.g., adopting a name, pronouns, and gender expression, such as clothing and haircuts, that match their gender identity). Watchful waiting is thus irrelevant to the use of transitioning medications, which are offered only after puberty has begun. Moreover, social transition is irrelevant to the Vulnerable Child Compassion Act, which prohibits the use of medications used after puberty has started and is thus, not discussed further in this report.

IV. The overwhelming majority of adolescents who receive transitioning medications continue to do so as adults

Evidence shows that young people who receive essential treatments for gender dysphoria during adolescence overwhelmingly continue them into early adulthood. Indeed, recent studies demonstrate that the vast majority of youth who start medical treatments in adolescence continue these treatments in early adulthood. One study examined 720 people who had started GnRHa (median ages 14-16) and found that 98% continued use of these medications at follow up.[61]

The supposed concept of a wave of transgender individuals who initially received and consented to essential medical treatment for gender dysphoria and then regretted it is unfounded.

V. No valid research supports any evidence that peer influence increases rates of gender dysphoria or even have any effect on it. Research shows gender identity has a strong, innate biological basis.

---

[59] Olson KR, Durwood L, Horton R, Gallagher NM, Devor A. Gender Identity 5 Years After Social Transition. Pediatrics. 2022 Aug 1;150(2):e2021056082. doi: 10.1542/peds.2021-056082. PMID: 35505568.

[60] Van der Loos MATC, Hannema SE, Klink DT, den Heijer M, Wiepjes CM. Continuation of gender-affirming hormones in transgender people starting puberty suppression in adolescence: a cohort study in the Netherlands. Lancet Child Adolesc Health. 2022 Dec;6(12):869-875. doi: 10.1016/S2352-4642(22)00254-1. Epub 2022 Oct 21. PMID: 36273487.

[61] Maria A.T.C. van der Loos, et al., Continuation of Gender-Affirming Hormones in Transgender People Starting Puberty Suppression in Adolescence: A Cohort Study in the Netherlands, The Lancet Child and Adolescent Health, Oct. 21, 2022, at https://www.sciencedirect.com/science/article/abs/pii/S2352464222002541.

Defendants' experts may claim that social contagion is the cause of gender dysphoria, citing as evidence a discredited study by Lisa Littman.[62] Littman's 2018 article contended that a novel pathology, "rapid-onset gender dysphoria" was leading teenagers to claim a transgender identity because of peer influence. As a number of experts and researchers have noted, however, Littman's study suffers from serious methodological errors, including the use of parent reports instead of clinical data and the recruitment of its sample of parents from anti-transgender websites.[63] The journal of publication required an extensive correction of the original Littman article because of its misstatements.[64]

Littman's hypothesis that rapid-onset gender dysphoria exists as a distinct condition has not been supported by studies of clinical data.[65] Neither the American Psychiatric Association nor any other reputable professional organization has recognized rapid-onset gender dysphoria as a distinct clinical condition or diagnosis.[66] Although Littman's hypothesis has been widely covered in the press, no clinical studies have found that rapid-onset gender dysphoria exists. For example, an April 2022 study of 173 youth presenting at Canadian gender clinics found no evidence of rapid-onset dysphoria or social contagion.[67] Further, no professional organization has recognized "rapid-onset gender dysphoria" as a distinct clinical condition or diagnosis

VI. Conclusion

In conclusion, my expert opinion is that the Alabama ban on transitioning medications for transgender minors is harmful. If allowed to go into effect, it will cause serious injury to transgender adolescents. Gender dysphoria is a serious but highly treatable medical condition.

---

[62] Littman L. Parent reports of adolescents and young adults perceived to show signs of a rapid onset of gender dysphoria. PLoS One. 2018 Aug 16;13(8):1-44; Littman L. Correction: Parent reports of adolescents and young adults perceived to show signs of a rapid onset of gender dysphoria. PLoS One. 2019 Mar 19;14(3):1-7.

[63] Restar AJ. Methodological Critique of Littman's (2018) Parental-Respondents Accounts of "Rapid-Onset Gender Dysphoria". Arch Sex Behav. 2020 Jan;49(1):61-66. doi: 10.1007/s10508-019-1453-2; Temple Newhook, J, Pyne, J, Winters, K, Feder, S, Holmes, C, Tosh, J, and Pickett, S. A critical commentary on follow-up studies and "desistance" theories about transgender and gender-nonconforming children. *International Journal of Transgenderism*, *19*(2), 212-224. (2018); see also WPATH Global Board of Directors. WPATH Position on "Rapid-Onset Gender Dysphoria" [Internet]. 2018 Sep 4 [cited 2022 Apr 1]. Available from: https://www.wpath.org/media/cms/Documents/Public%20Policies/2018/9_Sept/WPATH%20Position%20on%20Rapid-Onset%20Gender%20Dysphoria_9-4-2018.pdf.

[64] Littman L. Correction: Parent reports of adolescents and young adults perceived to show signs of a rapid onset of gender dysphoria. PLoS One. 2019 Mar 19;14(3):1-7 (altering the original article to clarify that the article collected no data from adolescents or clinicians and generates only a hypothesis for further exploration).

[65] Bauer GR, Lawson ML, Metzger DL; Trans Youth CAN! Research Team. Do Clinical Data from Transgender Adolescents Support the Phenomenon of "Rapid Onset Gender Dysphoria"? J Pediatr. 2022 Apr; 243:224-227. See also Arnoldussen M, Steensma TD, Popma A, van der Miesen AIR, Twisk JWR, de Vries ALC. Re-evaluation of the Dutch approach: are recently referred transgender youth different compared to earlier referrals? Eur Child Adolesc Psychiatry. 2020 Jun;29(6):803-811. Erratum in: Eur Child Adolesc Psychiatry. 2020 Dec 16 (concluding that there has been no marked change in the characteristics of the population of adolescents referred for gender dysphoria from 2000 to 2016; the authors hypothesize that the increase in number of referrals reflects the increasing social acceptability of seeking treatment).

[66] Restar (2018), cited in note 70.

[67] Bauer, Greta R. et al., Do Clinical Data from Transgender Adolescents Support the Phenomenon of "Rapid Onset Gender Dysphoria"? The Journal of Pediatrics, Volume 243, 224 - 227.e2.

The standard of care for treatment of transgender adolescents who have begun puberty includes, as determined by individual need, the prescription of transitioning medications, including puberty blockers and hormone therapy, after rigorous medical assessment and evaluation followed by parental consent and patient assent. The medications used for treatment of transgender adolescents are safe and effective. Adolescent patients with gender dysphoria who are treated consistent with the standard of care can thrive. My experience treating patients demonstrates that, as does a solid body of scientific evidence.

I hold each of the opinions expressed in this report with a reasonable degree of scientific certainty based on the materials I have reviewed and based on my education, experience, and knowledge. I reserve the right to supplement, amend, or modify my opinions upon review of further information, including, but not limited to, testimony, documents, and reports I receive after the date of this report.

Executed this 8 th day of February, 2023.

Meredithe McNamara, MD, MS, FAAP

OPEN ACCESS Freely available online

PLoS one

Long-Term Follow-Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden

Cecilia Dhejne[1], Paul Lichtenstein[2], Marcus Boman[2], Anna L. V. Johansson[2], Niklas Långström[2,3], Mikael Landén[1,2,4]*

1 Department of Clinical Neuroscience, Division of Psychiatry, Karolinska Institutet, Stockholm, Sweden, **2** Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden, **3** Centre for Violence Prevention, Karolinska Institutet, Stockholm, Sweden, **4** Institute of Neuroscience and Physiology, The Sahlgrenska Academy at Gothenburg University, Gothenburg, Sweden

Abstract

Context: The treatment for transsexualism is sex reassignment, including hormonal treatment and surgery aimed at making the person's body as congruent with the opposite sex as possible. There is a dearth of long term, follow-up studies after sex reassignment.

Objective: To estimate mortality, morbidity, and criminal rate after surgical sex reassignment of transsexual persons.

Design: A population-based matched cohort study.

Setting: Sweden, 1973-2003.

Participants: All 324 sex-reassigned persons (191 male-to-females, 133 female-to-males) in Sweden, 1973–2003. Random population controls (10:1) were matched by birth year and birth sex or reassigned (final) sex, respectively.

Main Outcome Measures: Hazard ratios (HR) with 95% confidence intervals (CI) for mortality and psychiatric morbidity were obtained with Cox regression models, which were adjusted for immigrant status and psychiatric morbidity prior to sex reassignment (adjusted HR [aHR]).

Results: The overall mortality for sex-reassigned persons was higher during follow-up (aHR 2.8; 95% CI 1.8–4.3) than for controls of the same birth sex, particularly death from suicide (aHR 19.1; 95% CI 5.8–62.9). Sex-reassigned persons also had an increased risk for suicide attempts (aHR 4.9; 95% CI 2.9–8.5) and psychiatric inpatient care (aHR 2.8; 95% CI 2.0–3.9). Comparisons with controls matched on reassigned sex yielded similar results. Female-to-males, but not male-to-females, had a higher risk for criminal convictions than their respective birth sex controls.

Conclusions: Persons with transsexualism, after sex reassignment, have considerably higher risks for mortality, suicidal behaviour, and psychiatric morbidity than the general population. Our findings suggest that sex reassignment, although alleviating gender dysphoria, may not suffice as treatment for transsexualism, and should inspire improved psychiatric and somatic care after sex reassignment for this patient group.

Citation: Dhejne C, Lichtenstein P, Boman M, Johansson ALV, Långström N, et al. (2011) Long-Term Follow-Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden. PLoS ONE 6(2): e16885. doi:10.1371/journal.pone.0016885

Editor: James Scott, The University of Queensland, Australia

Received September 30, 2010; **Accepted** January 9, 2011; **Published** February 22, 2011

Funding: Financial support was provided through the regional agreement on medical training and clinical research (ALF) between Stockholm County Council and the Karolinska Institutet, and through grants from the Swedish Medical Research Council (K2008-62x-14647-06-3) and the Royal Swedish Academy of Sciences (Torsten Amundson's Foundation). The sponsors of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. All authors had full access to the data in the study and the final responsibility for the decision to submit for publication was made by the corresponding author.

Competing Interests: The authors have declared that no competing interests exist.

* E-mail: mikael.landen@neuro.gu.se

Introduction

Transsexualism (ICD-10),[1] or gender identity disorder (DSM-IV),[2] is a condition in which a person's gender identity - the sense of being a man or a woman - contradicts his or her bodily sex characteristics. The individual experiences gender dysphoria and desires to live and be accepted as a member of the opposite sex.

The treatment for transsexualism includes removal of body hair, vocal training, and cross-sex hormonal treatment aimed at making the person's body as congruent with the opposite sex as possible to alleviate the gender dysphoria. Sex reassignment also involves the surgical removal of body parts to make external sexual characteristics resemble those of the opposite sex, so called sex reassignment/confirmation surgery (SRS). This is a unique

intervention not only in psychiatry but in all of medicine. The present form of sex reassignment has been practised for more than half a century and is the internationally recognized treatment to ease gender dysphoria in transsexual persons.[3,4]

Despite the long history of this treatment, however, outcome data regarding mortality and psychiatric morbidity are scant. With respect to suicide and deaths from other causes after sex reassignment, an early Swedish study followed 24 transsexual persons for an average of six years and reported one suicide.[5] A subsequent Swedish study recorded three suicides after sex reassignment surgery of 175 patients.[6] A recent Swedish follow-up study reported no suicides in 60 transsexual patients, but one death due to complications after the sex reassignment surgery.[7] A Danish study reported death by suicide in 3 out of 29 operated male-to-female transsexual persons followed for an average of six years.[8] By contrast, a Belgian study of 107 transsexual persons followed for 4–6 years found no suicides or deaths from other causes.[9] A large Dutch single-centre study (N = 1,109), focusing on adverse events following hormonal treatment, compared the outcome after cross-sex hormone treatment with national Dutch standardized mortality and morbidity rates and found no increased mortality, with the exception of death from suicide and AIDS in male-to-females 25–39 years of age.[10] The same research group concluded in a recent report that treatment with cross-sex hormones seems acceptably safe, but with the reservation that solid clinical data are missing.[11] A limitation with respect to the Dutch cohort is that the proportion of patients treated with cross-sex hormones who also had surgical sex-reassignment is not accounted for.[10]

Data is inconsistent with respect to psychiatric morbidity post sex reassignment. Although many studies have reported psychiatric and psychological improvement after hormonal and/or surgical treatment,[7,12,13,14,15,16] other have reported on regrets,[17] psychiatric morbidity, and suicide attempts after SRS.[9,18] A recent systematic review and meta-analysis concluded that approximately 80% reported subjective improvement in terms of gender dysphoria, quality of life, and psychological symptoms, but also that there are studies reporting high psychiatric morbidity and suicide rates after sex reassignment.[19] The authors concluded though that the evidence base for sex reassignment "is of very low quality due to the serious methodological limitations of included studies."

The methodological shortcomings have many reasons. First, the nature of sex reassignment precludes double blind randomized controlled studies of the result. Second, transsexualism is rare [20] and many follow-ups are hampered by small numbers of subjects.[5,8,21,22,23,24,25,26,27,28] Third, many sex reassigned persons decline to participate in follow-up studies, or relocate after surgery, resulting in high drop-out rates and consequent selection bias.[6,9,12,21,24,28,29,30] Forth, several follow-up studies are hampered by limited follow-up periods.[7,9,21,22,26,30] Taken together, these limitations preclude solid and generalisable conclusions. A long-term population-based controlled study is one way to address these methodological shortcomings.

Here, we assessed mortality, psychiatric morbidity, and psychosocial integration expressed in criminal behaviour after sex reassignment in transsexual persons, in a total population cohort study with long-term follow-up information obtained from Swedish registers. The cohort was compared with randomly selected population controls matched for age and gender. We adjusted for premorbid differences regarding psychiatric morbidity and immigrant status. This study design sheds new light on transsexual persons' health after sex reassignment. It does not, however, address whether sex reassignment is an effective treatment or not.

Methods

National registers

The study population was identified by the linkage of several Swedish national registers, which contained a total of 13.8 million unique individuals. The Hospital Discharge Register (HDR, held by the National Board of Health and Welfare) contains discharge diagnoses, up to seven contributory diagnoses, external causes of morbidity or mortality, surgical procedure codes, and discharge date. Discharge diagnoses are coded according to the 8th (1969-1986), 9th (1987–1996), and 10th editions (1997-) of the International Classification of Diseases (ICD). The register covers virtually all psychiatric inpatient episodes in Sweden since 1973. Discharges that occurred up to 31 December 2003 were included. Surgical procedure codes could not be used for this study due to the lack of a specific code for sex reassignment surgery. The Total Population Register (TPR, held by Statistics Sweden) is comprised of data about the entire Swedish population. Through linkage with the Total Population Register it was possible to identify birth date and birth gender for all study subjects. The register is updated every year and gender information was available up to 2004/2005. The Medical Birth Register (MBR) was established in 1973 and contains birth data, including gender of the child at birth. National censuses based on mandatory self-report questionnaires completed by all adult citizens in 1960, 1970, 1980, and 1990 provided information on individuals, households, and dwellings, including gender, living area, and highest educational level. Complete migration data, including country of birth for immigrants for 1969–2003, were obtained from the TPR. In addition to educational information from the censuses, we also obtained highest educational level data for 1990 and 2000 from the Register of Education. The Cause of Death Register (CDR, Statistics Sweden) records all deaths in Sweden since 1952 and provided information on date of death and causes of death. Death events occurring up to 31 December 2003 are included in the study. The Crime Register (held by the National Council of Crime Prevention) provided information regarding crime type and date on all criminal convictions in Sweden during the period 1973–2004. Attempted and aggravated forms of all offences were also included. All crimes in Sweden are registered regardless of insanity at the time of perpetration; for example, for individuals who suffered from psychosis at the time of the offence. Moreover, conviction data include individuals who received custodial or non-custodial sentences and cases where the prosecutor decided to caution or fine without court proceedings. Finally, Sweden does not differ considerably from other members of the European Union regarding rates of violent crime and their resolution.[31]

Study population, identification of sex-reassigned persons (exposure assessment)

The study was designed as a population-based matched cohort study. We used the individual national registration number, assigned to all Swedish residents, including immigrants on arrival, as the primary key through all linkages. The registration number consists of 10 digits; the first six provide information of the birth date, whereas the ninth digit indicates the gender. In Sweden, a person presenting with gender dysphoria is referred to one of six specialised gender teams that evaluate and treat patients principally according to international consensus guidelines: Standards of Care.[3] With a medical certificate, the person applies to the National Board of Health and Welfare to receive permission for sex reassignment surgery and a change of legal sex status. A new national registration number signifying the new gender is assigned after sex reassignment surgery. The National

Board of Health and Welfare maintains a link between old and new national registration numbers, making it possible to follow individuals undergoing sex reassignment across registers and over time. Hence, sex reassignment surgery in Sweden requires (i) a transsexualism diagnosis and (ii) permission from the National Board of Health and Welfare.

A person was defined as exposed to sex reassignment surgery if two criteria were met: (i) at least one inpatient diagnosis of gender identity disorder diagnosis without concomitant psychiatric diagnoses in the Hospital Discharge Register, and (ii) at least one discrepancy between gender variables in the Medical Birth Register (from 1973 and onwards) or the National Censuses from 1960, 1970, 1980, or 1990 and the latest gender designation in the Total Population Register. The first criterion was employed to capture the hospitalization for sex reassignment surgery that serves to secure the diagnosis and provide a time point for sex reassignment surgery; the plastic surgeons namely record the reason for sex reassignment surgery, i.e., transsexualism, but not any co-occurring psychiatric morbidity. The second criterion was used to ensure that the person went through all steps in sex-reassignment and also changed sex legally.

The date of sex reassignment (start of follow-up) was defined as the first occurrence of a gender identity disorder diagnosis, without any other concomitant psychiatric disorder, in the Hospital Discharge Register after the patient changed sex status (any discordance in sex designation across the Censuses, Medical Birth, and Total Population registers). If this information was missing, we used instead the closest date in the Hospital Discharge Register on which the patient was diagnosed with gender identity disorder without concomitant psychiatric disorder prior to change in sex status. The reason for prioritizing the use of a gender identity disorder diagnosis *after* changed sex status over *before* was to avoid overestimating person-years at risk of sex-reassigned person.

Using these criteria, a total of 804 patients with gender identity disorder were identified, whereof 324 displayed a shift in the gender variable during the period 1973–2003. The 480 persons that did not shift gender variable comprise persons who either did not apply, or were not approved, for sex reassignment surgery. Moreover, the ICD 9 code 302 is a non specific code for sexual disorders. Hence, this group might also comprise persons that were hospitalized for sexual disorders other than transsexualism. Therefore, they were omitted from further analyses. Of the remaining 324 persons, 288 were identified with the gender identity diagnosis *after* and 36 *before* change of sex status. Out of the 288 persons identified *after* changed sex status, 185 could also be identified *before* change in sex status. The median time lag between the hospitalization *before* and *after* sex change for these 185 persons was 0.96 years (mean 2.2 years, SD 3.3).

Gender identity disorder was coded according to ICD-8: 302.3 (transsexualism) and 302.9 (sexual deviation NOS); ICD-9: 302 (overall code for sexual deviations and disorders, more specific codes were not available in ICD-9); and ICD-10: F64.0 (transsexualism), F64.1 (dual-role transvestism), F64.8 (other gender identity disorder), and F64.9 (gender identity disorder NOS). Other psychiatric disorders were coded as ICD-8: 290-301 and 303-315; ICD-9: 290-301 and 303-319; and ICD-10: F00-F63 as well as F65-F99.

Identification of population-based controls (unexposed group)

For each exposed person (N = 324), we randomly selected 10 unexposed controls. A person was defined as unexposed if there were no discrepancies in sex designation across the Censuses, Medical Birth, and Total Population registers *and* no gender identity disorder diagnosis according to the Hospital Discharge Register. Control persons were matched by sex and birth year and had to be alive and residing in Sweden at the estimated sex reassignment date of the case person. To study possible gender-specific effects on outcomes of interest, we used two different control groups: one with the same sex as the case individual at birth (birth sex matching) and the other with the sex that the case individual had been reassigned to (final sex matching).

Outcome measures

We studied mortality, psychiatric morbidity, accidents, and crime following sex reassignment. More specifically, we investigated: (1) all-cause mortality, (2) death by definite/uncertain suicide, (3) death by cardiovascular disease, and (4) death by tumour. Morbidity included (5) any psychiatric disorder (gender identity disorders excluded), (6) alcohol/drug misuse and dependence, (7) definite/uncertain suicide attempt, and (8) accidents. Finally, we addressed court convictions for (9) any criminal offence and (10) any violent offence. Each individual could contribute with several outcomes, but only one event per outcome. Causes of death (Cause of Death Registry from 1952 and onwards) were defined according to ICD as suicide (ICD-8 and ICD-9 codes E950-E959 and E980-E989, ICD-10 codes X60-X84 and Y10-Y34); cardiovascular disease (ICD-8 codes 390-458, ICD-9 codes 390-459, ICD-10 codes I00-I99); neoplasms (ICD-8 and ICD-9 codes 140-239, ICD-10 codes C00-D48), any psychiatric disorder (gender identity disorders excluded); (ICD-8 codes 290-301 and 303-315, ICD-9 codes 290-301 and 303-319, ICD-10 codes F00-F63 and F65-F99); alcohol/drug abuse and dependence (ICD-8 codes 303-304, ICD-9 codes 303-305 (tobacco use disorder excluded), ICD-10 codes F10-F16 and F18-F19 (x5 excluded); and accidents (ICD-8 and ICD-9 codes E800-E929, ICD-10 codes V01-X59).

Any criminal conviction during follow-up was counted; specifically, violent crime was defined as homicide and attempted homicide, aggravated assault and assault, robbery, threatening behaviour, harassment, arson, or any sexual offense.[32]

Covariates

Severe psychiatric morbidity was defined as inpatient care according to ICD-8 codes 291, 295-301, 303-304, and 307; ICD-9 codes 291-292, 295-298, 300-301, 303-305 (tobacco use disorder excluded), 307.1, 307.5, 308-309, and 311; ICD-10 codes F10-F16, F18-F25, F28-F45, F48, F50, and F60-F62. Immigrant status, defined as individuals born abroad, was obtained from the Total Population Register. All outcome/covariate variables were dichotomized (i.e., affected or unaffected) and without missing values.

Statistical analyses

Each individual contributed person-time from study entry (for exposed: date of sex reassignment; for unexposed: date of sex reassignment of matched case) until date of outcome event, death, emigration, or end of study period (31 December 2003), whichever came first. The association between exposure (sex reassignment) and outcome (mortality, morbidity, crime) was measured by hazard ratios (HR) with 95% CIs, taking follow-up time into account. HRs were estimated from Cox proportional hazard regression models, stratified on matched sets (1:10) to account for the matching by sex, age, and calendar time (birth year). We present crude HRs (though adjusted for sex and age through matching) and confounder-adjusted HRs [aHRs] for all outcomes. The two potential confounders, immigrant status (yes/no) and history of severe psychiatric morbidity (yes/no) prior to sex

reassignment, were chosen based on previous research[18,33] and different prevalence across cases and controls (Table 1).

Gender-separated analyses were performed and a Kaplan-Meier survival plot graphically illustrates the survival of the sex reassigned cohort and matched controls (all-cause mortality) over time. The significance level was set at 0.05 (all tests were two-sided). All outcome/covariate variables were without missing values, since they are generated from register data, which are either present (affected) or missing (unaffected). The data were analysed using SAS version 9.1 (SAS Institute Inc., Cary, NC, USA).

Ethics

The data linking of national registers required for this study was approved by the IRB at Karolinska Institutet, Stockholm. All data were analyzed anonymously; therefore, informed consent for each individual was neither necessary nor possible.

Results

We identified 324 transsexual persons (exposed cohort) who underwent sex reassignment surgery and were assigned a new legal sex between 1973 and 2003. These constituted the sex-reassigned (exposed) group. Fifty-nine percent (N = 191) of sex-reassigned persons were male-to-females and 41% (N = 133) female-to-males, yielding a sex ratio of 1.4:1 (Table 1).

The average follow-up time for all-cause mortality was 11.4 (median 9.1) years. The average follow-up time for the risk of being hospitalized for any psychiatric disorder was 10.4 (median 8.1).

Characteristics prior to sex reassignment

Table 1 displays demographic characteristics of sex-reassigned and control persons prior to study entry (sex reassignment). There were no substantial differences between female-to-males and male-to-females regarding measured baseline characteristics. Immigrant status was twice as common among transsexual individuals compared to controls, living in an urban area somewhat more common, and higher education about equally prevalent. Transsexual individuals had been hospitalized for psychiatric morbidity other than gender identity disorder prior to sex reassignment about four times more often than controls. To adjust for these baseline discrepancies, hazard ratios adjusted for immigrant status and psychiatric morbidity prior to baseline are presented for all outcomes [aHRs].

Mortality

Table 2 describes the risks for selected outcomes during follow-up among sex-reassigned persons, compared to same-age controls of the same birth sex. Sex-reassigned transsexual persons of both genders had approximately a three times higher risk of all-cause mortality than controls, also after adjustment for covariates. Table 2

Table 1. Baseline characteristics among sex-reassigned subjects in Sweden (N = 324) and population controls matched for birth year and sex.

Characteristic at baseline	Sex-reassigned subjects (N = 324)	Birth-sex matched controls (N = 3,240)	Final-sex matched controls (N = 3,240)
Gender			
Female at birth, male after sex change	133 (41%)	1,330 (41%)	1,330 (41%)
Male at birth, female after sex change	191 (59%)	1,910 (59%)	1,910 (59%)
Average age at study entry [years] (SD, min-max)			
Female at birth, male after sex change	33.3 (8.7, 20–62)	33.3 (8.7, 20–62)	33.3 (8.7, 20–62)
Male at birth, female after sex change	36.3 (10.1, 21–69)	36.3 (10.1, 21–69)	36.3 (10.1, 21–69)
Both genders	35.1 (9.7, 20–69)	35.1 (9.7, 20–69)	35.1 (9.7, 20–69)
Immigrant status			
Female at birth, male after sex change	28 (21%)	118 (9%)	100 (8%)
Male at birth, female after sex change	42 (22%)	176 (9%)	164 (9%)
Both genders	70 (22%)	294 (9%)	264 (8%)
Less than 10 years of schooling prior to entry vs. 10 years or more			
Females at birth, males after sex change	49 (44%); 62 (56%)	414 (37%); 714 (63%)	407 (36%); 713 (64%)
Males at birth, females after sex change	61 (41%); 89 (59%)	665 (40%); 1,011 (60%)	595 (35%); 1,091 (65%)
All individuals with data	110 (42%); 151 (58%)	1,079 (38%); 1,725 (62%)	1,002 (36%); 1,804 (64%)
Psychiatric morbidity* prior to study entry			
Female at birth, male after sex change	22 (17%)	47 (4%)	42 (3%)
Male at birth, female after sex change	36 (19%)	76 (4%)	72 (4%)
Both genders	58 (18%)	123 (4%)	114 (4%)
Rural [vs. urban] living area prior to entry			
Female at birth, male after sex change	13 (10%)	180 (14%)	195 (15%)
Male at birth, female after sex change	20 (10%)	319 (17%)	272 (14%)
Both genders	33 (10%)	499 (15%)	467 (14%)

Note:
*Hospitalizations for gender identity disorder were not included.
doi:10.1371/journal.pone.0016885.t001

Table 2. Risk of various outcomes among sex-reassigned subjects in Sweden (N = 324) compared to population controls matched for birth year and birth sex.

	Number of events cases/ controls 1973–2003	Outcome incidence rate per 1000 person-years 1973–2003 (95% CI)		Crude hazard ratio (95% CI) 1973–2003	Adjusted* hazard ratio (95% CI) 1973–2003	Adjusted* hazard ratio (95% CI) 1973–1988	Adjusted* hazard ratio (95% CI) 1989–2003
		Cases	Controls				
Any death	27/99	7.3 (5.0–10.6)	2.5 (2.0–3.0)	2.9 (1.9–4.5)	2.8 (1.8–4.3)	3.1 (1.9–5.0)	1.9 (0.7–5.0)
Death by suicide	10/5	2.7 (1.5–5.0)	0.1 (0.1–0.3)	19.1 (6.5–55.9)	19.1 (5.8–62.9)	N/A	N/A
Death by cardiovascular disease	9/42	2.4 (1.3–4.7)	1.1 (0.8–1.4)	2.6 (1.2–5.4)	2.5 (1.2–5.3)	N/A	N/A
Death by neoplasm	8/38	2.2 (1.1–4.3)	1.0 (0.7–1.3)	2.1 (1.0–4.6)	2.1 (1.0–4.6)	N/A	N/A
Any psychiatric hospitalisation‡	64/173	19.0 (14.8–24.2)	4.2 (3.6–4.9)	4.2 (3.1–5.6)	2.8 (2.0–3.9)	3.0 (1.9–4.6)	2.5 (1.4–4.2)
Substance misuse	22/78	5.9 (3.9–8.9)	1.8 (1.5–2.3)	3.0 (1.9–4.9)	1.7 (1.0–3.1)	N/A	N/A
Suicide attempt	29/44	7.9 (5.5–11.4)	1.0 (0.8–1.4)	7.6 (4.7–12.4)	4.9 (2.9–8.5)	7.9 (4.1–15.3)	2.0 (0.7–5.3)
Any accident	32/233	9.0 (6.3–12.7)	5.7 (5.0–6.5)	1.6 (1.1–2.3)	1.4 (1.0–2.1)	1.6 (1.0–2.5)	1.1 (0.5–2.2)
Any crime	60/350	18.5 (14.3–23.8)	9.0 (8.1–10.0)	1.9 (1.4–2.5)	1.3 (1.0–1.8)	1.6 (1.1–2.4)	0.9 (0.6–1.5)
Violent crime	14/61	3.6 (2.1–6.1)	1.4 (1.1–1.8)	2.7 (1.5–4.9)	1.5 (0.8–3.0)	N/A	N/A

Notes:
*Adjusted for psychiatric morbidity prior to baseline and immigrant status.
‡Hospitalisations for gender identity disorder were excluded.
N/A Not applicable due to sparse data.
doi:10.1371/journal.pone.0016885.t002

separately lists the outcomes depending on when sex reassignment was performed: during the period 1973-1988 or 1989–2003. Even though the overall mortality was increased across both time periods, it did not reach statistical significance for the period 1989–2003. The Kaplan-Meier curve (Figure 1) suggests that survival of transsexual persons started to diverge from that of matched controls after about 10 years of follow-up. The cause-specific mortality from suicide was much higher in sex-reassigned persons, compared to matched controls. Mortality due to cardiovascular disease was moderately increased among the sex-reassigned, whereas the numerically increased risk for malignancies was borderline statistically significant. The malignancies were lung cancer (N = 3), tongue cancer (N = 1), pharyngeal cancer (N = 1), pancreas cancer (N = 1), liver cancer (N = 1), and unknown origin (N = 1).

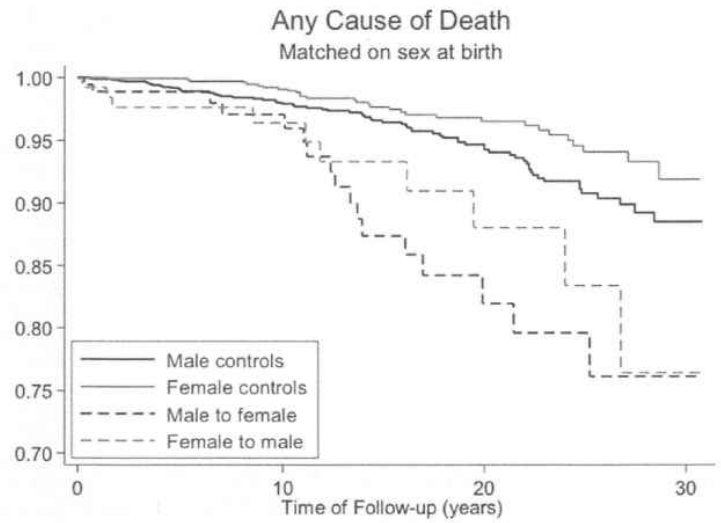


Figure 1. Death from any cause as a function of time after sex reassignment among 324 transsexual persons in Sweden (male-to-female: N = 191, female-to-male: N = 133), and population controls matched on birth year.
doi:10.1371/journal.pone.0016885.g001

Psychiatric morbidity, substance misuse, and accidents

Sex-reassigned persons had a higher risk of inpatient care for a psychiatric disorder other than gender identity disorder than controls matched on birth year and birth sex (Table 2). This held after adjustment for prior psychiatric morbidity, and was true regardless of whether sex reassignment occurred before or after 1989. In line with the increased mortality from suicide, sex-reassigned individuals were also at a higher risk for suicide attempts, though this was not statistically significant for the time period 1989–2003. The risks of being hospitalised for substance misuse or accidents were not significantly increased after adjusting for covariates (Table 2).

Crime rate

Transsexual individuals were at increased risk of being convicted for any crime or violent crime after sex reassignment (Table 2); this was, however, only significant in the group who underwent sex reassignment before 1989.

Gender differences

Comparisons of female-to-males and male-to-females, although hampered by low statistical power and associated wide confidence intervals, suggested mostly similar risks for adverse outcomes (Tables S1 and S2). However, violence against self (suicidal behaviour) and others ([violent] crime) constituted important exceptions. First, male-to-females had significantly increased risks for suicide attempts compared to both female (aHR 9.3; 95% CI 4.4–19.9) and male (aHR 10.4; 95% CI 4.9–22.1) controls. By contrast, female-to-males had significantly increased risk of suicide attempts only compared to male controls (aHR 6.8; 95% CI 2.1–21.6) but not compared to female controls (aHR 1.9; 95% CI 0.7–4.8). This suggests that male-to-females are at higher risk for suicide attempts after sex reassignment, whereas female-to-males maintain a female pattern of suicide attempts after sex reassignment (Tables S1 and S2).

Second, regarding any crime, male-to-females had a significantly increased risk for crime compared to female controls (aHR 6.6; 95% CI 4.1–10.8) but not compared to males (aHR 0.8; 95% CI 0.5–1.2). This indicates that they retained a male pattern regarding criminality. The same was true regarding violent crime. By contrast, female-to-males had higher crime rates than female controls (aHR 4.1; 95% CI 2.5–6.9) but did not differ from male controls. This indicates a shift to a male pattern regarding criminality and that sex reassignment is coupled to increased crime rate in female-to-males. The same was true regarding violent crime.

Discussion

Principal findings and comparison with previous research

We report on the first nationwide population-based, long-term follow-up of sex-reassigned transsexual persons. We compared our cohort with randomly selected population controls matched for age and gender. The most striking result was the high mortality rate in both male-to-females and female-to males, compared to the general population. This contrasts with previous reports (with one exception[8]) that did not find an increased mortality rate after sex reassignment, or only noted an increased risk in certain subgroups.[7,9,10,11] Previous clinical studies might have been biased since people who regard their sex reassignment as a failure are more likely to be lost to follow-up. Likewise, it is cumbersome to track deceased persons in clinical follow-up studies. Hence, population-based register studies like the present are needed to improve representativity.[19,34]

The poorer outcome in the present study might also be explained by longer follow-up period (median >10 years) compared to previous studies. In support of this notion, the survival curve (Figure 1) suggests increased mortality from ten years after sex reassignment and onwards. In accordance, the overall mortality rate was only significantly increased for the group operated before 1989. However, the latter might also be explained by improved health care for transsexual persons during 1990s, along with altered societal attitudes towards persons with different gender expressions.[35]

Mortality due to cardiovascular disease was significantly increased among sex reassigned individuals, albeit these results should be interpreted with caution due to the low number of events. This contrasts, however, a Dutch follow-up study that reported no increased risk for cardiovascular events.[10,11] A recent meta-analysis concluded, however, that data on cardiovascular outcome after cross-sex steroid use are sparse, inconclusive, and of very low quality.[34]

With respect to neoplasms, prolonged hormonal treatment might increase the risk for malignancies,[36] but no previous study has tested this possibility. Our data suggested that the cause-specific risk of death from neoplasms was increased about twice (borderline statistical significance). These malignancies (see Results), however, are unlikely to be related to cross-hormonal treatment.

There might be other explanations to increased cardiovascular death and malignancies. Smoking was in one study reported in almost 50% by the male-to females and almost 20% by female-to-males.[9] It is also possible that transsexual persons avoid the health care system due to a presumed risk of being discriminated.

Mortality from suicide was strikingly high among sex-reassigned persons, also after adjustment for prior psychiatric morbidity. In line with this, sex-reassigned persons were at increased risk for suicide attempts. Previous reports [6,8,10,11] suggest that transsexualism is a strong risk factor for suicide, also after sex reassignment, and our long-term findings support the need for continued psychiatric follow-up for persons at risk to prevent this.

Inpatient care for psychiatric disorders was significantly more common among sex-reassigned persons than among matched controls, both before and after sex reassignment. It is generally accepted that transsexuals have more psychiatric ill-health than the general population prior to the sex reassignment.[18,21,22,33] It should therefore come as no surprise that studies have found high rates of depression,[9] and low quality of life[16,25] also after sex reassignment. Notably, however, in this study the increased risk for psychiatric hospitalisation persisted even after adjusting for psychiatric hospitalisation prior to sex reassignment. This suggests that even though sex reassignment alleviates gender dysphoria, there is a need to identify and treat co-occurring psychiatric morbidity in transsexual persons not only before but also after sex reassignment.

Criminal activity, particularly violent crime, is much more common among men than women in the general population. A previous study of all applications for sex reassignment in Sweden up to 1992 found that 9.7% of male-to-female and 6.1% of female-to-male applicants had been prosecuted for a crime.[33] Crime after sex reassignment, however, has not previously been studied. In this study, male-to-female individuals had a higher risk for criminal convictions compared to female controls but not compared to male controls. This suggests that the sex reassignment procedure neither increased nor decreased the risk for criminal offending in male-to-females. By contrast, female-to-males were at a higher risk for criminal convictions compared to female controls and did not differ from male controls, which suggests increased crime proneness in female-to-males after sex reassignment.

Strengths and limitations of the study

Strengths of this study include nationwide representativity over more than 30 years, extensive follow-up time, and minimal loss to follow-up. Many previous studies suffer from low outcome ascertainment,[6,9,21,29] whereas this study has captured almost the entire population of sex-reassigned transsexual individuals in Sweden from 1973–2003. Moreover, previous outcome studies have mixed pre-operative and post-operative transsexual persons,[22,37] while we included only post-operative transsexual persons that also legally changed sex. Finally, whereas previous studies either lack a control group or use standardised mortality rates or standardised incidence rates as comparisons,[9,10,11] we selected random population controls matched by birth year, and either birth or final sex.

Given the nature of sex reassignment, a double blind randomized controlled study of the result after sex reassignment is not feasible. We therefore have to rely on other study designs. For the purpose of evaluating whether sex reassignment is an effective treatment for gender dysphoria, it is reasonable to compare reported gender dysphoria pre and post treatment. Such studies have been conducted either prospectively[7,12] or retrospectively,[5,6,9,22,25,26,29,38] and suggest that sex reassignment of transsexual persons improves quality of life and gender dysphoria. The limitation is of course that the treatment has not been assigned randomly and has not been carried out blindly.

For the purpose of evaluating the safety of sex reassignment in terms of morbidity and mortality, however, it is reasonable to compare sex reassigned persons with matched population controls. The caveat with this design is that transsexual persons before sex reassignment might differ from healthy controls (although this bias can be statistically corrected for by adjusting for baseline differences). It is therefore important to note that the current study is only informative with respect to transsexuals persons health after sex reassignment; no inferences can be drawn as to the effectiveness of sex reassignment as a treatment for transsexualism. In other words, the results should not be interpreted such as sex reassignment *per se* increases morbidity and mortality. Things might have been even worse without sex reassignment. As an analogy, similar studies have found increased somatic morbidity, suicide rate, and overall mortality for patients treated for bipolar disorder and schizophrenia.[39,40] This is important information, but it does not follow that mood stabilizing treatment or antipsychotic treatment is the culprit.

Other facets to consider are first that this study reflects the outcome of psychiatric and somatic treatment for transsexualism provided in Sweden during the 1970s and 1980s. Since then, treatment has evolved with improved sex reassignment surgery, refined hormonal treatment,[11,41] and more attention to psychosocial care that might have improved the outcome. Second, transsexualism is a rare condition and Sweden is a small country (9.2 million inhabitants in 2008). Hence, despite being based on a comparatively large national cohort and long-term follow-up, the statistical power was limited. Third, regarding psychiatric morbidity after sex reassignment, we assessed inpatient psychiatric care. Since most psychiatric care is provided in outpatient settings (for which no reliable data were available), underestimation of the *absolute* prevalences was inevitable. However, there is no reason to believe that this would change the *relative risks* for psychiatric morbidity unless sex-reassigned transsexual individuals were more likely than matched controls to be admitted to hospital for any given psychiatric condition.

Finally, to estimate start of follow-up, we prioritized using the date of a gender identity disorder diagnosis *after* changed sex status over *before* changed sex status, in order to avoid overestimating person-years at risk after sex-reassignment. This means that adverse outcomes might have been underestimated. However, given that the median time lag between the hospitalization before and after change of sex status was less than a year (see Methods), this maneuver is unlikely to have influenced the results significantly. Moreover, all deaths will be recorded regardless of this exercise and mortality hence correctly estimated.

Conclusion

This study found substantially higher rates of overall mortality, death from cardiovascular disease and suicide, suicide attempts, and psychiatric hospitalisations in sex-reassigned transsexual individuals compared to a healthy control population. This highlights that post surgical transsexuals are a risk group that need long-term psychiatric and somatic follow-up. Even though surgery and hormonal therapy alleviates gender dysphoria, it is apparently not sufficient to remedy the high rates of morbidity and mortality found among transsexual persons. Improved care for the transsexual group after the sex reassignment should therefore be considered.

Supporting Information

Table S1 Risk of various outcomes in sex-reassigned persons in Sweden compared to population controls matched for birth year and *birth sex*.
(DOCX)

Table S2 Risk of various outcomes in sex-reassigned persons in Sweden compared to controls matched for birth year and *final sex*.
(DOCX)

Author Contributions

Conceived and designed the experiments: CD PL AJ NL ML. Performed the experiments: MB AJ. Analyzed the data: CD PL MB AJ NL ML. Contributed reagents/materials/analysis tools: PL NL AJ. Wrote the paper: CD PL MB AJ NL ML.

References

1. World Health Organization (1993) The ICD-10 Classification of Mental and Behavioural Disorders. Diagnostic criteria for research. Geneva: WHO.
2. American Psychiatric Association, ed (1994) Diagnostic and Statistical Manual of Mental Disorders. Washington, DC: APA.
3. Meyer W, Bockting W, Cohen-Kettenis P, Coleman E, DiCeglie D, et al. (2002) The Harry Benjamin International Gender Dysphoria Association's Standards of Care for Gender Identity Disorders, Sixth Version. Journal of Psychology & Human Sexuality 13: 1–30.
4. Cohen-Kettenis PT, Gooren LJG (1999) Transsexualism: A review of etiology, diagnosis and treatment. J Psychosom Res 46: 315–333.
5. Wålinder J, Thuwe I (1975) A social-psychiatric follow-up study of 24 sex-reassigned transsexuals. Göteborg, Sweden: Scandinavian University Books.
6. Eldh J, Berg A, Gustafsson M (1997) Long-term follow up after sex reassignment surgery. Scand J Plast Reconstr Surg Hand Surg 31: 39–45.
7. Johansson A, Sundbom E, Höjerback T, Bodlund O (2010) A five-year follow-up study of Swedish adults with gender identity disorder. Arch Sex Behav 39: 1429–1437.
8. Sorensen T, Hertoft P (1982) Male and female transsexualism: the Danish experience with 37 patients. ArchSex Behav 11: 133–155.
9. De Cuypere G, T'Sjoen G, Beerten R, Selvaggi G, De Sutter P, et al. (2005) Sexual and physical health after sex reassignment surgery. Arch Sex Behav 34: 679–690.
10. van Kesteren PJ, Asscheman H, Megens JA, Gooren LJ (1997) Mortality and morbidity in transsexual subjects treated with cross-sex hormones. Clin Endocrinol Oxf 47: 337–342.

11. Gooren LJ, Giltay EJ, Bunck MC (2008) Long-term treatment of transsexuals with cross-sex hormones: extensive personal experience. J Clin Endocrinol Metab 93: 19–25.
12. Smith YL, van Goozen SH, Cohen-Kettenis PT (2001) Adolescents with gender identity disorder who were accepted or rejected for sex reassignment surgery: a prospective follow-up study. J Am Acad Child Adolesc Psychiatry 40: 472–481.
13. Smith YL, Van Goozen SH, Kuiper AJ, Cohen-Kettenis PT (2005) Sex reassignment: outcomes and predictors of treatment for adolescent and adult transsexuals. Psychol Med 35: 89–99.
14. Leavitt F, Berger JC, Hoeppner JA, Northrop G (1980) Presurgical adjustment in male transsexuals with and without hormonal treatment. J Nerv Ment Dis 168: 693–697.
15. Cohen Kettenis PT, van Goozen SH (1997) Sex reassignment of adolescent transsexuals: a follow-up study. J Am Acad Child Adolesc Psychiatry 36: 263–271.
16. Newfield E, Hart S, Dibble S, Kohler L (2006) Female-to-male transgender quality of life. Qual Life Res 15: 1447–1457.
17. Landén M, Wålinder J, Hambert G, Lundström B (1998) Factors predictive of regret in sex reassignment. Acta Psychiatrica Scandinavica 97: 284–289.
18. Hepp U, Kraemer B, Schnyder U, Miller N, Delsignore A (2005) Psychiatric comorbidity in gender identity disorder. J Psychosom Res 58: 259–261.
19. Murad MH, Elamin MB, Garcia MZ, Mullan RJ, Murad A, et al. (2010) Hormonal therapy and sex reassignment: a systematic review and meta-analysis of quality of life and psychosocial outcomes. Clin Endocrinol (Oxf) 72: 214–231.
20. Landén M, Wålinder J, Lundström B (1996) Incidence and sex ratio of transsexualism in Sweden. Acta Psychiatrica Scandinavica 93: 261–263.
21. Lobato MI, Koff WJ, Manenti C, da Fonseca Seger D, Salvador J, et al. (2006) Follow-up of sex reassignment surgery in transsexuals: a Brazilian cohort. Arch Sex Behav 35: 711–715.
22. Bodlund O, Kullgren G (1996) Transsexualism-General outcome and prognostic factors. A five year follow-up study of 19 transsexuals in the process of changing sex. Arch Sex Behav 25: 303–316.
23. Lindemalm G, Körlin D, Uddenberg N (1986) Long-term follow-up of "sex change" in 13 male-to-female transsexuals. Arch Sex Behav 15: 187–210.
24. Rauchfleisch U, Barth D, Battegay R (1998) [Results of long-term follow-up of transsexual patients]. Nervenarzt 69: 799–805.
25. Kuhn A, Bodmer C, Stadlmayr W, Kuhn P, Mueller MD, et al. (2009) Quality of life 15 years after sex reassignment surgery for transsexualism. Fertil Steril 92: 1685–1689 e1683.
26. Zimmermann A, Zimmer R, Kovacs L, Einodshofer S, Herschbach P, et al. (2006) [Transsexuals' life satisfaction after gender transformation operations]. Chirurg 77: 432–438.
27. Rehman J, Lazer S, Benet AE, Schaefer LC, Melman A (1999) The reported sex and surgery satisfactions of 28 postoperative male-to- female transsexual patients. Arch Sex Behav 28: 71–89.
28. Hepp U, Klaghofer R, Burkhard-Kubler R, Buddeberg C (2002) [Treatment follow-up of transsexual patients. A catamnestic study]. Nervenarzt 73: 283–288.
29. Lawrence AA (2003) Factors associated with satisfaction or regret following male-to-female sex reassignment surgery. Arch Sex Behav 32: 299–315.
30. Kaube H, Biemer E (1991) [Results of sex change operations in 30 transsexual patients: psychosocial and sexual adaptation–surgical complications]. Handchir Mikrochir Plast Chir 23: 276–278.
31. Dolmén L (2001) Brottsligheten i olika länder (Criminality in different countries). Stockholm: Brottsförebyggande rådet (the Swedish National Council for Crime Prevention).
32. Fazel S, Grann M (2006) The population impact of severe mental illness on violent crime. Am J Psychiatry 163: 1397–1403.
33. Landén M, Wålinder J, Lundström B (1998) Clinical characteristics of a total cohort of female and male applicants for sex reassignment: a descriptive study. Acta Psychiatrica Scandinavica 97: 189–194.
34. Elamin MB, Garcia MZ, Murad MH, Erwin PJ, Montori VM (2010) Effect of sex steroid use on cardiovascular risk in transsexual individuals: a systematic review and meta-analyses. Clin Endocrinol (Oxf) 72: 1–10.
35. Landén M, Innala S (2000) Attitudes toward transsexualism in a Swedish national survey. Archives of Sexual Behavior 29: 375–388.
36. Mueller A, Gooren L (2008) Hormone-related tumors in transsexuals receiving treatment with cross-sex hormones. Eur J Endocrinol 159: 197–202.
37. Vujovic S, Popovic S, Sbutega-Milosevic G, Djordjevic M, Gooren L (2009) Transsexualism in Serbia: a twenty-year follow-up study. J Sex Med 6: 1018–1023.
38. Rehman J, Lazer S, Benet AE, Schaefer LC, Melman A (1999) The reported sex and surgery satisfactions of 28 postoperative male-to-female transsexual patients. Arch Sex Behav 28: 71–89.
39. Osby U, Brandt L, Correia N, Ekbom A, Sparen P (2001) Excess mortality in bipolar and unipolar disorder in Sweden. Arch Gen Psychiatry 58: 844–850.
40. Tidemalm D, Langstrom N, Lichtenstein P, Runeson B (2008) Risk of suicide after suicide attempt according to coexisting psychiatric disorder: Swedish cohort study with long term follow-up. Bmj 337: a2205.
41. Toorians AW, Thomassen MC, Zweegman S, Magdeleyns EJ, Tans G, et al. (2003) Venous thrombosis and changes of hemostatic variables during cross-sex hormone treatment in transsexual people. J Clin Endocrinol Metab 88: 5723–5729.

Table S1. Risk of various outcomes in sex-reassigned subjects in Sweden compared to population controls matched for birth year and *birth sex*.

		Crude hazard ratio (95% CI)			Adjusted* hazard ratio (95% CI)		
Outcome	**No. of events (male-to-female/female-to-male)**	**All sex-reassignment persons (N=324)**	**Male-to-female only (N=191)**	**Female-to-male only (N=133)**	**All sex-reassignment persons (N=324)**	**Male-to-female only (N=191)**	**Female-to-male only (N=133)**
Any death	27 (17/10)	2.9 (1.9-4.5)	2.6 (1.5-4.5)	3.7 (1.8-7.7)	2.8 (1.8-4.3)	2.4 (1.4-4.1)	3.8 (1.8-7.9)
Death by suicide	10 (6/4)	19.1 (6.5-55.9)	13.9 (3.9-49.6)	40.0 (4.5-357.9)	N/A	N/A	N/A
Death by cardiovascular disease	9 (6/3)	2.6 (1.2-5.4)	2.3 (0.9-5.7)	3.2 (0.9-11.9)	N/A	N/A	N/A
Death by neoplasm	8 (4/4)	2.1 (1.0-4.6)	1.7 (0.6-4.9)	2.8 (0.9-8.5)	N/A	N/A	N/A
Any psychiatric hospitalisation‡	64 (43/21)	4.2 (3.1-5.6)	4.7 (3.2-6.7)	3.4 (2.1-5.6)	2.8 (2.0-3.9)	3.2 (2.1-4.9)	2.2 (1.3-4.0)
Substance misuse	22 (14/8)	3.0 (1.9-4.9)	2.8 (1.6-5.1)	3.5 (1.6-7.8)	1.7 (1.0-3.1)	1.5 (0.7-3.1)	2.3 (0.9-5.8)
Suicide attempt	29 (22/7)	7.6 (4.7-12.4)	15.4 (7.9-30.2)	2.9 (1.3-6.8)	4.9 (2.9-8.5)	10.4 (4.9-22.1)	1.9 (0.7-4.8)
Any accident	32 (19/13)	1.6 (1.1-2.3)	1.4 (0.9-2.2)	1.9 (1.0-3.4)	1.4 (1.0-2.1)	1.2 (0.7-2.0)	1.8 (1.0-3.3)
Any crime	60 (33/27)	1.9 (1.4-2.5)	1.2 (0.8-1.7)	5.6 (3.5-9.1)	1.3 (1.0-1.8)	0.8 (0.5-1.2)	4.1 (2.5-6.9)
Violent crime	14 (8/6)	2.7 (1.5-4.9)	1.8 (0.8-3.7)	9.9 (3.2-30.7)	1.5 (0.8-3.0)	0.8 (0.3-2.1)	7.2 (2.1-24.4)

Notes: N/A Not applicable due to sparse data. *Adjusted for immigrant status and psychiatric morbidity up to baseline. ‡ Hospitalisations for gender identity disorder were excluded.