EXHIBIT 39

SUBMITTED UNDER SEAL

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

BRIANNA BOE, et al,
Plaintiffs,
and
UNITED STATES OF AMERICA,
Intervenor Plaintiff,
vs. Civil Case No. 2:22-cv-184-LCB
HON. STEVE MARSHALL, in his
official capacity as Attorney General
of the State of Alabama, et al,
Defendants.
_____

The Remote Zoom Videoconference Deposition of
DANIEL SHUMER, M.D.,
Taken at 211 West Fort Street, Room 2330,
Detroit, Michigan,
Commencing at 9:11 a.m.,
Tuesday, April 2, 2024,
Before Leisa M. Pastor, CSR-3500, RPR, CRR.

APPEARANCES:

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ALSO PRESENT:
George Plow

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EXHIBITS

Detroit, Michigan
Tuesday, April 2, 2024
9:11 a.m.

DANIEL SHUMER, M.D.,
was thereupon called as a witness herein, and after having first been duly sworn to testify to the truth, the whole truth and nothing but the truth, was examined and testified as follows:

MS. WILLIAMS: Renee Williams, United States.

MS. MONTAG: Coty Montag, United States.

EXAMINATION

BY MR. MILLS:

Q. Good morning, Dr. Shumer. Thanks for coming today. You've given deposition testimony before, right?

A. Yes.

MS. WILLIAMS: Oh, sorry, just before we get started, we would like the -- to be able to reserve and to read and sign, if that's okay.

MR. MILLS: Sounds good.

MS. WILLIAMS: All right.

MR. MILLS: Anything else we need to cover?

MS. WILLIAMS: I don't think so.

MR. MILLS: Okay. If we discuss any sealed

material, we'll designate those parts as sealed, but we can get to that when we get there.

BY MR. MILLS:

Q. So yeah, of course if you don't understand a question, please free to ask for me to clarify. If you need a break, just let me know. We'll aim to take regular breaks, but also know that people would like to get home, so I'll try and balance those things.

If you could remember to answer verbally so the transcription can happen, that would be great.

Did you meet with anyone to prepare for today's deposition?

A. I met with Renee and Coty here.

Q. Did you discuss the deposition with anyone other than your counsel?

A. No.

Q. And did you review any documents in preparation for today's deposition?

A. Yes. I reviewed my expert report and rebuttal report and the defendant expert reports and -- yeah.

Q. Okay. Is it fair to say that you think the Endocrine Society is a reputable organization?

A. Yes.

Q. Do you generally follow the Endocrine Society's guidelines?

A. Yes.

Q. Is it fair to say you agree with or follow the Endocrine Society's approach to medical gender transition of minors?

MS. WILLIAMS: Objection.

A. Yes.

MARKED FOR IDENTIFICATION:
EXHIBIT 1
9:13 a.m.

BY MR. MILLS:

Q. I'm going to show you what I'm marking as Exhibit 1. Do you recognize this article?

A. Yes.

Q. This is an article you coauthored; is that right?

A. That's correct.

Q. And you were the lead author on this article?

A. Yes.

Q. And it was published in the Journal of Advanced Pediatrics; is that --

(Knock at the door.)

MS. WILLIAMS: Can we go off?

MR. MILLS: Sure.

(Off the record at 9:14 a.m.)

(On the record at 9:14 a.m.)

BY MR. MILLS:

Q. Okay. We can go back on, sorry.

So this was published in Advanced Pediatrics?

A. I'm not sure if that's the title of the article. I think it might be Advances in Pediatrics.

Q. Okay. Okay, I think you're right. Okay, perfect. Thanks.

If you could look at page 2 with me just under the heading "Definitions." It says the first sentence, "Gender identity describes one's internal feeling of gender, for example, boy or girl, man or woman, agender (identifying as having no gender), or a nonbinary understanding of one's gender."

Do you still agree with that definition?

A. Yes.

MARKED FOR IDENTIFICATION:
EXHIBIT 2
9:15 a.m.

BY MR. MILLS:

Q. Okay. I wanted to show you -- this was -- I'm handing you what I'm marking as Exhibit 2. This is a question and answer you did with -- through the University of Michigan Medical School; is that right?

A. Yes.

Q. Could you look at page 1 under the bold "What is the

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difference between sex and gender," the second sentence, "Gender identity is something you can't measure with a blood test or x-ray. It's only something a person can tell you about themselves from their lived experience."

Do you still agree with that description?

A. Yes.

Q. You can go back to the first document again under "Definitions." This is the next sentence after the one we already read.

"This is in contrast to biologic sex which describes the chromosomal, hormonal, and anatomic determinants which result in characterizing people as male or female."

Do you still agree with that?

A. Yes, but I would add that due to the biologic underpinnings of gender dysphoria, I would include gender dysphoria as a component of sex.

Q. So you don't think that gender identity is in contrast to biologic sex any more?

A. So I think that the -- the definition of gender identity is -- is an internal sense of one's self as outlined here, boy, girl, man, or woman, agender or nonbinary.

If I were writing this paragraph again, I

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don't think I would use the words "in contrast," and I would include gender identity as a component of biologic sex.

Q. Has something changed since you wrote this in 2017 that would lead you to change that description?

A. Yes, my understanding of gender identity as -- as having biologic underpinnings.

Q. And what is the basis for that change in understanding?

A. Research outlining those biologic relationships between gender identity, and research outlining the biologic underpinnings of gender identity, including twin studies, studies related to children with disorders of sex development, studies related to population-based brain anatomic differences.

Q. And which studies in particular have come out since this was published in August 2017 that would support that description?

A. I think many of the studies that are related to those topics that I outlined came out before 2016; however, my thinking through these topics and understanding how gender identity and sex are related and intertwined has changed.

Q. Okay. I'm going to show you now what I'm marking as Exhibit 3.

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MARKED FOR IDENTIFICATION:
EXHIBIT 3
9:19 a.m.

BY MR. MILLS:

Q. This is a scientific statement from the Endocrine Society.

Endocrinology is your specialty, right?

A. Yes.

Q. And we've already talked about the Endocrine Society. Do you recognize the names, any of the names who coauthored this statement?

A. I'm familiar with a couple of the names.

Q. If you could look at page 2 with me the first paragraph under the line kind of in the middle of the page. Yeah, page 2.

It says, "Sex is an important biological variable that must be considered in the design and analysis of human and animal research. The terms sex and gender should not be used interchangeably. Sex is dichotomous with sex determination in the fertilized zygote stemming from unequal expression of sex" --

COURT REPORTER: Can you slow down just a hair, please?

MR. MILLS: Sure.

COURT REPORTER: You lost me at zygote.

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BY MR. MILLS:

Q. "Sex is dichotomous with sex determination in the fertilized zygote stemming from unequal expression of sex chromosomal genes."

Did I read that correctly?

A. Yes.

Q. What does dichotomous mean?

A. I would -- I would say dichotomous means two and separate.

Q. And do you agree that sex is determined in the fertilized zygote?

A. I think that they're referring to chromosomal sex, and if they're -- if my assumption is correct, then I would agree with that.

Q. So you agree that sex is dichotomous?

A. I don't -- I don't know that I agree with -- with that specifically. I agree with it when talking about chromosomal sex being XX or XY predominantly, but I think saying that sex is dichotomous misses some of the nuance of how sex can be more complicated.

Q. If you could flip to page 10 of this document. On the second column, the last paragraph starts with, "Sex is an essential part of vertebrate biology, but gender is a human phenomenon. Sex often influences gender, but gender cannot influence sex."

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Would you agree with that statement?
A. Well, there's a lot of parts of that, so let me try to break it down.
Gender is a human phenomenon. I agree that humans have gender identity. I'm not sure if other animals have gender identity, so I think that I would agree with that.
Sex often influences gender. I think that makes sense to me.
Gender cannot influence sex, I think that -- to me that means that someone's gender identity doesn't influence the other components of sex, so in that way I would agree, but I would also put forward that my definition of sex includes gender identity as a component.
Q. So you would say this statement is wrong because it just says outright gender cannot influence sex?
A. No, that's not what I said. I don't think that gender identity can influence the other components of sex so I wouldn't disagree with that.
Q. But you would agree this statement doesn't say "other components," it just says "sex"?
A. I agree that it doesn't say "other components."
Q. So you wouldn't have written this like it's written?
A. I don't think I would have.

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Q. If you could flip to page 8, near the top of the first column, the second sentence, "Gender identity is a psychological concept that refers to an individual's self perception."
Do you agree with that statement?
A. Yes.
Q. I wanted to go back to Exhibit 1, which was your article in the Advances in Pediatrics. This is on page 5. At the end of the second to last paragraph the last sentence says, "Yet, the vast majority of transgender persons do not have an identified DSD or endocrinopathy."
Did I say that right?
A. You did.
Q. A DSD refers to a disorder of sexual development?
A. That's correct.
Q. And what does endocrinopathy mean?
A. An endocrine disorder.
Q. And so do you agree with this statement that the vast majority of transgender persons do not have either one?
A. Yes.
Q. So when you treat transgender persons with gender dysphoria, you are not typically treating for a DSD, correct?

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A. That's correct.
Q. And gender dysphoria is not a DSD?
A. That's correct.
Q. Transgender status is not a DSD, correct?
A. That's correct.
Q. And when you treat transgender patients with gender dysphoria, you are not treating an endocrine disorder; is that right?
A. That's correct. Well, I would say that I'm treating a disorder with hormones. So whether we call that an endocrine disorder or not, they don't have -- typically they don't have an abnormality in their sex hormone production as it relates to their sex assigned at birth.
Q. But transgender status is not an endocrine disorder, correct?
MS. WILLIAMS: Objection.
A. I think that -- that the semantics there are hard for me to parse out. You know, I think it's a disorder that endocrinologists treat. We treat it with hormonal interventions, so whether it's called an endocrine disorder or not, you know, I think is not important.
BY MR. MILLS:
Q. But in 2017, you wrote the vast majority of

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transgender persons do not have an endocrinopathy, or as you said, an endocrine disorder, so are you changing your view on that since 2017?
A. No, I'm saying in this article that we're not treating hormonal perturbation or a hormone problem. An endocrinologist is treating transgender people with hormones, so whether we call that an endocrine problem or not, I think that could be open for debate.
Dismissing that transgender status is an endocrine problem out of hand I think misses the larger point that endocrinologists treat transgender people with gender dysphoria.
Q. And gender dysphoria is not an endocrine disorder?
A. No.
Q. The Endocrine Society's statement we looked at a minute ago refer to different levels of sex steroids.
What is the typical level of testosterone in an adult male?
A. Typical level of testosterone in an adult male is roughly 200 to 900 nanograms per deciliter.
Q. What about the typical level of estrogen in an adult male?
A. It's low, less than 30 picograms per deciliter, if I'm getting my units correct.
Q. And what is the typical level of estrogen in an adult

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female?
A. The typical level of estrogen in an adult female varies through the month, but it can be between 50 and 300 picograms per deciliter.
Q. And what is the typical level of testosterone in an adult female?
A. Generally I would say less than 40 nanograms per deciliter.
Q. And do these levels that you've just said assume any medical treatments?
A. These are typical normal ranges for biologic men and women not on medical treatments.
Q. So assuming no medical treatment, still is the typical testosterone level of an adult transgender woman the same as an adult natal male?
A. It likely would be.
Q. Is that also true of estrogen?
A. Yes.
Q. And is the typical estrogen level of an adult transgender male the same as an adult natal female?
A. I would expect it to be.
Q. And that's also true of testosterone?
A. Yes.
Q. So those typical levels are manifestations of the person's biological sex; is that right?

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A. Yes.
Q. Is there a typical level of those two sex steroids, testosterone and estrogen, in transgender adults?
A. So did we just answer that for untreated transgender adults?
Q. Mm-hmm.
A. Yes.
Q. So the -- I'll ask it a different way.
The typical level of those two sex steroids in transgender adults would depend on whether they've been treated with hormones; is that fair to say?
A. The goal of treatment in someone being treated with hormones for gender dysphoria would be to bring their hormone levels in line with that which is typical of other people of that sex.
Q. Okay. I'm going to show you what I'm marking as Exhibit 4.
MARKED FOR IDENTIFICATION:
EXHIBIT 4
9:31 a.m.
BY MR. MILLS:
Q. This is an article you published with some others, is that right, concerning transgender youth?
A. Yes.
Q. If you could flip to page 2 at the top with me. This

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is about the third sentence down.
"The term transgender typically refers to those individuals for whom genotype and phenotype are mismatched, therefore, biologically male children may self-identify as female and vice versa, or youth may not fit neatly into either category."
Do you understand the term transgender to include youth who, as you sit here, do not fit neatly into either category?
A. I think generally transgender is an umbrella term to define someone whose gender identity does not match their sex assigned at birth.
Q. So a person who considers them self nonbinary could be transgender; is that right?
A. Yes.
Q. And a person who considers them self agender could be transgender?
A. Yes.
Q. And a person who considers themselves gender queer could be transgender?
A. Yes.
Q. So if you want to flip to page 8 in that same document with me.
COURT REPORTER: If you could hold on for one second, somebody rang in here.

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It's okay.
BY MR. MILLS:
Q. So we're on page 8 just before the heading toward the bottom, this is the second to last sentence before the "Challenges and Dilemma" heading.
"We also want to ensure that the child adolescent who may be gender variant does not feel compelled to choose a gender male/female when in actuality they may not fit into a typically recognized gender identity."
So some youth with divergent gender identities may not have the opposite identity as their biological sex; is that right?
A. Although most patients that I see do identify as the other sex, there are some individuals that identify somewhere -- somewhere else on a gender spectrum.
Q. How many gender identities would you say there are?
A. I don't think of gender identity in that way to count gender identities. Gender identity is a concept of knowing oneself and one's gender.
Q. If you could flip back to the Endocrine Society's scientific statement, this is what we marked as Exhibit 3, with me, and I'm going to page 9 of this document. This is the "Endocrine Society considering sex as a biological variable," page 9, and looking at

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the start of the first full paragraph in the first column.

"Although gender is strongly influenced by environmental and cultural forces, it is unknown if the choice to function in society in male/female or other roles is also affected by biological factors."

Do you agree that gender is strongly influenced by environmental and cultural forces?

A. So I'm not sure if they're referring to gender identity here or gender as a concept. So if you're asking me to agree with this sentence, I'm not sure that I -- that I can based on -- on -- on that, but I would say that -- that I don't believe gender identity to be strongly influenced by environmental or cultural forces.

Q. Do you think gender identity is influenced at all by environmental and cultural forces?

MS. WILLIAMS: Objection.

A. I think that individuals likely have an innate gender identity, and the understanding of that gender identity can be influenced by the world around us.

BY MR. MILLS:

Q. Do you agree that it is unknown if the choice to function in society in male/female or other roles is also affected by biological factors?

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A. I presented data to support the notion that gender identity is impacted by biologic factors. The choice to function in society as male/female or other roles, I'm not sure what that -- what that means exactly in this sentence, but I -- I presented data to support the notion that gender identity itself has biologic foundation.

Q. If we could flip back to Exhibit 1. This is your article in the Advances in Pediatrics, page 5 in the middle of the page. This is at the end of the second full paragraph.

You say, "Studies have failed to firmly establish causative gains." And then if we could flip back to the Endocrine Society's statement that's Exhibit 3 that we were just looking at, back to page 8. This is in the second sentence in the first column on page 8 starting halfway through the sentence.

"While associations between gender identity, neuroanatomic, genetic and hormone levels exist, a clear causative biologic underpinning of gender identify remains to be demonstrated."

Do you agree that a clear causative underpinning of gender identity remains to be demonstrated?

A. I agree that we don't have biologic variable that

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clearly causes a certain change in gender identity, yes.

That the associations that I presented are not intended to demonstrate that a certain gene is causing a change in gender identity or a particular exposure, a particular hormonal exposure is causing gender identity, but simply that there's relationship between these biologic variables and gender identity.

Q. But you don't disagree with the way this scientific statement words the absence of a clear causative biological underpinning, correct?

A. I'm reading that to say -- to mean that exactly how I just presented it, that there's not a clear cause for -- there wouldn't be a situation where you can measure something like a genetic variable or a hormonal exposure and then be able to predict one's gender identity, so in that way I would agree.

Q. And along the same lines, so you don't know with certainty what causes gender identity; is that right?

A. Correct.

Q. I'm going to show you now what I'm marking as Exhibit 5, which is an article you published with some others called "Autistic traits in mothers and children associated with children gender nonconformity."

MARKED FOR IDENTIFICATION:

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EXHIBIT 5

9:40 a.m.

BY MR. MILLS:

Q. Do you recall this article?

A. Yes.

Q. If you could just flip to page 2 of the article, and this is near the end, the second to last sentence of the big paragraph toward the bottom of the page.

You wrote, "Postnatal" -- "In addition, postnatal and environmental factors such as the social relationship between the parent and infant and cognitive learning about parental expectations and societal norms may influence gender development."

Do you still agree that postnatal environmental factors may influence gender identity?

A. Well, I said development, so I think I would agree with that.

Q. And could you explain what the difference between gender development and gender identity is?

A. Sure. So I -- I think that we've -- we've defined gender identity as an internal sense of one's self as boy, girl, man, woman, and I would describe gender development as the -- the progress of understanding gender as one grows from infancy to toddlerhood to childhood to adolescence to adulthood.

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Q. So a factor that influences gender development would necessarily influence gender identity; is that right?
A. I don't know. I think the -- the point here is that gender identity is a really complicated human characteristic that probably has lots of different inputs and factors.
The -- the factors here, the relationship between parent and infant, cognitive learning, parental expectations and societal norms, may they influence gender identity? I think it's possible. I think that we have a -- a -- we have a really complicated human characteristic here that -- that is incompletely understood, but -- but the assertion that there's biologic factors that are related to it remains -- remains clear.
Q. If the postnatal environment is important in gender development, do you agree that it is desirable to structure that environment in such a way that a child becomes comfortable with their natal sex so they don't have to undergo medical gender transition?
MS. WILLIAMS: Objection.
A. I think in the best case scenario a child would understand that whatever their gender identity is would be met with love and support.
BY MR. MILLS:

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Q. I'm going to show you what I'm marking as Exhibit 6, which is an article you coauthored entitled "Transgender and gender nonconforming adolescent care, psychosocial and medical considerations."
MARKED FOR IDENTIFICATION:
EXHIBIT 6
9:43 a.m.
BY MR. MILLS:
Q. This was an article you coauthored; is that right, Dr. Shumer?
A. Yes.
Q. If you could look at page 2, the second paragraph under "Gender Identity," the second paragraph there, the second sentence.
"For example, a prepubertal child who is gender nonconforming or has apparent gender dysphoria may or may not identify as transgender later in life."
Would you still agree with that statement?
A. Yes.
Q. So some children with gender dysphoria will identify with their biological sex later in life?
A. Yes.
Q. Sorry, I'm just getting back to where we are.
If we could flip back to the Endocrine Society scientific statement, this is Exhibit 3, and

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if you'd go to page 9, the bottom of the first column.
The very bottom of the first column says, "Attempts to identify specific genes governing gender identity have been plagued by small numbers of subjects and low statistical significance."
Do you agree with that statement?
A. I would -- I would just back up for a second and put this in context because the sentence before says genetics may play a role in gender identity.
Monozygotic twins have a 39 percent concordance for gender dysphoria, which I think references one of the articles that I included in my expert report. So the following sentence that you read I would agree is that those studies that -- that highlight that point are relatively small, and so further study to help understand the genetics of gender identify would certainly be helpful.
Q. And if it were purely genetic, monozygotic twins would have a 100 percent concordance for gender dysphoria; is that right?
A. Yeah, I think I tried to explain this in more detail in my rebuttal report, but there are certain medical conditions that we would call Mendelian traits which involve a specific gene, and one -- one gene when -- when mutated, for example, or -- or when there's a

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certain allele will 100 percent of the time express that condition.
So, for example, Huntington's disease is a Mendelian trait where you have that gene 100 percent of the time you'll have Huntington's disease, but many human characteristics while there is a genetic link are not 100 percent, you know, gene equals outcome.
Q. Sure. So the next sentence here is, "No specific gene has been reproducibly identified."
Would you agree with that?
A. Correct. There's not a specific gene when mutated a certain way or when a certain allele is present would be 100 percent predictive of a certain difference or lack of difference in gender identity.
Q. So if we go up to the second sentence in the big paragraph in the first column on page 9 it says, "A general issue is that the association of sex, gender or sexual orientation with specific brain structures or with other biological variables does not establish whether the biological variables are causes or consequences or noncausal correlates of the behavioral contribution or function of the individuals studied."
Do you agree that that issue remains sort of an open question in the studies you discussed?
A. So that's a complicated question, so let me just try

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to -- to go through that with you.
So a general issue is the -- that the association of sex, gender and sexual orientation with specific brain structures or with other biologic variables does not establish whether the biological variables are causes or consequences or noncausal correlates of the behavioral characteristic or function of the individuals studied to me is pointing out that you could have a, let's say, a biologic difference that exists in transgender people, and the question is, is that biologic difference the cause of the gender identity or is the gender identity somehow causing that biologic difference or in something to that effect. So I think with each study you have to think about the plausibility of that and think about whether that could be true.
I think for the monozygotic twin studies, it's harder for me to understand how the gender identity could impact the genetic differences. I think, you know, when we're talking about other studies that -- that I referenced in my report, I think each time we'd have to think about how that could be and not discount it out of hand that -- that the cause and effect could be one way versus the other.

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So if we -- if we take individual studies, we could try to answer that question more -- more specifically.
Q. But you agree that this could be an issue with specifically the brain studies?
A. So I think this comes up a lot in -- in -- in brain studies where, let's say, there's a difference in a brain structure in someone with a certain characteristic, is that -- is there something that caused that difference that is also attributed to the condition we're talking about, or is -- is the causation the other way around. And so that could be something that you would need to think about with brain studies.
And -- and so, you know, when we're thinking about gender identity as this variable, you know, I think, you know, whether or not the difference occurred after hormone exposure or before, those sorts of questions would be important to think through when you're trying to understand the importance of the study in answering your question.
MARKED FOR IDENTIFICATION:
EXHIBIT 7
9:51 p.m.
BY MR. MILLS:

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Q. I'm showing you what I'm marking as Exhibit 7, which is an article by a professor of psychology Kristina Olson.
Are you familiar with her work?
A. Yes.
Q. Sorry, I may have given you two copies; just ignore one of them.
Is she generally a knowledgeable person in this field of gender identity and gender dysphoria?
A. I don't know what area we're going to be talking about.
Q. And how are you familiar with her?
A. She -- she presented -- she published studies related to gender identity outcomes, I believe, related to social transition and comparing children with their peers and other unrelated -- unrelated age-matched controls, and that's how I'm most familiar with her work.
Q. I'm -- if you want to flip to page 6 of the page numbers that are at the bottom here, the first full paragraph the end of the paragraph says, "Whereas, the topic" -- sorry, I'll go back.
So this paragraph is talking about neuroscience studies about the brain structures of trans people. The end of the paragraph says,

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"Definitive conclusions about genetic and neural correlates of gender identity remain elusive."
Would you agree with that statement?
A. If you don't mind --
Q. Sure.
A. -- I'd just like to read the whole paragraph to myself --
Q. Of course.
A. -- for a second.
Yes, I think the whole paragraph nicely summarizes sort of a lot of the topics we've been talking about, how we have these differences that we've measured in the brains of transgender people, that forming a causative link is difficult in these types of studies, and so I certainly I don't disagree with the sentence that you read, and I would just add that, you know, by presenting -- bringing the study data in my expert report, I'm certainly not purporting a causative link to a certain size nuclei equals a certain gender identity, but rather using that to expand on the -- or to include it in the data that helps to demonstrate this biologic origin of gender identity.
Q. Do you agree that the brain studies you cited in your report analyzing gender identity did not control for

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sexual orientation?
A. I think that it would be helpful to look at them in detail, but I don't remember them controlling for sexual orientation.
Q. Sure, we can come back to that.
If you could flip to what I marked as Exhibit 2, which was the question and answers you gave with the Michigan --
A. Oh, I have two of these ones.
Q. Sorry about that; that was my fault.
Page 2 the second paragraph under the heading "What is gender-affirming care." This is the second paragraph under that heading.
"Not everyone with the difference in gender identity should be considered as having a medical problem or needing to see a doctor."
Do you still agree with that statement?
A. Yes.
Q. So a difference in gender identity would include an individual who's -- who is transgender, right?
A. Yes.
Q. So some transgender individuals should not be considered as having a medical problem or needing to see a doctor?
A. Yes.

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Q. I'd like to show you now what I'm going to mark as Exhibit 8 --
MARKED FOR IDENTIFICATION:
EXHIBIT 8
9:56 a.m.
BY MR. MILLS:
Q. -- which is a chapter that you wrote in a book entitled Transgender Medicine.
And do you recall this chapter?
A. Yes.
Q. Sorry, there's two pages of preliminary material, but then Chapter -- it looks like you were a coauthor of Chapter 9, entitled "Endocrine care of transgender children in adolescence"; is that right?
A. Yes.
Q. If you could flip to -- sorry, the pages are a little conflicting here -- page 166, which is the second page of your chapter; it just skips ahead to your chapter. There we go.
A. 166?
Q. That's right. And this is in the middle of the page you're defining the term transgender.
You wrote, "An umbrella term describing individuals who identify with a gender that is different from gender assigned at birth may or may not

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connote gender dysphoria or desire to seek an intervention."
So is it correct to say that some transgender persons do not have gender dysphoria?
A. Yes.
Q. And for transgender persons without gender dysphoria, medical gender transition would not be proper; is that right?
A. That's correct.
Q. Even for some transgender persons with gender dysphoria, medical gender transition might not be proper; is that right?
A. Sorry, can you way that one more time?
Q. Sure. So I'm talking about transgender persons with gender dysphoria, medical gender transition in the sense of puberty blockers and cross X hormones would not necessarily be the proper course of treatment; is that right?
A. In assessing anyone with gender dysphoria, medical transition would be considered as an option and may or may not be appropriate.
Q. Can individuals who do not identify as transgender have gender dysphoria?
A. Well, you said in an individual who does not identify as transgender, so I think to me that means that that

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person them self is applying that term transgender to their identity, so there may be -- may be a person that identifies as a sex different from their assigned sex at birth that eschews the term transgender and, therefore, wouldn't themselves state that they identify as transgender that have gender dysphoria, but in my definition of transgender, which is a person whose gender identity is different than their sex assigned at birth, then, no, someone would need to fit that definition to have gender dysphoria.
I'm not sure if I explained that.
Q. I think I understand. Thanks.
A. Yeah.
Q. So you would potentially treat an individual who does not identify as transgender but has gender dysphoria if you considered them to be transgender?
A. I don't think that -- I don't think of transgender as a medical term, so I'm really as a pediatric endocrinologist more interested if they have gender dysphoria.
Q. Do you diagnosis gender dysphoria under the DSM-5 without the input of a psychiatrist or psychologist or other mental health professional?
MS. WILLIAMS: Objection.
A. So there's a couple parts to that question. I

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certainly can and do diagnose gender dysphoria. The DSM is very clear on how one may -- can diagnose it, but in my clinical practice, I work as part of a multidisciplinary team where patients are also seeing a mental health professional, and that mental health professional is considering the diagnosis of gender dysphoria as well.

BY MR. MILLS:

Q. So have you ever diagnosed gender dysphoria and started medical treatment without the input of a mental health professional?

A. No, that's not how our clinic is set up to function.

Q. I'm going to show you what I'm marking as Exhibit 9.

MARKED FOR IDENTIFICATION:
EXHIBIT 9
10:01 a.m.

BY MR. MILLS:

Q. This is an article you coauthored entitled "Evaluation of Asperger's syndrome in youth presenting to a gender dysphoria clinic."

Do you recall this article?

A. Yes.

Q. And you were an author of it?

A. Yes.

Q. If you could just flip to page 389 of the article, and

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this is under "Discussion" in the first column, the second sentence.

"23 percent of patients presenting with gender dysphoria had possible likely or very likely Asperger's syndrome as measured by the ASDS," and then you say, "That is consistent with growing evidence of increased prevalence of ASD in gender dysphoric children."

ASD is Autism Spectrum Disorder; is that right?

A. Yes.

Q. And do you still agree that there's an increased prevalence of ASD in gender dysphoric children?

A. Yes.

Q. Near the bottom of that first column in the middle of the last paragraph you wrote, "The psychological evaluation performed" -- sorry, I'll start -- the first sentence of that last paragraph says, it talks about the evaluation and treatment of children and adolescents with gender dysphoria. You say it's guided by professional guidelines or standards of care, and then in the middle of the paragraph you say, "The psychological evaluation performed is not standardized with different clinics performing diverse batteries of psychological screening."

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Would you still agree that the psychological evaluation for gender dysphoria is not standardized?

A. Just to clarify, the end of that sentence was "testing." You said "screening."

Q. Oh, yes, sorry, sorry. Yes, you're right.

A. So I think that in general, pediatric -- pediatric patients with gender dysphoria are in our country generally treated in pediatric gender clinics which consist of a mental health component and assessment.

The -- the assessment performed in these clinics is all based on the premise that a diagnosis of gender dysphoria should be evaluated for, and that a biopsychosocial assessment, understanding of the child's gender history, the parent's perception of that gender journey, the child's social and educational history, developmental history. These are all important components of that assessment, in my opinion, and how that assessment is structured may look different depending on the resources of each clinic or the -- the tools that a mental health professional may employ to answer those questions.

Q. So just to go back, would you agree that the psychological evaluation you performed is not standardized?

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A. I would agree that there's not a cookie-cutter approach that every pediatric gender clinic follows to make this assessment, but the function of what's important, the important outcome of that assessment is similar across all gender clinics.

Q. If the evaluation is different, then the same child could be diagnosed with gender dysphoria in one place and not in another; is that right?

A. I wouldn't expect that to be the case, no.

Q. But it's possible?

A. So I think that every child is a unique individual with oftentimes a complicated story to tell, that -- that the -- the criteria outlined by the DSM for gender dysphoria are pretty clear, and so I don't think that it's likely that a patient would be diagnosed with gender dysphoria by one individual with expertise in this field and not by another, but there are certainly cases where the diagnosis is complicated or unclear, and in those situations oftentimes time can be useful in the diagnostic journey, you know, if a patient is -- is maybe partially or borderline meeting criteria for gender dysphoria, then continuing to see where that patient's gender identity half progresses over time would be a helpful tool.

Q. But to go back to my question, it is possible that the

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same child would be -- could be diagnosed with gender dysphoria in one -- by one provider and not by another provider?
A. I don't think that's very likely. I think that it's hard to say that that would be impossible, but the -- the DSM pretty clearly outlines how to make this diagnosis so I wouldn't expect that to happen.
Q. You said that children in this country are generally treated in pediatric gender clinics. What is the basis of that statement?
A. As someone that works in the field, I -- I have knowledge of the options for pediatric patients and where they're able to receive the care that they need.
Q. Do you know what percentage of children with gender dysphoria who are undergoing medical transition are treated in pediatric gender clinics?
A. I don't know a percentage, but I expect it to be very high.
Q. You're not aware of a survey of children with gender dysphoria being medically transitioned as to in what context they're being treated?
A. If there's a survey, I don't recall it.
Q. And you're not aware of what percentage of children in Alabama are treated at a pediatric gender clinic there?

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A. No.
Q. Are you aware of any pediatric gender clinics in Alabama?
A. I don't -- I'm not intimately familiar with any pediatric gender clinics in Alabama, although I have an awareness that there is one in Birmingham.
Q. And you're not familiar with any others?
A. No.
Q. Do you know of any way of gathering data on children who are treated outside of pediatric gender clinics in terms of how many children are treated that way?
A. No.
Q. So to go back to this paper, in the second column in about the middle of that big paragraph you say, "Some items on the ASDS may be naturally observed in non-ASD gender dysphoric youth" --
A. My apology, I'm not following you yet. Where are we?
Q. Sure, sure. So the second column on 389, and we're in the one, two, three, fourth sentence. You say, "For example."
A. "For example," gotcha, yeah.
Q. "For example, some items on the ASDS may be naturally observed in non-ASD gender dysphoric youth, specifically an item on the cognitive subscale, "Appears to be aware that he or she is different from

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others," "and an item on the maladaptive subscale, "Does not change behavior to match the environment," "might capture expected observations in the gender dysphoria child.
"Thus, scrupulous attention to symptomology during ASD diagnostic evaluation of gender nonconforming youth is essential to minimize any risk of misclassifying gender dysphoric youth with high functioning ASD due to symptom overlap."
And then the next sentence, "Importantly, certain symptoms may be associated with both diagnoses, but stem from vastly different origins."
Do you still agree with that discussion?
A. Yes.
Q. And so would you agree that there's also risk of misclassifying high-functioning ASD youth as gender dysphoric?
A. Give me one second.
Q. Yeah.
A. It's a complicated paragraph, so let me just reread it.
So the paragraph that we read was talking about how patients with gender dysphoria may be over classified as ASD simply because of some of these examples on the ASDS.

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So your question is a reverse, correct? Could patients with gender dysphoria be misclassified and really have ASD?
Q. (Shakes head in the positive.)
A. I think that's harder for me to explain. So I'm not -- I'm not sure that that's what this paragraph would support.
Q. So why would the symptom overlap only lead to a risk of error in one direction?
A. Because these questions appear -- appears to be aware that he or she is different from others and does not change behavior to match environment. These are questions that are trying to diagnose autism spectrum disorder, but they're not questions that you would use to diagnose gender dysphoria.
Q. You don't think those questions could be relevant under the DSM-5?
A. Pertaining to the diagnosis of gender dysphoria?
Q. That's right.
A. Not without context including discussion of gender identity, no.
Q. I'm showing you what I'm marking as Exhibit 10, which was an article you coauthored, "Mental health of transgender youth in care at an adolescent urban community health center."

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Do you recognize this article?
A. Yes.
MARKED FOR IDENTIFICATION:
EXHIBIT 10
10:12 a.m.
BY MR. MILLS:
Q. If we could just go to page 8 of the article under "Conclusion" the first paragraph. This is the last two sentences of that first paragraph under "Conclusion."
"Patients with a transgender identity or history should be recognized as having higher risk for mental health concerns and should be carefully screened and evaluated. Patients identified with cooccurring transgender identity and mental health concerns should be seen by a mental health provider who is qualified to provide evidenced-based care with sensitivity to the diversity of gender identity and expression."
Why do you think this is important?
A. I think the first sentence is important to point out that the pediatric transgender population is vulnerable from a mental health standpoint and having extra mental health support in place when managing gender dysphoria is critical.

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I think the second sentence is important because if someone has gender dysphoria and you're treating that gender dysphoria, but they have unmet -- other unmet psychiatric needs, like depression or anxiety that are unrelated to their gender dysphoria, that by not managing those things, you're not maximizing that child's health and potential.
Q. Do you think this screening and evaluation should occur before any medical interventions?
A. I do think that assessment of a patient's overall mental health is important prior to proceeding with a medical intervention, yes.
Q. So if a patient is not seen by a qualified mental health provider before medical intervention, you would say that would be a substandard quality of care?
MS. WILLIAMS: Objection.
A. My -- if we think about the, you know, WPATH Standards of Care, the recommendation is to involve a multidisciplinary team when providing care to gender dysphoric youth, so there are certainly many ways to do that, and so the composition of that team could look different in different places, but having -- having some sort of evaluation of a child's mental health by a person that is competent in performing that evaluation is something that I believe to be important.

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BY MR. MILLS:
Q. And you would agree that the WPATH standards call for a comprehensive psychosocial assessment by a qualified mental health provider, right?
A. I'm not sure if those are the exact words, but something to that effect is something that I would support.
Q. So if that doesn't happen, you would say that the patient has not received the standard suggested by WPATH?
A. If they haven't received the care as outlined by WPATH Standards of Care, then they haven't received the standard of care as outlined by WPATH by definition.
Q. And would you say that would then be a substandard quality of care?
MS. WILLIAMS: Objection.
A. I don't know if there's a specific definition for substandard quality of care, but it wouldn't be the type of care that I would support or suggest.
BY MR. MILLS:
Q. In the context of medical gender transition, should the treating endocrinologist be aware of cooccurring psychiatric conditions the patient may have?
A. Sorry, can you repeat that once more?

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Q. Sure. So within medical gender transition for patients with gender dysphoria, should the treating endocrinologist be aware of cooccurring psychiatric conditions the patient may have?
A. Yes.
Q. And should the treating endocrinologist be aware of other issues that may affect gender dysphoric treatment such as a past history of sexual trauma?
A. That one's a little bit harder for me to answer. I think that it -- it -- if that history of sexual trauma was important in the narration of that child's gender identity, then -- then yes, but not -- I wouldn't suggest that all sexual trauma would impact one's gender identity, so it's -- so I'm not sure.
Q. In your experience, is it common for the sexual trauma to not affect gender identity?
A. Yes.
Q. Would you agree that the mental health provider working as part of an interdisciplinary team should still know about issues that may affect gender dysphoria treatment such as a past history of sexual trauma?
A. So we're in that question assuming that past history of sexual trauma does impact one's gender identity, so I -- I'm not sure that I can answer that question

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without first validating that statement.
Q. Do you think it would be significant in the diagnosis of gender dysphoria to know whether there is a past history of sexual trauma?
A. I think that that's an important component of any mental health evaluation if you're taking a complete biopsychosocial assessment, and then in talking through that sexual trauma if present, the professional can work -- work with the -- the patient or client on how their understanding of their gender identity was or was not impacted by that event.
Q. So if a comprehensive assessment happened, then someone on the interdisciplinary team should know about the history of sexual trauma even if it's not directly tied to gender dysphoria?
A. I think -- I'm not sure that I'm the right person to ask this question. I think that a mental health professional who takes -- does a biopsychosocial assessment, I'm not sure whether asking about sexual trauma is a component of all psychosocial assessments. I assume it is, but to be honest, I'm not 100 percent sure.
Q. Sure. Do you know the error rate of diagnosing gender dysphoria?
A. Well, I would say that -- that because there's

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specific criteria that -- that you use to diagnose gender dysphoria, the -- the clinician that's using those criteria wouldn't have the ability to have an error in making the diagnosis if using that criteria.
I think what you're asking is does that diagnosis of gender dysphoria and the subsequent treatment is that the correct treatment for that particular person. So I'm not sure I've explained that right, so let me -- let me try again.
You know, if a person is sitting in front of me, they either meet the criteria for gender dysphoria or they don't. So in that time and place there wouldn't be an error rate, but that's not the question that's relevant, right? The question is what do we do with that information.
Q. So you said wouldn't have the ability to make an error. Are you saying that someone applying the DSM-5 criteria could not make an error in diagnosing gender dysphoria?
A. I'm saying that if you're sitting with a patient and you're going through the criteria for gender dysphoria, it's you either meet each criteria or you don't, and then as a sum, you either do have the diagnosis of gender dysphoria or you don't in that interview that day and time.

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So, you know, if you're applying the DSM criteria, it's not the subjective. It would be either you do or you don't meet that clinical criteria. So that's why I'm having a hard time answering the question about an error rate.
Q. So on -- take a particular patient on that day, every mental health professional in the country would come to the same conclusion about whether that patient had gender dysphoria?
A. Well, if that's the goal of the DSM, right, because it's pretty clearly outlining how to make these diagnosis for mental health professionals that are using it.
Q. And you think that that is not just the goal, but the reality that 100 percent of the diagnoses of gender dysphoria are correct?
A. As I've explained it, right, you know, I think that, you know, if you're a mental health professional that's not asking the questions and just making assumptions, then I suppose you could be making an error, so perhaps not 100 percent.
But I -- I -- I would -- I would posit that, you know, when I'm -- when I'm thinking about your question clinically and I'm the endocrinologist seeing a patient, you know, the fact that they meet

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criteria for gender dysphoria is only one component of -- of the decisionmaking. That -- that much more important to me is the richness of that psychosocial assessment.
So -- so I think we're missing the boat if we're focused on meeting the -- you know, what the error rate of gender dysphoria is. Someone could have or not have gender dysphoria, but that -- what's more important to me as the clinician is understanding what their -- how their gender identity impacts their life and whether or not, you know, they require any medical intervention.
Q. Would you treat a patient who does not have gender dysphoria with medical gender transition?
A. They wouldn't require it because there's not distress associated with their gender identity difference.
Q. So it does matter to your treatment whether they have gender dysphoria?
A. Right. That would be the basic low bar that would qualify someone to consider treatment, but certainly not sufficient.
Q. By low bar, what do you mean?
A. If you don't have gender dysphoria, you don't require a medical intervention.
Q. Is it possible to misdiagnose gender dysphoria?

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A. I think that I tried to answer that question already.
Q. I'm going to mark as Exhibit 11 a deposition you gave in another case, Casey versus individual members of medical licensing board.
MARKED FOR IDENTIFICATION:
EXHIBIT 11
10:25 a.m.
BY MR. MILLS:
Q. If you could flip to page 41 -- and these are just excerpts because it was quite long. So this is the small page 41.
A. Oh, gotcha.
Q. Under line 15 to 16 you said, "I don't know what the error rate of diagnosis of gender dysphoria is."
Did I read that correctly?
A. You did.
Q. And is that what you said in this deposition?
A. Yes.
Q. And do you still agree with that statement?
A. So if we're talking about patients that are presenting to gender clinic and either meeting or not meeting the criteria for gender dysphoria, I would expect the error rate to be extremely small. And so do I know what the error rate is? No, but I would posit what I've said before, that meeting the diagnostic criteria

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for gender dysphoria is -- is objective, and -- and as a treating clinician on -- I'm interested to know that the -- whether or not the child meets those clinical criteria, but --
Q. So --
A. -- it's not a yes/no, treat if yes scenario. It's - if the patient doesn't have gender dysphoria, then they don't even need to see me.
Q. So just to go back to my question, would you say it is possible or not possible to misdiagnose gender dysphoria?
A. I think it's possible. You know, a patient may appear to meet the criteria, but -- or may -- I guess the answers a patient or client makes to the mental health professional may be misinterpreted, but I find that challenging to -- to expect to happen on an even remotely frequent basis.
Q. Would you expect that to be more frequent if the diagnosis is made by a nonmental health provider?
A. Not if that person is experienced in making the diagnosis of gender dysphoria.
Q. If they were not experienced in making the diagnosis, would you expect their rate to be higher?
A. I don't -- I don't know that the error rate would be high for anyone that's familiar with how to use the

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DSM, and if someone isn't familiar with using the DSM, then they probably wouldn't be making the diagnosis in the first place, so the question seems a bit abstract.
Q. You would say a person not familiar with the DSM should not be making the diagnosis of gender dysphoria, correct?
A. Correct.
Q. Do patients ever lie?
A. About anything?
Q. Mm-hmm.
A. Sure.
Q. Do adolescent patients ever lie?
A. Sure.
Q. Just a few more questions and then we can take a break, if that works for everyone.
So you are not a mental health professional; is that right?
A. That's correct.
Q. You're not a psychiatrist or a psychologist?
A. No.
Q. And you're not offering your opinion here as a mental health expert, correct?
A. Correct.
Q. You don't have a residency or fellowship in psychiatry?

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A. No.
Q. You don't have a degree in child and adolescent development and psychology?
A. No.
Q. Do you consider yourself trained and professionally competent in using the DSM-5 to make child and adolescent mental illness or psychiatric diagnoses generally beyond gender dysphoria?
MS. WILLIAMS: Objection.
A. As a general pediatrician, I'm comfortable making -- as a person that has gone through general pediatrics residency, I do feel comfortable making certain diagnoses like major depression -- major depressive disorder, generalized anxiety disorder, and then certainly other more complex psychiatric conditions I do not feel competent in making those diagnoses.
BY MR. MILLS:
Q. Sure. And you are not an epidemiologist, correct?
A. Correct.
Q. You don't claim to be an expert in statistical analysis; is that right?
A. I do have a master's of public health, and as part of that degree I was trained in epidemiology and statistics, but that's not my career.
Q. And when you coauthor papers involving statistical

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analysis, does another researcher typically perform that statistical analysis?
A. In -- for the most part, we -- I work with statisticians when I'm writing papers, although during fellowship one of the tasks is to do the statistics on your own, so I have participated in those -- those endeavors, but love having a good statistician on the team.
Q. So the articles that you've published that, you know, may be referenced in your report involving statistical analysis, you know, someone else did that analysis generally, is that fair to say, in terms of the number crunching, p-values?
A. I guess we could look at a particular article and I could recall.
Q. Sure. Have you ever conducted a systematic review of the literature on medical gender transition in minors?
A. No.
Q. Have you -- sorry, scratch that.
You're not a neuroscientist, correct?
A. Correct.
Q. You don't have any training in -- specialized training in brain studies; is that right?
A. Correct.
Q. You don't conduct brain studies?

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A. I don't.
Q. You don't interpret brain imaging in your practice?
A. I do.
Q. Have you ever used brain imaging to treat gender dysphoria in your clinic?
A. No.
Q. You haven't written any articles on neuroscience, have you?
A. No.
Q. Have you ever peer reviewed a neuroscience journal article?
A. Not to my memory.
Q. You're not a genetic researcher, correct?
A. Genetic researcher. No.
Q. You don't have any formal training in genetics research?
A. Not above and what is required in medical school and residency and fellowship for pediatric endocrinologists.
Q. Sure. You haven't published any articles on genetics?
A. No.
Q. You don't typically use genetics to treat gender dysphoria in your clinic?
A. No.
Q. You've never conducted a survey about the parameters

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of gender-affirming care provided by other practitioners, correct?
A. Correct.
Q. So you don't have any personal knowledge of how many other practitioners follow the WPATH Standards of Care 8, right?
A. I have personal knowledge as it relates to me knowing many of the providers across the country, interacting with them academically, so that in that respect I do have knowledge of how -- how other -- how gender care is provided across the country.
Q. But you wouldn't be able to venture a number with confidence as to how many other providers in the United States follow WPATH Standards of 8 -- Standards of Care 8 in treating minors with gender dysphoria?
A. I would posit that it's a very high percentage, but beyond that I don't have a number to offer.
Q. And you don't have a number to offer if -- on the same question looking at providers in Alabama; is that right?
A. Correct.
Q. And you also don't know what percentage of providers in the United States follow the Endocrine Society's guidelines to treating gender dysphoria in minors?
A. You know, similarly to all areas of medicine there's

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guidelines and standards of care, and as an endocrinologist I could be asked the same question about diabetes and I would have the same answer, that we have guidelines and recommendations set because these conditions are -- are common and treated by endocrinologists across the country and across the world.
So I would say that the vast majority of endocrinologists would treat patients with diabetes according to the American Diabetes Association diabetes standards or care, and couldn't offer a percentage of people that are practicing outside of those guidelines. In a similar way, I would have a similar answer to the treatment of gender dysphoria.
Q. So you have no knowledge of whether most minors with gender dysphoria are treated through a multidisciplinary care model, do you?
A. To the existent that I'm familiar with the options for youth across the country, I would say that that type of model is by far the most common model and the percentage would be very higher.
Q. You have no knowledge of whether most gender dysphoric minors in Alabama are treated through a multidisciplinary care model, correct?
A. I have no particular knowledge of them outside of my

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answer to the previous question.
Q. And you're only aware of a single multidisciplinary care model being provided in Alabama; is that right?
A. That's the clinic that I'm aware of. I'm not aware of others, but don't claim to know all of the gender clinics across the country.
Q. You have no knowledge of how many minors nationwide are prescribed medical gender transition interventions, do you?
A. A number, no.
Q. Your earliest publication or presentation on a topic related to transgender medicine was in 2013; is that right?
A. That sounds correct.
Q. And when did you begin treating minors with gender dysphoria?
A. I was involved with the gender clinic at Boston's Children Hospital as a fellow, so I was seeing patients under supervision and completed my training in 2015 at which point I began practicing independently.
Q. And have you -- do you have any knowledge of how the -- of what has happened subsequently with the patients you were treating at Boston Children's while you were a fellow?

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A. So I -- all -- certainly not all of the patients that I've been treating are enrolled in a longitudinal study and have interval follow-up in their twenties and thirties. So similarly to patients that I saw in fellowship for any other condition, I don't have a mechanism for longitudinal follow-up for all of those parents.
Q. So in 2015, if the oldest patient you saw that was a minor was age 18, that would mean the oldest minors who you helped treat with medical gender transition interventions would be around 27 now; is that right?
A. The math seems to check.
Q. So you aren't aware of any follow-up with your patients beyond the age of 27?
A. Correct.
Q. How did you come to be involved in this case?
A. I believe the legal representation for the -- the US reached out to me directly.
Q. How often does your clinic see patients for gender dysphoria? Well, sorry, minor patients for gender dysphoria?
A. So there's several physicians that work in the clinic and several mental health professionals, so every day someone is seeing patients. I see patients two half days a week.

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Q. So about how many patients would you see a month of minors considering medical gender transition?
A. Are you asking minors -- are you asking how many patients under 18 that I see are considering, or we're assessing for, or are being seen that are already on, or what is your more precise question?
Q. Sure, sure. That you see that are either considering or are already on medical gender transition interventions?
A. Oh, okay. So probably about 60. Per month you asked?
Q. Yes.
A. Yeah.
MR. MILLS: I think it's a good time for a break, if that's okay with everyone.
All right, we can go off the record.
(Recess taken at 10:40 a.m.)
(On the record at 10:48 a.m.)
BY MR. MILLS:
Q. Would you agree that puberty is a sexually dimorphic process?
A. Puberty means -- puberty is a stage in life where a child's body becomes an adult's body and typically that goes one of two directions according to the hormonal sex of the individual.
Of course there can be variability. You

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know, female body people with PCOS can have higher androgen levels. There can be other endocrine differences, but generally there's a masculinizing and a feminizing puberty as the -- if we're dichotomizing.
Q. So would you agree with this definition: Puberty is the process of physical maturation where an adult -- sorry, I'll start over.
Pubertal is the process of physical maturation where an adolescent reaches sexual maturity and becomes capable of reproduction?
A. I think that captures some of what I was talking about. And, you know, I would -- I would say that there's more elements to puberty than simply contained in that one sentence.
Q. Would you agree that developing reproductive capacity is a fundamental purpose of puberty?
A. It's something that occurs during puberty. I'm not sure that you can say that a stage has a purpose. That, you know, sort of to me implies that puberty is an entity itself that has a particular purpose in mind, but reproductive potential -- the development of reproductive potential is something that occurs during a stage in life that we're talking about which is puberty.
Q. Would you say it is the central aspect of puberty?

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A. I don't know how I would respond to that. I think there's lots of different elements of puberty, so to say that gaining reproductive potential is the central aspect, no, I'm not sure that I would agree with that.
Q. So evolutionarily do you think there are other purposes of puberty?
A. Sure.
Q. What would those be?
A. Increasing height and strength. Those are a couple examples.
Q. When does puberty typically begin?
A. On average between ages 10 and 12.
Q. And does it vary in males and females?
A. To some extent, yes.
Q. So female puberty could start as early as 8 to 9; is that typical?
A. It would be considered precocious puberty or abnormally early puberty if female puberty started prior to age 8. So 8 is a reasonable cutoff for what would be considered normal, and then can be also normal to not start puberty until 12.
Q. And what about for boys; what would be the cutoff for precocious puberty?
A. Generally the ages that pediatric endocrinologists think about would be 9. Starting male puberty younger

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than age 9 would be precocious, and absence of puberty by age 14 would be delayed.
Q. So a 10-year-old boy who was starting puberty -- sorry. Would you consider a 10-year-old boy starting puberty to have precocious puberty?
A. No.
Q. Physical changes associated with puberty often cause anxiety or distress regardless of gender identity; is that right?
A. I'm not sure how frequently that's true. Is there a source that I could refer to?
Q. I just was curious in your experience, you know, do you find that adolescents starting puberty are worried about their physical changes?
A. Some may be.
Q. Do you think that's -- in your experience is that common?
A. I don't hear other patients that I take care of expressing anxiety about puberty in my practice, but I'm sure that some patients are anxious about puberty.
Q. When thinking about the dividing line between children and adolescents, would you consider puberty to be the dividing line starting puberty?
A. I -- I think that I'm not sure that I hold significance to children versus adolescents in that

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particular way, but I think that's a reasonable way to think about it.
Q. Can puberty cause adolescents' view of their own gender identity to evolve?
A. Could you say that again, please?
Q. Yeah. Can puberty cause adolescents' view of their own gender identity to evolve?
A. The experience that I hear from adolescents is that, you know, their -- an adolescent may describe that they had a particular feeling, that they were uncertain what that feeling was, and then as puberty progressed and they started to tangibly see the development of secondary sex characteristics, they had a better understanding of that feeling as a difference in gender identity, so in that way, yes.
Q. Does sexual attraction usually emerge during puberty?
A. I don't -- I don't think that I know the answer to that question specifically. I think that -- that as a pediatric endocrinologist I hate to posit an expert response on that.
I think there are certainly children that are prepubertal that have attractionality, either same sex or opposite sex attraction, so the evolution of sexual orientation is something that I -- I hesitate to speak on further.

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Q. But would you agree generally that puberty can lead to an increase in feelings of sexual attraction?
A. I would agree with that.
Q. Can the emergence of sexual attraction or the development of sexual attraction -- I'll start over.
Can the development of sexual attraction during puberty cause adolescents' view of their own gender identity to evolve?
A. That's not something that I heard from patients that -- that explain their gender identity to me that they're talking about sexual orientation and attractionality as a different concept than their gender identity, so I don't think that I would agree with that statement.
Q. If you could go back to Exhibit 1. This was your Advances in Pediatrics article. I'm sorry, I know you have a stack in front of you.
A. Advances in Pediatrics.
Q. Mm-hmm. So this is on page 6 in the middle of the page. The second full paragraph is talking about children who will persist in their gender identity during adolescence and adulthood versus those who will desist.
On the one, two, three, fourth sentence you say, "Important factors in early adolescence included

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the social environment, feelings toward pubertal changes, and the emergence of sexual attraction."

So you would agree that in the study you're talking about here emergence of sexual attraction was considered an important factor in identifying persistent gender dysphoria?

A. Could you tell me what the start of that sentence was?

Q. Yeah. So you're talking about one of the Dutch studies here about persistent. So I question was, this study that you talked about in your report found that the emergence of sexual attraction was an important factor in earlier adolescence for the persistence of gender dysphoria, right?

A. Yeah, so I think what I'm saying here is that when you're a prepubertal child and you're having -- you're exploring concepts like gender and attractionality, those concepts can -- can be confusing and sometimes conflated, but that the emergence of -- as puberty begins and you have the development of secondary sex characteristics and you're thinking about attractionality and gender in more tangible ways, that the ability to disconflate, if that's a word, gender identity from attractionality becomes easier.

Q. So your report says that, "Persistence or intensification of gender dysphoria as puberty begins

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is used as a helpful diagnostic tool as it becomes more predictive of gender identity persistence into adolescence and adulthood."

Do you still agree with that statement?

A. Yes.

Q. And that's why you don't give puberty blockers before Tanner stage 2; is that right?

A. That's one reason, another being that you don't need to block something that doesn't exist.

Q. If you gave puberty blockers before Tanner stage 2, it would deprive you of what you described as a helpful diagnostic tool, correct?

A. Correct.

Q. If you gave puberty blockers before Tanner stage 2, it would block even the Tanner stage 2 development of secondary sex characteristics, correct?

A. It would.

Q. And so you allowed those secondary sex characteristics to begin development up to Tanner stage 2 before providing puberty blockers?

A. Correct.

Q. By the same token, persistence or intensification of gender dysphoria as puberty progresses could be a helpful diagnostic tool; is that right?

A. Yes.

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Q. Would you agree that a 19-year-old will have a better sense of their gender identity than an 11-year-old?

A. No. I think everyone has an equal sense of their gender identity at that time. The question is how predictive is that gender identity of their future gender identity.

Q. And so would you agree that a 19-year-old will have -- will be able to provide a better prediction of their future gender identity than an 11-year-old?

A. If that 11-year-old has started to develop secondary sex characteristics and is having distress associated with them, then I would think that that 11-year-old's assessment of their gender identity would be quite predictive of their future gender identity similarly to a 19-year-old.

Q. Would you still say that the 19-year-old's assessment would be more accurate?

A. Accurate of what?

Q. Their future gender identity.

A. I would. That's why we use pubertal suppression to buy additional time and processing and understanding; that's why we don't treat 11-year-olds with gender-affirming hormones.

Q. So would you say a diagnosis of gender dysphoria -- sorry, scratch that.

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Would you also agree then that a 19-year-old will have a better sense of their future gender identity than a nine-year-old who is before Tanner stage 2?

A. Again, you're asking if their -- because everyone's gender identity at that time is a -- is -- you're asking is a 19-year-old's gender identity currently more predictive of their gender identity when they're, say, 29 compared to a nine-year-old's?

Q. That's right.

A. I would agree.

Q. And just to confirm, you said in your clinic you don't treat with cross-sex hormones at age 11; is that right?

A. I don't.

Q. And is that true even if someone started puberty blockers, a girl, say, started puberty blockers at Tanner stage 2 at age 9?

A. I have a hard time stating that I would have a hard and fast age cutoff for something that I consider more of a developmental decisionmaking process with patients and families, but it's not my practice. I haven't had patients at age 11 that I have felt comfortable starting gender-affirming hormones.

Q. So to go back to the line of questions we were just

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talking about in terms of future gender identity, you would agree that an 11-year-old -- sorry, scratch that. We can move on from that.

I have an article that I'm marking as Exhibit 11, which is entitled "Criminalization of gender-affirming care interfering with central treatment for transgender children." Oh, sorry, this is 12. I'm just going to change that number.

A. Oh, yeah.

Q. I lost track here.

MARKED FOR IDENTIFICATION:
EXHIBIT 12
11:05 a.m.

BY MR. MILLS:

Q. This is Exhibit 12, "Criminalization of gender-affirming care." This is an article you coauthored; is that right?

A. Yes.

Q. And it was published in the New England Journal of Medicine; is that right?

A. Yes.

Q. Okay. If you could go to page -- the first page of -- 579 is the first page. The start of the last paragraph here in the third column you say, "Gender dysphoria can be treated with both nonmedical and

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medical intervention."

Do you still agree with that?

A. Yes.

Q. So sometimes medical interventions for gender dysphoria are not warranted?

A. Correct.

Q. And sometimes nonmedical interventions would satisfactorily resolve any gender dysphoria?

A. It's possible.

Q. If you could flip back to Exhibit 4, which is your article "Serving Transgender Youth." And I'm on page 5 in the middle of the page, kind of right in the middle of the long paragraph on the page, the sentence that starts with, "Further," looks like the fourth sentence, "Further, we have found psychotherapy exceedingly helpful for treating cooccurring mental health issues and for exploring the child and/or adolescent's thought processes, family functioning strength and support systems."

Do you still agree with that statement I just read?

A. Yes.

Q. So psychotherapy can be exceedingly helpful for treating cooccurring mental health issues?

A. Certainly.

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Q. And treating those issues can be necessary for a child's health; is that right?

A. Yes.

Q. So continuing on it says, "In addition, psychotherapy enables a deeper exploration of the child's gender dysphoria, the range of gender expression and gender identity questioning, and whether the subjective experience fits more into a model of binary identity, e.g. male/female versus a fluidity of gender and gender nonconformity."

Do you still agree with that statement?

A. Yes.

Q. Page 7 the start of the second paragraph, really the first full paragraph, the paragraph right above "medical intervention," the first sentence, "Continuing psychotherapy for youth is typically recommended by our protocol."

Is that still true in your clinic?

A. I think that every adolescent could benefit from therapy, especially adolescents that are in -- undergoing gender transition.

A patient that is not experiencing any mental health problems at all may not require therapy and wouldn't be required to be in therapy to continue treatment, but I as a -- as a pediatrician, I find

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that therapy is of value for most adolescents.

Q. But patients with gender dysphoria are experiencing mental health -- a mental health issue, correct?

A. Gender dysphoria is a mental health condition outlined in the DSM with the treatment being the medical interventions that we -- that we have been reviewing.

So if a patient has -- is being treated for gender dysphoria and has -- has no other mental health problems, while therapy wouldn't be required, I think that it's always helpful to have someone in your corner that you can bounce things off of because adolescence is an unpredictable and challenging time for everybody.

Q. So just to go back to the sentence, "Continuing psychotherapy with youth with gender dysphoria is typically recommended by our protocol," is that still true in your clinic?

A. Yes.

Q. And would you consider that continuing psychotherapy part of the standard of care?

A. Well, I don't know that the standard of care outlines that every person that's receiving gender-affirming hormonal care requires psychotherapy, but the fact that it's typically recommended by me and by our clinic is true.

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Q. And sometimes do you treat patients, minor patients with gender dysphoria with psychotherapy alone?
A. If that helps to address their gender dysphoria or if they otherwise are unable to receive hormonal interventions.
Q. And some minor patients see their gender dysphoria resolved with psychotherapy and without additional medical interventions?
A. So I think that generally a patient that is receiving psychotherapy as treatment for their gender dysphoria is exploring in that psychotherapy how they can express their gender identity in a way that alleviates their gender dysphoria, so that psychotherapy could involve figuring out safe ways to make a social transition or whether social transition is safe for that patient, you know, exploring things like that.
So it's -- it's not that the psychotherapy is being used to say, you know, despite the fact that you have this difference in gender identity, you know, you're going to, you know, learn to forget about that gender identity and accept the sex that you were assigned at birth. It's more, you know, what nonmedical approaches can we use to -- to help you cope with this disconnect that you have between your body and your gender identity.

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Q. And sometimes the psychotherapy plus nonmedical approaches are sufficient to resolve the gender dysphoria; is that right?
A. It could be.
Q. And this psychotherapy that you're describing would not be conversion therapy; is that right?
A. Correct.
Q. If you could look at Exhibit No. 1, this is back to your Advances in Pediatrics article. This on page -- let's see here what page are we on. This is on page 4, the paragraph just before the "Development of Gender Identity" heading, this is the second sentence.
"Prior to the late 1990s, treatment of children or adolescents with gender dysphoria was not considered."
Do you still agree with that statement?
A. In the ways that we're describing today with hormonal interventions, that's correct.
Q. Right. So this is referring basically to puberty blockers or cross-sex hormones?
A. Correct.
Q. To go back a page to page 3, the first sentence under "Historical Perspectives: Prior" -- sorry, I'll wait for you.
This is the first sentence under

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"Historical Perspectives: Prior to the isolation of sex hormones their development into an injectable or oral compound to be administered in development of surgical techniques, there was no options -- there were no options to change one's secondary sex characteristics."
Do you still agree with that statement?
A. Yes.
Q. And then flipping to page 9 of the same article, in the middle, this is the third sentence under "Overview of Medical Management."
"Primary goals of sexual interventions include 1) prevention of" --
A. "Of medical."
Q. Oh, sorry. "Primary goals of medical interventions include 1) prevention of the development of unwanted secondary sex characteristics of the biologic sex; and 2) promotion of the development of desired secondary sex characteristics of the affirmed gender."
So the purpose of puberty blockers is what you said in number 1 there, prevent the development of unwanted sex characteristics of the biologic sex, right?
A. That would be one of the goals of pubertal blockade.
Q. And the purpose of cross-sex hormone therapy is to

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change the appearance of one's secondary sex characteristics?
A. Ultimately the purpose of both of these medications is to treat gender dysphoria and improve quality of life, but more proximally, yes, the gender-affirming hormones would promote the development of the desired secondary sex characteristics.
Q. And so these two purposes which, as you said, both go to the ultimate treating gender dysphoria, these purposes are the same regardless of the patient's biologic sex, right?
A. Correct.
Q. And these treatments do not change the chromosomal sex; is that right?
A. That's correct.
Q. They don't change the genetic sex?
A. I would think of that as the same as chromosomal sex.
Q. Okay. And they do not change the gonadal sex, correct?
A. Correct.
Q. If we could flip back to Exhibit 8, which was the chapter in the book, and we are going to the bottom of page 171. In looking at Figure 9.1 here, so this figure shows when you would typically start medical interventions to treat gender dysphoria, right?

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A. Yes.
Q. Okay. And we talked a little bit about this, but it shows puberty blockers being started around age 10 or at Tanner stage 2, right?
A. Right. It says Tanner stage 2 with this karat type symbol implying that that could be a variety of different ages --
Q. Sure.
A. -- centered around -- around 10, 10 and a half, 11.
Q. Right, yeah, and we discussed that earlier. So let's see. Sorry.
And that use of puberty blockers around age 10 or at Tanner stage 2 is consistent with WPATH and Endocrine Society guidelines?
A. Yes.
Q. You wouldn't consider a 10-year-old to be an older adolescent, would you?
A. No.
Q. So it would not be correct to say that under the existing guidelines medical interventions for gender dysphoria are reserved for older adolescents, correct?
A. No. I would -- I would -- I would use hormonal interventions such as testosterone, estrogen in place of medical to make that sentence accurate.
Q. Okay. Because puberty blockers are not reserved for

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older adolescents?
A. Correct.
Q. If you'd turn to 169 of this same document at the very top of the page, "The current hormonal management of transgender youth involved from strategies first described by Delemarre van de Waal and Cohen-Kettenis at the Amsterdam gender clinic in 2006."
Do you agree with that statement, other than my butchering of the Dutch names?
A. Yes.
Q. And did the use of puberty blockers to treat precocious puberty originate before 2006?
A. Yes.
Q. Does the standard course of treatment for precocious puberty present significant risks to fertility?
MS. WILLIAMS: Objection.
A. No.
BY MR. MILLS:
Q. So if you go back to 172 of this document at the top, the second sentence, "The goals of supervision include i. Prevention of development of unwanted secondary sex characteristics, ii, mitigation of the accompanying dysphoria associated with puberty; and iii, The ability to delay decisions around gender-affirming hormone treatment."

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This refers to puberty blockers, right?
A. Yes.
Q. And when you use puberty blockers to treat precocious puberty, you are trying to prevent the premature development of secondary sex characteristics, right?
A. Yes.
Q. You are not trying to prevent the development of sex characteristics entirely, correct?
A. Eventually that person will develop secondary sex characteristics upon discontinuation of the GnRH agonists, so you're delaying the development of those secondary sex characteristics. You're allowing for full height potential and other goals of care when you're treating precocious puberty.
Q. Right, but a goal is not to prevent the development of sex characteristics entirely forever?
A. Correct.
Q. And when you -- when you use puberty blockers to treat precocious puberty, you are not trying to mitigate gender dysphoria?
A. Correct.
Q. And you're not trying to delay decisions around gender-affirming hormone treatment when you're using them in the context of precocious puberty?
A. That's correct.

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Q. So these goals of using puberty blockers to treat gender dysphoria are different from the goals of using puberty blockers to treat precocious puberty, right?
A. Correct.
Q. If you could look at the bottom of page 172. This is at the end of the paragraph that's almost at the bottom. "The majority of patients presenting to care may not present at Tanner -- sorry, I'll start over.
MS. WILLIAMS: I'm sorry, where -- just a minute. Where are you exactly?
MR. MILLS: This is the last full paragraph on 172, the end of the paragraph, the last two sentences.
MS. WILLIAMS: Great.
BY MR. MILLS:
Q. "The majority of patients presenting to care may not present at Tanner stage 2. In our clinical practice, about two-thirds of adolescent patients present to care at a more advanced pubertal stage. In these cases, the decision regarding whether to consider GnRH agonist treatment is more complex."
So you're saying for most patients in your clinic when you're thinking about using puberty blockers, puberty has already progressed past Tanner stage 2, right?

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A. Well, it's a little complicated because the majority of patients that are presenting postpubertal, you know, we are not considering GnRH agonists, and I would say that even for patients that present mid-puberty, GnRH agonists may or may not meet our treatment goals.

So, for example, a transgender young man who is midway through puberty and has started the menstrual cycle, you could theoretically give that patient GnRH agonists and stop the menstrual cycle and prevent progression of breast development, but you could just as easily use other medications to stop the menstrual cycle. The breast development has already happened, so the advantage of using GnRH agonists in that situation wouldn't be very high. A transgender girl who is partially into puberty, if she hasn't developed masculine facial features, then perhaps GnRH agonists would be more helpful.

In both of those situations, you know, I'm explaining an example that we wouldn't be yet considering hormones, but whether or not the GnRH agonists would be helpful or not really depends on the clinical scenario and may or may not be helpful later in puberty.

Q. Sure. So go to the bottom of the page here.

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"The following factors should be considered when discussing GnRH agonist use for the transgender adolescent presenting at a pubertal stage more advanced than Tanner stage 2." And then there's a couple things, and flip over to page number 4, "Is the patient male or female."

So when you're thinking about whether to use puberty blockers in those post-Tanner stage 2 patients, that discussion might vary based on the patient's sex, right, biological sex?

A. Yeah. For the example --

Q. Right.

A. -- that I just demonstrated to you.

Q. Right. Because the -- and that's just to try and explain what you said, and that's because the -- the secondary sex characteristics of males and females differ in their development?

A. Correct. A mid-pubertal trans boy may be most concerned about their menstrual cycle. Breast development progressing slightly might not be as big of a concern. Whereas, trans girl would be -- could be most concerned about facial masculinization, and GnRH agonists would be a useful tool to stop further facial masculinization, but there are simpler ways to treat the menstrual dysphoria.

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Q. Sure. So just to go back to what we read a minute ago, the majority of patients presenting to you for gender dysphoria are past Tanner stage 2; is that right?

A. Correct.

Q. And is that different from the patients you treat for precocious puberty?

A. That's hard to say. I think that patients with precocious puberty are also a variable group. Some patients are presenting for -- to medical attention at the very first sign of pubertal changes, where others are late to be picked up and may be further progressed into puberty before presenting to care.

Q. But would you say that most of the patients you see for precocious puberty are still at Tanner stage 2?

A. I'm not sure I could say that.

Q. The risk of delaying a normally timed growth spurt is present when using puberty blockers for gender dysphoria; is that right?

A. Say that one more time, please.

Q. The risk of delaying the normally timed growth spurt is present when using puberty blockers for gender dysphoria?

MS. WILLIAMS: Objection.

A. So when you're using pubertal suppression for gender

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dysphoria, you're delaying the pubertal growth spurt, yes.

BY MR. MILLS:

Q. When you use puberty blockers to treat precocious puberty, is the goal that the growth spurt will occur at the same time as it would have in a patient without precocious puberty?

A. Yes.

Q. You would agree that puberty blockers are not approved by the FDA to treat youth with gender dysphoria?

A. Right, gender dysphoria is not an indication for use.

Q. And that's because the FDA has not received satisfactory data demonstrating safety and efficacy?

A. I do believe that would be what would be required to obtain that indication.

Q. So if we go back to the book chapter we've been looking at page 174, and again this is Exhibit 8, this is the third sentence on 174 at the very top, "Unlike estrogen monotherapy, testosterone monotherapy is more effective at suppressing further development of female secondary sex characteristics, and the additional benefit of concurrent use of GnRH agonists is likely minimal."

Is that one reason why it matters whether the patient is a male or a female?

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A. Well, yes. If you're -- if you're -- we're talking about two different -- two different types of patients when we're talking about trans young men and trans young women.

When you're treating with testosterone, testosterone by itself typically serves the purpose of raising the testosterone level up into the normal male range and suppressing the estrogen level into the normal male range. Whereas, estrogen by itself for a trans woman typically can raise the estrogen level up into the normal female range, but by itself oftentimes does not lower the testosterone level into the normal female range.

Q. So this is going to sound like a dumb question, but so your use of the cross-sex hormone testosterone or estrogen would depend on the individual's biological sex?

A. Yes.

Q. If we go back to Exhibit 1, which was the Advances in Pediatrics article and go to page 24, which is the last page, there's a table.

MS. WILLIAMS: Just a second.

MR. MILLS: Sure. Yeah, the back cover.

BY MR. MILLS:

Q. Table 2 is entitled "Medications used in the treatment

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of transgender adolescents."

So this is -- these are treatments for gender dysphoria that you're listing here, correct?

A. Yes.

Q. And this table is not listing treatments for other conditions, correct?

A. Well, these medications can be used for other conditions, but this is a table specifically talking about the treatment of gender dysphoria.

Q. Sure. So the second -- the second half of the table says, "Promotion of the development of desired secondary sex characteristics."

So the point of the cross-sex hormone therapy is to develop secondary sex characteristics that would not otherwise be present based on the biological sex; is that right?

A. Yes.

Q. All right. You list two medications for use here, and we've been talking about them already.

You agree you would use testosterone in biological females for treatment of gender dysphoria, right?

A. Yes.

Q. And according to Table 2, the mechanism of that treatment is activation of androgen receptors, right?

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A. Yes.

Q. Does testosterone have antidepressant effects in biological males?

A. I would say potentially there's -- there's men with low testosterone can have low energy and lower mood, so treating low testosterone can improve mood. I wouldn't say that -- I wouldn't think of testosterone as a treatment for depression, but depression that's concurrent with low testosterone in a cisgender man could improve with treatment.

Q. Would testosterone have the same mood-elevating effects in biological females?

A. It's possible.

Q. So the other treatment here is -- I'm really going to butcher this -- estradiol?

A. Yeah. Estradiol is just a medical term for estrogen.

Q. Okay. So according to the table, the mechanism of that treatment is activation of estrogen receptors, right?

A. Yes.

Q. And so you would agree you would use this medication estrogen in biological males for treatment of gender dysphoria, right?

A. Yes.

Q. In using estrogen or testosterone to treat gender

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dysphoria is also an off-label use, correct?

A. Correct.

Q. And that means that the FDA has never approved it for that indication?

A. That's correct.

Q. And that means that the FDA has not reviewed satisfactory clinical trial data establishing the safety and efficacy of these interventions for that indication?

A. Yes, that means that would be necessary to gain that indication.

Q. These hormone therapies, estrogen and testosterone, must be continued indefinitely into adulthood as long as the person wishes to continue medical gender transition; is that right?

A. Yes.

Q. Do you advise your patients that are going through the process of hormone therapy that this will be a treatment that they will have to undertake for a long period of time?

A. No, that's not how I frame it. I -- I talk to patients about the fact that every time we get together we're going to be talking about whether continuing the medical intervention is something that still feels like the right approach.

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Q. So you don't tell them that the therapies would have to be continued indefinitely as long as they wish to continue gender transition?
A. Yes, I both tell them that they would continue the medication so long as they would like to promote the development and maintenance of those secondary sex characteristics, but also that at every visit we would be reevaluating their goals and need for treatment.
Q. You wouldn't use testosterone for treatment of gender dysphoria in biological males, correct?
A. No.
Q. Because that would not treat a biological male with gender dysphoria, right?
A. Correct.
Q. Would it be in your view malpractice to prescribe testosterone to a biological male for treatment of gender dysphoria?
MS. WILLIAMS: Objection.
A. I can think of scenarios that you might prescribe testosterone to a biological male with gender dysphoria, but it wouldn't be treating their gender dysphoria.
So, for example, a biological male who is having suppression of testosterone and subsequent erectile dysfunction may be treated with a small

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amount of testosterone to treat the erectile dysfunction, but that would be treating the erectile dysfunction and not the gender dysphoria.
BY MR. MILLS:
Q. And by the same token, you would not use estrogen in biological females for treatment of gender dysphoria, correct?
A. Correct.
Q. So let's assume a patient with appropriately diagnosed gender dysphoria came into your office and was ready to start sex hormone therapy. What other information would you need to know to decide what to prescribe?
A. I would need -- sorry, could you say that one more time?
Q. Sure, I'll rephrase the question.
So again, take a patient with appropriately diagnosed gender dysphoria; they came in your office, they were ready to start on sex hormones. Would you need to know their biological sex to know what to prescribe?
A. I would need to know their anatomical hormonal sex. If that's the term we're using for biological sex, then yes.
Q. Okay. And do you test existing levels of estrogen or testosterone before starting treatment with cross-sex

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hormones for gender dysphoria?
A. I do like to maintain baseline hormone levels before starting treatment.
Q. Okay. And why is that?
A. To compare to follow-up labs.
Q. And is that routine in your practice?
A. Yes.
Q. If we could keep looking at this same article, go to page 12 in the middle, the second full paragraph.
A. Oh, which --
Q. Oh, sorry. This -- that's right, the Advances article, and instead of 17 B estradiol, I'm just going to say estrogen if that's okay?
A. Yes.
Q. So MTF, which I understand is male-to-female individuals are treated with estrogen to induce female secondary sex characteristics. And then skipping a sentence, "These changes are more effective when testosterone production is reduced either by using GnRH agonist medication or a progestin concurrently. Higher doses of estrogen would be required to produce feminizing changes if the testosterone concentration is in the normal male range."
So your discussion here refers to a biological male whose sex hormones are in the normal

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male range, right?
A. A male body person who is transitioning with estrogen, yes, this is what I'm describing, the options for treatment to -- to result in female level of estrogen and a female level of testosterone.
Q. And the reason higher doses of estrogen would be needed if testosterone is in the normal male range would be the testosterone has to be suppressed below the normal male range for estrogen to be effective?
A. Correct.
Q. And that estrogen level would be above the normal biological male range; is that right?
A. The concern here is that if you're using estrogen by itself as monotherapy, then you would need higher than ideal amounts of estrogen to achieve that goal, so that's why we combine estrogen with other antiandrogen medications.
Q. Right. But even in combination, the estrogen level of this male-to-female individual would be significantly above the estrogen level expected in a biological male, right?
A. Yes.
Q. We have no way of knowing what estrogen or testosterone level a specific transgender girl would have arrived at if she had been born female, correct?

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A. We know what the normal range is for -- for female body people, and so we use that range as a target and also clinical information such as feminization progress. But if you're asking counterfactual if this person was born assigned female at birth what would their estrogen level be, the estrogen level would vary throughout the day, but, no, I don't have a way to know exactly what the estrogen level would be in that counterfactual.
Q. If a biological female with gender dysphoria needs hormone therapy, it doesn't matter what gender identity the patient identifies as, correct?
A. Sorry, one more time.
Q. Yeah. If a biological female with gender dysphoria needs hormone therapy to treat the gender dysphoria, it doesn't matter what gender identity the patient identifies as, correct?
MS. WILLIAMS: Objection.
A. I think it does, it does matter. If that person identifies as female, I would have a hard time understanding why they would have gender dysphoria, so that would be something that I would need to explore, that wouldn't make sense to me, so it would matter what their gender identity is.
BY MR. MILLS:

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Q. If they said -- if the biological female said she was nonbinary, you would still be willing to treat the gender dysphoria with hormone therapy?
A. I would need to better understand what that meant to that patient and how that identity resulted in gender dysphoria, and also whether masculinization would be helpful to treat that gender dysphoria in that scenario because certainly some patients, like the one you're describing, would benefit from testosterone and others would not.
Q. When you decide not to give estrogen to a biological female for treatment of gender dysphoria and to give testosterone instead, are you discriminating against that person based on their sex?
MS. WILLIAMS: Objection.
A. I don't think I understand your question.
BY MR. MILLS:
Q. So earlier you said you wouldn't give estrogen to a biological female for treatment of gender dysphoria because you would give testosterone.
When you decide to use testosterone instead of estrogen based on the person's I think you said anatomical sex, would you consider that discrimination against that person based on their sex?
MS. WILLIAMS: Objection.

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A. No, I would -- I would call it appropriate medical management of gender dysphoria.
BY MR. MILLS:
Q. Has anyone ever accused you of discriminating based on sex for making those treatment decisions?
A. No.
Q. Have you ever been investigated by the federal government for discriminating on the basis of sex?
A. No.
Q. Would you consider yourself to have violated any law prohibiting discrimination on the basis of sex on that basis?
MS. WILLIAMS: Objection.
A. No.
BY MR. MILLS:
Q. If we have a biological female who was put on puberty blockers at Tanner stage 2 and then given testosterone as a treatment for gender dysphoria, the testosterone will not cause the female to develop reproductive capacity, correct?
A. I'm not sure that I agree with that statement completely. The patient that you're describing that's on GnRH agonists and then testosterone in the clinical scenario where now that patient is 18 and desiring fertility capacity, my advice would be to discontinue

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the testosterone and allow for endogenous puberty to occur.
Q. Sure. I'll ask it a little different way, I don't think I was clear.
So in the biological male puberty context testosterone leads to the development of reproductive capacity through spermiogenesis, right?
A. I think that's a little oversimplified, but as an endocrinologist I would say it's the LH and FSH hormones from the pituitary that is stimulating the testicles to produce testosterone and sperm cells. The testosterone is also required for the maintenance of that sperm-making organ to function properly, so in a longwinded way, I guess I'm agreeing with you.
Q. Okay. But in the biological female who was put on blockers at Tanner stage 2 and then given testosterone, that person is not going to develop sperm?
A. At the current time that person -- sorry, this is a --
Q. Biological female.
A. -- biological female on blockers and then on GnRH agonists and then starting on testosterone?
Q. Right.
A. So I would not expect that -- that person to be making follicles and ovulating. I suppose it's possible, but

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I would not expect it during treatment.
Q. And that person would also not be producing sperm?
A. Correct.
Q. Okay. Again, I'm sorry, I know that's kind of -- it seems like a silly question.
And then -- and then the same consideration, a biological male put on agonists at Tanner stage 2 and then given estrogen, that treatment -- the estrogen would not cause the male to develop female reproductive capacity in the sense of producing eggs?
A. Correct.
Q. And those doses of estrogen would also, as long as they're administered, preclude the male from developing male reproductive capacity; is that right?
A. I would expect it to be less likely that that person would have spermatogenesis while -- while not -- while on the treatment as you outlined.
Q. So relative to going through puberty without these interventions, this biological male would be less likely to develop reproductive capacity?
A. Yes. During the treatment course that you're outlining, that's correct.
Q. Have you ever prescribed testosterone to a biological male who wished to get stronger for bodybuilding?

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A. I may have prescribed testosterone to someone with low testosterone who also wanted to be stronger, but not someone with the normal male testosterone level who simply wanted to be stronger.
Q. Would you be willing to prescribe testosterone to a male who simply wanted to be stronger for bodybuilding?
A. No.
Q. Why not?
A. Because it's not recommended by any endocrine authority or medical body.
Q. So you wouldn't consider that treatment to be safe and effective; is that right?
A. It would probably be effective. I would have concerns about putting someone's testosterone level at a higher than normal level for a male. That would not be -- I would not consider that safe.
Q. And you believe you can opine on that safety even though you don't use this treatment for that indication?
A. In order to achieve the goals that you're describing, I think that you're implying that the testosterone level would be supratherapeutic or the testosterone level in this person would be higher than normal for a typical male, and in that situation based on my

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knowledge of -- of how testosterone works in the body, I would expect that person to be at higher risk for other problems such as polycythemia and hypertension, for example.
Q. And you can come to that conclusion even though you have not prescribed it before to someone who simply wanted to get stronger?
A. Correct.
Q. Have you ever prescribed estrogen to arrest growth in a biological female without gender identity issues who presented with complaints of tall stature?
A. I don't believe so. This was something that was more common several decades ago when -- when tall stature was a more common complaint for women, and the use of estrogen for tall stature in otherwise healthy woman is no longer recommended.
There are some tall stature conditions that you might consider using estrogen to close growth plates, some genetic tall stature disorders where it could be useful. I'm not sure that I've ever seen a patient that met those criteria, but if I did, then I would be comfortable doing that.
Q. Sorry, you would be or wouldn't be?
A. I would be if a female patient had a tall stature disorder and was going to be exceedingly tall and that

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would be interfering with her health, then estrogen could be considered as a treatment modality to arrest the growth plates.
Q. Have you conducted any clinical trials related to gender dysphoria?
A. No.
Q. I'm handing you an article you cited in I think your rebuttal report I'm marking as Exhibit 13, "Transgenderism and Reproduction."
Do you recognize this article?
MARKED FOR IDENTIFICATION:
EXHIBIT 13
11:51 a.m.
A. I believe so.
BY MR. MILLS:
Q. If you could turn to page 576, which is the second page, that key points box in the top left, the third point in that box it says, "Reproductive options for all trans persons are not equal because not only the gametes are of importance, but also the sex of the future partner."
Do you agree that statement?
A. I think it's a little bit of an odd statement, to be honest. I think what it's saying is that, you know, fertility may or may not be valued the same for every

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person, and they're implying that your attractionality may make your -- may make your valuation of fertility different, and while that may be true, I'm not sure that that would be universally true, so I think it's a tricky sentence to know whether I would agree or disagree; it's a complicated one.

Q. So specifically the part they say "the gametes are of importance," so would you agree that the treatments for gender dysphoria may have different effects on fertility depending on the person's biological sex?

A. Yes.

Q. On page 577, the next page, the first full paragraph at the top of the first column it says, "In trans women, feminizing hormonal therapy will lead to hypospermatogenesis and eventually azoospermia. The azoospermia will become irreversible after some time."

Azoospermia means the person has no sperm; is that right?

A. Mm-hmm. Yes, that's correct.

Q. And do you agree with this sentence that feminizing hormone therapy will lead to irreversible azoospermia after some time?

A. Sorry, which one are you asking if I agree with?

Q. Basically the second sentence, the azoospermia from the feminizing hormonal therapy, you know, do you

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agree that feminizing hormonal therapy will lead to azoospermia after some time?

A. I think that that is an over generalized -- over generalized statement. That I'm not aware of any research to suggest that all trans women will develop azoospermia after -- after being on estrogen for a certain period of time.

Q. So do you think these authors are incorrect?

A. I don't agree with that -- that sentence. I'm not seeing their citation for that -- that sentence, but if they're -- if it's 30 or 31, I would have to review that later in the paragraph, but I'm not aware of data suggest that all trans women are -- will become azoospermic after a period of time.

Q. Do you agree that some women will -- do you agree that some transgender women on feminizing hormonal therapy will become azoospermic after some time?

A. Yes.

Q. How long do you think this would take to occur?

A. I think it's extremely variable. I've had patients that have participated in a pregnancy unintentionally while treating with estrogen, and other patients that have had questions about their fertility and had -- and I've advised them that a course being estrogen should not be considered contraception because you may

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have the ability to make sperm on treatment.

So I think everyone's fertility potential is different at baseline, and then however long you're treated with hormonal interventions and how those interventions impact each person is different.

So I think for some people there would be no difference in fertility, and for other people there would be significant decrease in fertility if treated with estrogen for a prolonged period of time.

Q. Do you tell patients that they may suffer irreversible azoospermia?

A. I don't use that word because I don't think they know what it means, but I talk to patients about their risk of infertility when starting estrogen.

Q. And are you -- are you aware of any -- sorry, give me one second.

Are you aware of any biological male who started puberty blockers for gender dysphoria at Tanner stage 2 and then progressed to estrogen hormonal therapy and while continuing to use estrogen therapy was able to contribute sperm to a successful pregnancy?

A. The way you phrased that implies to me that the person was attempting to achieve a pregnancy while treated with estrogen, and I don't think that -- that that's

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the right way to think about it because a person wanting to achieve pregnancy would come off of their hormone treatment and wouldn't expect to be successful at achieving a pregnancy while on those interventions.

So the short answer to your question is no, but the scenario is impractical. The patient that is, say, has been treated with those interventions and would like to achieve pregnancy using their own gametes would discontinue treatment before attempting.

Q. And are you aware of any biological male treated for gender dysphoria with puberty blockers starting at Tanner stage 2 who then progressed to estrogen for at least five years who was able to successfully reproduce?

A. So again, I would say that I have -- I haven't -- I don't have awareness of a person that was treated at Tanner stage 2 and then started estrogen and has participated in producing a pregnancy, but I also haven't heard of anyone attempting to achieve fertility while being treated with those interventions, and so I think that's why I'm struggling to answer your question.

Q. So my question is really a biological male being treated for gender dysphoria with puberty blockers at Tanner stage 2 then five years of estrogen and then

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halts the treatment.
Are you aware of any such individual who was able to successfully reproduce after stopping the estrogen?
A. I'm neither aware of any such individual, nor am I aware of such individuals who have tried and failed.
Q. What about puberty blockers for a biological male at Tanner stage 2 followed by two years of estrogen; are you aware of any biological male who then stopped the estrogen and was able to successfully reproduce?
A. I'm not personally aware, but would find that to be quite plausible.
Q. But you don't know of any?
A. No.
Q. I'm going to show you as Exhibit 14 an article entitled "Consensus statement on the use of" -- we'll just shorten it to "GnRH hormone analogs in children."
MARKED FOR IDENTIFICATION:
EXHIBIT 14
12:00 p.m.
BY MR. MILLS:
Q. This is a consensus statement published it looks like in the AAP Journal of Pediatrics.
Are you familiar with this article?
A. Yes.

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Q. If we could go to page E758, the first column under "Conclusions."
"Despite a" -- sorry, this is the second sentence in the conclusions.
MS. WILLIAMS: Just a second.
All right, go ahead.
BY MR. MILLS:
Q. "Despite a considerable body of literature on the use of GnRHas, few rigorously conducted and controlled prospective studies are available from which to derive evidence-based recommendations."
Do you agree that that's true as to the use of GnRHa agonists in children?
A. So I agree that there's -- so I do believe that there is adequate literature to support the use of GnRH analogs for the treatment of gender dysphoria. These are -- they're not randomized controlled trials as maybe implied here in the conclusion, and so in that way I would agree.
Q. So the statement doesn't say randomized controlled trials. It says, "...few rigorously conducted and controlled prospective studies are available."
You would agree that that is correct, that there are few rigorously conducted and controlled prospective studies available?

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A. I would agree that there's not controlled prospective studies, but there are prospective studies, so in that way I would agree.
Q. The bottom of that paragraph says, "Use of GnRHas for conditions other than CPP requires additional investigation and cannot be routinely suggested."
CPP is central precocious puberty; is that right?
A. That's right.
Q. So the consensus in 2009 was that puberty blockers should not be routinely used for conditions other than central precocious puberty?
A. Can you point me to the sentence that you just read again? I'm sorry.
Q. Yeah, it's the last sentence in the conclusion section.
A. Yeah, so I guess it depends on what they're calling routinely suggested. If they're saying that professionals who are competent in assessing gender dysphoria should not use GnRH agonists to treat gender dysphoria, then I would disagree. If they're -- but if that's -- if they're saying that, then I would disagree. If they're saying that -- that using GnRH agonists routinely without that caveat, then I would agree.

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Q. Which do you read this as saying?
A. I think that they're implying that GnRH agonists should not be used in the way that I'm using them in treatment of gender dysphoria and so, therefore, I would disagree.
Q. Flipping back to page E756, the bottom of the first column, "Outcomes Reproductive Function," the very last line basically in the first column on E756 "Conclusions" --
A. Okay, hold on.
Q. Yep. Yeah, the very last line on E756.
A. Okay.
Q. "Conclusions: The available data suggests that gonadal function is not impaired in girls treated with GnRHas. Nevertheless, available data are limited. Long-term data on fecundity and ovarian reserve of treated patients of CPP are needed."
So in 2009, the effects of puberty blockers for central precocious puberty on fertility were not fully known; is that correct?
A. Well, I'll tell you that there is research related to this question, and I believe I cited it in my report outlining that a group of women treated for central precocious puberty and followed for fertility outcomes appeared to have no diminishment in their fertility.

There's not a pathophysiologic reason that I would expect GnRH agonists to impair future fertility.

As a pediatric endocrinologist, when I'm prescribing GnRH agonists for central precocious puberty, I do not, and I don't think other pediatric endocrinologists, do warn of a risk of infertility.

So with all that said, there's certainly more research that could be done on every topic including this one, but I don't have an expectation that GnRH agonists impair someone's fertility who don't have another reason for impaired fertility.

Q. But would you agree with the consensus statement that long-term data on fecundity and ovarian reserve of treated patients with CPP are needed?

A. I'm not sure that I would agree based on the fact that -- that this isn't something that I -- I don't -- I don't know that the -- I don't think that the question about GnRH agonists causing infertility independently is one that is commonly debated amongst pediatric endocrinologists.

I think that if the -- if the group here that wrote this is saying that they're -- we would benefit from more data to prove this assertion, then I can support that, but I'm not accustomed to weighing the risk of infertility as a potential risk when

deciding about treating central precocious puberty with patients with that condition.

Q. I'd like to show you a follow-up statement to this one, which I'm marking as Exhibit 15.

MARKED FOR IDENTIFICATION:
EXHIBIT 15
12:08 p.m.

BY MR. MILLS:

Q. Entitled "Use of gonadotropin-releasing hormone analogs in children update by International Consortium."

Are you familiar with this article?

A. I'm not sure if I've read this article completely or not.

Q. Sure. You would agree it's titled "Guidelines" at the top?

A. I see the word guidelines there, yes.

Q. Yeah. So on this first page in the middle of the abstract toward the end of the abstract paragraph it says, "Although there have been many significant changes in GnRHa usage, there is a definite paucity of evidence-based publications to support them."

Do you agree with that statement?

MS. WILLIAMS: Counsel, if he hasn't read this, I don't know. Do you feel comfortable?

A. I'd like to at least read the entire abstract --

BY MR. MILLS:

Q. Sure.

A. -- before answering.

Q. Sure.

MS. WILLIAMS: Okay.

A. Okay, what was your question?

BY MR. MILLS:

Q. So the sentence says, "Although there have been many significant changes in GnRHa usage, there is a definite paucity of evidence-based publications to support them."

Do you agree with that description of GnRHa usage?

A. There have been significant changes in GnRH usage.

Q. Sorry. Do you agree that there is a definite paucity of evidence-based publications to support how GnRHas are currently used?

A. No, I wouldn't use the word paucity. I presented research related to the use of GnRH agonists for the treatment of gender dysphoria, so I would -- I would disagree.

But in reading this abstract, it seems like the authors here are -- are intentionally trying to avoid the type of discussion we're having today about

the -- the decision to use GnRH agonists for treatment of gender dysphoria, but rather outlining its use. So I wouldn't -- I wouldn't say that the authors here are -- have been tasked to answer the question about the recommended treatment of gender dysphoria.

Q. You would agree that they are trying to point out what they call the deficiencies in the literature, though, correct?

A. I'm not sure what their intention is.

Q. So on page 365, the start of the second column under -- this is in section "Use of GnRHa and the management of transgender adults" that were in albeit in the second column, the first full sentence.

"The impact on BMD is concerning since lumbar spines e-scores at age 22 years were found to be lower than those observed prior to treatment suggesting a possible permanent decrement in BMD. Thus, it is unclear how long GnRHa can safely be administered."

Do you agree with that statement?

MS. WILLIAMS: Again, do you want to read it? I mean, it's up to you, but I just want to give you the opportunity if you don't recall reading this article.

A. I'll just read Section 7 real quickly and then I can

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respond. Is that okay?
Yeah, so -- so you've read a sentence that's related to bone mineral density questions and the use of GnRH agonists, and this is a pretty big topic that we can certainly talk about. You know, I think that agreeing or not agreeing with this one sentence, you know, is hard for me to do.
I think that bone mineral density is an important topic. It's one that I counsel patients on and talk to them about when we're making use of GnRH agonists and how long to use them, when to assess for bone mineral density, how would we measure this. So it's an important topic.
It would be concerning to me if someone had low bone mineral density at baseline and was planning to using GnRH agonists for an exceedingly long period of time because I would be concerned about their bone density and would want to follow that, but in other clinical scenarios it would be less concerning.
So I think that, you know, there's lots to say about this topic. I agree that it's an important topic and happy to talk more about it.
Q. Sure. My basic question is, do you agree with just the way they put it which is that, "It is unclear how long GnRHa can safely be administered in the context

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of a gender dysphoria intervention"?
A. I think that sentence by itself is hard to -- it's hard to agree with out of context, right?
Q. Sure.
A. So if you're saying that how long GnRH agonists can be safely administered without measurable difference in bone mineral density, sure. Is that difference clinically significant? Does it result in fracture? Does the risk of low bone mineral density outweigh the benefit of the intervention?
So I don't know if -- if asking me if I agree with this, it is unclear how long GnRH agonists can be safely administered without explaining that larger context can make any sense.
Q. Do you think it is clear how long GnRHa can safely be administered?
A. I think in certain scenarios, absolutely. So if I had a patient that has no risk factors for low bone mineral density, has clear gender dysphoria, and has a plan to use GnRH agonists for -- for two or three years, has normal bone mineral density at baseline, I do not have any concern about using GnRH agonists for that patient in terms of their bone mineral density. In other clinical scenarios, I would have more concern.

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Q. What about for six years for that patient?
A. Again, it depends on the clinical scenario. I have some patients that have been treated with GnRH agonists for six years, but if they don't need GnRH agonists that long, then I would prefer not to extend it for that amount of time.
Q. Because of in part of risk to bone mineral density?
A. Yes.
Q. All right. So the next sentence here is, "The effects of GnRHa on adolescent brain maturation are unclear."
Do you agree with that sentence?
A. I think that the question about GnRH agonists on brain maturation is odd for me because I don't -- I don't know that I understand why GhRH agonists would have an effect on brain maturation themselves.
So while I -- I may agree that I haven't seen studies specifically answering that question, I'm also not aware of studies that are outlining a concern related to this question specifically.
Q. So you are aware of no studies showing that there is no effect of GnRHa on adolescent brain maturation?
A. I'm aware that individuals with delayed puberty, for example, don't score different -- differently in cognitive testing, and that delaying puberty in and of itself with GnRH agonists I haven't -- I haven't heard

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of a plausible pathophysiologic reason why that would interfere with brain maturation in the way that's described, but, no, I haven't seen a study outlining exactly what you're asking.
Q. All right. The next sentence says, "GnRHa therapy prevents maturation of primary oocytes and spermatogonia and may preclude gamete maturation, and currently there are no current methods to preserve fertility in early pubertal transgender adolescents."
Just the first part of that sentence, "GnRHa therapy prevents maturation of primary oocytes and spermatogonia..."
A. Spermatogonia.
Q. Thank you. "...and may preclude gamete maturation," do you agree with that?
A. Yes.
Q. And currently there are no proven methods to preserve fertility in early pubertal transgender adolescents; do you agree that that's true?
A. Yes.
Q. If we could go back to Exhibit 2, which was the question and answers you gave on the Michigan website --
A. Do you feel like you're coming up to a good pause break in a little bit?

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Q. Yeah, that sound good. Are you good for just a few more minutes?
A. Sure, yep. Where are we at?
Q. The question and answer document should be marked as Exhibit 2. It's on the second page here, and we are under the heading "What are the risks or benefits of delaying puberty," the third paragraph under that heading.
You say, "We're also really cautious about using medical interventions to treat dysphoria because it delays growth spurts and bone density accrual."
Do you still agree with that statement of your practice?
A. Yeah, I think that the key here is delays because we do expect growth and bone density accrual to occur with future exposure to sex hormones.
Q. If we could go back to Exhibit 8, which was your book chapter and go to page 177. We're under "Special considerations for youth," then under "Bone Density" the second sentence, "When puberty is suppressed at Tanner stage 2, there is a concern for relative decrease in bone mineral density compared to untreated peers." And then skipping the next sentence, "However, another study demonstrated a decline in bone mineral density z-score during GnRH agonist treatment

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without full catchup by age 22."
I think this was the same study that the last source we used discussed.
So you would agree that puberty blockers at a minimum delay growth spurts, right?
A. I just want to go back because you skipped the one sentence that I felt like --
Q. Sure.
A. I'm not sure why you skipped one of the three sentences, but just to read the whole thing might be helpful. But maybe I'm not answering.
You asked a question that was different from I think what you read, so --
Q. Sure.
A. -- what do you want me to address right now?
Q. So puberty blockers at a minimum delay growth spurts; is that right?
A. Yes.
Q. And they delay bone density accrual?
A. Yes.
Q. And there is at least some evidence that bone density may not ever fully catch up; is that right?
MS. WILLIAMS: Objection.
A. So there's -- there's this one study that I'm referencing here that showed catchup, catchup towards

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normal at age 22 in -- I don't remember if it was the -- I think it was the trans girls, maybe it hadn't caught up to the z-score that they were at before.
What I would say is that I haven't heard any -- when we're talking about benefit density and z-scores, what are we really asking? We're really asking about the fracture risk in our elderly years. So what I haven't heard or seen any evidence of is an increased risk for osteoporosis in middle-aged people that were treated with GnRH agonists.
So we can say that GnRH agonists delay bone density accrual, that there's catchup with sex hormone exposure, complete catchup, almost complete catchup. Is 22 measuring too soon? Who knows. I think if we waited longer, we might see complete catchup, but ultimately what we really care about is fracture risk.
So at the -- even with the change in z-score outlined in Citation 34 here, I don't believe that to be enough of a change to result in meeting the clinically significant osteoporosis.
Q. And to go back to what we said earlier, none of your patients that you treated for gender dysphoria are beyond the age of 27; is that right?
A. Correct.
Q. If you could go to page -- the same page 177 the next

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paragraph the start. "There are a few little data regarding the final impact of prepubertal suppression and gender-affirming hormone therapy on stature."
Do you still agree with that statement?
A. Yes.
Q. So you don't know whether the effect of puberty blockers on stature is reversible?
A. Well, I know a lot about how pubertal suppression affects stature and talk about it with every single patient that I see.
Q. But you don't know whether the effect of puberty blockers on stature is reversible?
MS. WILLIAMS: Objection.
A. Well, I -- so just to be clear, stature means final height. So if you are -- so I would expect that the use of GnRH agonists in combination with gender-affirming hormones does have an effect on stature. That, for example, a trans boy who has delayed fusion of growth plates and then a more robust growth using testosterone may achieve a slightly taller stature than otherwise, which is typically very exciting for a trans masculine person who might be at risk for short stature. And for trans feminine folks the use of GnRH agonists plus estrogen may result in a slightly shorter final stature, lots of evidence to

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support that notion I think I haven't seen, but just as a pediatric endocrinologist understanding how these hormones work and how kids grow, I think that GnRH agonists do have an impact on stature, usually an impact that is desired.

BY MR. MILLS:

Q. Just a couple more if you're okay. Getting close.

I'm going to show you an article that you coauthored, marking as Exhibit 16, in the Journal, looks like, of Clinical Endocrinology.

MARKED FOR IDENTIFICATION:
EXHIBIT 16
12:27 p.m.

BY MR. MILLS:

Q. And are you familiar with this article?

A. Yes.

Q. And you were a coauthor on it?

A. Yes.

Q. If we could look at page 1565, the second paragraph. So it begins, "The literature on the impact of GAHT," which is I believe is gender-affirming hormone therapy, "in transgender youth is limited."

Would you agree with that sentence?

A. Well, I believe this is talking about bone density, correct?

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Q. That's right.

A. So I think it -- in this paper we are outlining the literature, so I guess it's up to the reader to say how limited it is.

I would say that it's -- it's limited to the extent that these are the main articles that we have to reference. So there is -- there is data to -- to review to answer questions about bone density, but certainly more -- more study on this topic is welcomed.

Q. The second to last sentence of that paragraph, "In one of the largest studies of bone mass development, trans girls had low BMD z-scores at the initiation of the study and after three years of estrogen therapy." I believe this was the same study we were just talking about.

Do you still agree that this is one of the largest studies of bone mass development?

A. Yeah, so if we -- if we explore that sentence a little bit more, the interesting thing here is that trans girls start with low bone mineral density before treatment and then continue to have low bone mineral density at the end of treatment. So it's interesting that there is this difference in baseline bone density in trans girls which, you know, there's -- there's

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potential reasons why that -- that may be, but this isn't saying that bone density in those girls worsened from its baseline z-score.

Q. Your next sentence says, "These findings raise concerns about prolonged GnRHa therapy with and in some" -- sorry -- "without and in some groups with sex hormone therapy on bone health in transgender youth and adults."

Do you agree that the findings raised concerns about prolonged GnRH therapy without and sometimes with sex hormone therapy on bone health?

A. Bone health is certainly a factor that we're using when we're making decisions with patients and families about GnRH agonists length of time on them. I think that GnRH agonists serve a purpose for patients with gender dysphoria, but shouldn't be used in the absence of other -- of -- of an indication for use for gender dysphoria.

Q. So are you saying you no longer have concerns about prolonged GnRH therapy --

A. I would have concern -- sorry. I would have concern about using GnRH agonists longer than required unnecessarily because that would potentially be -- there would be potential risk to bone density without subsequent benefit.

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Q. And you don't have data about how long GnRHa can safely be administered?

A. I think I answered that question.

Q. Page 1567, the bottom of the first column. This is about four sentences up from the bottom. The sentence is connected to Citation 506.

"Further research is also needed to determine optimal timing and duration of gonadotropin hormone agonist therapy in transgender youth as it relates to bone health and to determine the prevalence of osteoporosis, osteopenia, and fractures among transgender youth and adults."

Do you still agree with that sentence?

A. I think more research in this area would be great.

Q. On page 1569 in the second column, the first full paragraph the second sentence, "Prospective studies are needed to determine the timing and duration of gonadotropin hormone agonist therapy in transgender youth that optimizes peak bone mass"; do you still agree with that sentence?

A. I think a specific study to help address that question would be wonderful, but the fact that a study doesn't exist doesn't preclude me from safely using GnRH agonists.

Q. But you wrote last year that, "Prospective studies are

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needed to determine the timing and duration of GnRH therapy," correct?
A. Sorry, I wrote what?
Q. You wrote last year that, "Prospective studies are needed to determine the timing and duration of GnRHa therapy in transgender youth that optimizes peak bone mass," correct?
A. I'm not sure I wrote that sentence, but it's in this article that I'm authored on.
I agree that more studies on prospective studies on this topic would be needed to help answer that question more definitively, but still doesn't preclude me from using GnRH agonists.
Q. Do you recall giving a talk at the University of Michigan around October 21st, 2027 [sic] with a co-presenter Dr. Ellen Selkie entitled "Doctrine care for transgender children and adolescents?
MS. WILLIAMS: Objection. I think 2027.
MR. MILLS: 2017.
BY MR. MILLS:
Q. Yeah, a talk at University of Michigan October of 2017 with Dr. Selkie, do you recall that talk?
A. I'm not sure that I have a strong memory of it, but I certainly know Dr. Selkie and believe you that I gave this talk.

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Q. Sure. You've coauthored papers with Dr. Selkie, right?
A. Yes.
Q. So you agree she is knowledgeable in this field?
A. Yes.
Q. Okay. I just have a short video clip I wanted to show you which I don't know how we marked it, but it would be Exhibit 17, I believe.
MARKED FOR IDENTIFICATION:
EXHIBIT 17
12:34 p.m.
COURT REPORTER: And I will not be taking it down stenographically.
MR. MILLS: Okay.
A. Sorry, what year is this?
BY MR. MILLS:
Q. 2017.
A. So that's what I used to look like?
(Video playing.)
BY MR. MILLS:
Q. You were talking about puberty blockers here --
A. Yes.
Q. -- is that right?
So blocking puberty would prevent pubertal development during the same time as one's peers,

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correct?
A. Yes, the average peer in that age group would be going through pubertal changes.
Q. And that effect would be irreversible, right?
A. What effect exactly?
Q. In other words, you could not go back in time and go through puberty as the same time as one's peers did?
A. That's correct.
Q. And could that disconnect negatively effect a person's psychological well-being?
A. I think that -- I hear from patients that -- that as they're seeing their peers start puberty, oftentimes they're hoping that they will soon be able to go through puberty as well so, yes, that can be socially difficult.
Q. And it sounds like it can cause -- can cause social distress?
A. In patients that were -- that are feeling social distress related to a delay in their puberty, that social distress would be less than the distress associated with the -- going through endogenous puberty or else the GnRH agonist wouldn't be indicated.
Q. But blocking of puberty could cause social distress, correct?

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MS. WILLIAMS: Objection.
A. Social distress in the way that we've been discussing a desire to be progressing through puberty with -- at the same age as other peers, yes, but typically that would be in a pubertal direction aligned with their gender identity.
BY MR. MILLS:
Q. Puberty is also connected to emotional development; is that right?
A. So I think that emotional development does occur in adolescent years. How much of that is related to chronologic age progression versus pubertal progression I think is open to discussion, but I would -- I would posit that simply chronologic age progression also is important for emotional development.
Q. But by blocking puberty, you are at least delaying some aspect of emotional development, correct?
A. To whatever extent pubertal progression is related to emotionally development, yes, but again I would argue that chronologic age progression is I would think more important for emotional development.
I can't point to a citation to -- to make that point. I would say as a pediatric endocrinologist seeing patients with delayed puberty,

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I don't consider those patients to be emotionally stunted due to their delayed puberty, so in that way I would -- I would downplay the point that emotional development is somehow stunted by using GnRH agonists.
Q. But you'd agree that a person whose puberty has been blocked would not have the same emotional development pathway as their peers who are going through puberty?
A. I think that's hard for me to say. I don't -- I don't know that I have a specific expertise in emotional development, but I would say that -- that I don't see clinically patients with emotional immaturity compared to peers simply because they're on GnRH agonist treatment.
MR. MILLS: I think that's a good stopping point, if that works for everybody.
(Recess taken at 12:39 p.m.)
(On the record at 1:42 p.m.)
BY MR. MILLS:
Q. I'm handing you what I'm going to mark as Exhibit 18.
MARKED FOR IDENTIFICATION:
EXHIBIT 18
1:42 p.m.
BY MR. MILLS:
Q. This is an article you coauthored, "Gender affirming multidisciplinary care for transgender and nonbinary

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children and adolescents."
Do you recognize this article?
A. Yes.
Q. If we could flip to page 108. At the very bottom it says, "Longitudinal studies from Amsterdam Clinic patients document that only 1.9 percent of adolescents stop puberty suppression and did not go on to start GAHT gender-affirming hormone therapy."
Is this consistent with your experience?
A. I would say that the majority of patients that are prescribed pubertal suppression do go on to start gender-affirming hormone therapy. In my experience, the number is higher than 1.9 percent.
Q. About what percent would you say it is in your experience?
A. I think only about 5 percent.
Q. So that would mean that somewhere between, if you use this study, in your experience 95 to 98 percent of patients who start puberty blockers will go on to cross-sex hormones; is that right?
A. Yes, which makes sense given that the progression into Tanner stage 2 is that sort of predictive time where we're better able to understand the persistence into adulthood of one's gender identity, but still the pubertal suppression is used to take that extra time,

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so I think that lower number is a testament to the ability to accurately diagnose gender dysphoria and prescribe pubertal suppression to the correct candidates.
Q. So a provider should assume that a patient prescribed puberty blockers is almost certain to progress to hormonal therapy?
A. That is definitely not how I think about it. I would say that when I'm prescribing pubertal suppression I am myself keeping a very open mind and encouraging the patient and the family to keep an open mind to allow continued exploration of gender identity during that time of pubertal suppression and make no assumptions.
Q. But as a matter of fact, you know that 95 percent -- 95-plus percent of those patients will go on to hormonal therapy?
A. That's right. So I need to be cognizant of the fact that for the ones that don't, I need to, you know, help -- help to recognize when discontinuation of pubertal suppression is appropriate with patients that no longer require it.
Q. So would you consider hormonal therapy part of the standard course of treatment for gender dysphoria that starts with puberty blockers?
A. It's -- the treatment with gender-affirming hormones

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is part of the recommended -- is a recommended option for therapy to treat gender dysphoria as outlined by WPATH and the Endocrine Society, yes.
Q. I guess what I'm asking is, if it's 95 to 98 percent who go on to hormonal therapy, would you consider that to be the standard course of treatment?
A. I don't consider therapy to be a standard course of treatment. I consider every patient to be an individual person with individual needs and decisionmaking.
Q. Do you tell patients that 95 to 98 percent of those who start puberty blockers will go on to cross-sex hormones?
A. I'm not sure if I've used those exact percentages, but I -- I talk in great detail about the potential for transition to gender-affirming hormones when starting pubertal suppression.
Most patients and families assume that they will progress to hormones because they feel stable in their gender identity, and yet it's my job to continue to think critically about each patient and help them to think critically about themselves.
Q. And so do you tell families the risks of cross-sex hormones before you start puberty blockers?
A. I do talk about the implications of pubertal

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suppression followed by gender-affirming hormones when starting pubertal suppression, yes.
Q. And do you think that is the best practice to use before prescribing puberty blockers?
A. Yes.
Q. If we could go back to Exhibit 1, which is your Advances in Pediatrics article. We're on page 10, and this is the third full paragraph about five sentences in. It starts, "Although the effects." It's right after footnote 57, if that helps.
A. Yep, okay.
Q. So it says, "Although the effects of GnRH agonists are reversible, they are often started with the intent of initiating cross-sex hormones later on, and the combination of the two results in permanent and semipermanent effects."
So would you agree with just the first part of that sentence still that puberty blockers are often started with the intent of initiating cross-sex hormones later on?
A. I'm not sure I love the word intent. I think that the -- I'm oftentimes meeting with a patient that has very clear -- has been very clear in their gender identity from a very early age, and I may think to myself that it's very, very unlikely that that gender identity

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will change and that it would -- it is very, very likely that this person will be eligible for -- for gender-affirming hormones in the years to come, but I'm still using my diagnostic abilities and working with patients each time I see them to confirm that the trajectory of the plan is still correct.
Q. So do you disagree with what you wrote in 2017 which is that puberty blockers are often started with the intent of initiating cross-sex hormones later on?
A. I think I'm talking about the semantics of the word intent, so I don't disagree with the premise that when we're starting cross-sex -- when we're starting GnRH agonists, many of those patients will start gender-affirming hormones.
Q. Okay.
A. But I would just maybe point out that the intent can change as a patient's clinical course change -- changes.
Q. And then the second half of that sentence of what we just read, "The combination of the two results in permanent and semipermanent effects," do you still agree with that?
A. Yes.
Q. I would like to show you what I'm marking as Exhibit 19, which is a book chapter you wrote in

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"Pubertal suppression and transgender youth."
MARKED FOR IDENTIFICATION:
EXHIBIT 19
1:50 p.m.
BY MR. MILLS:
Q. That word continues to be a challenge.
Anyways, I believe after the front matter I've just excerpted your chapter from this publication. Do you recognize --
A. Yes.
Q. And you coauthored this chapter?
A. Yes.
Q. If we could turn to page 80 in the chapter. The first full paragraph toward -- the last sentence of the first full paragraph it starts with, "The intervention with a GnRH agonist." Do you see that?
A. Mm-hmm, yes.
Q. So I'll just read that. "The intervention with a GnRH agonist is "reversible" and allows time for a further gender identity exploration prior to committing to feminizing medications." And then you say, "Initiation of treatment with a GnRH agonist in a transgender girl at pubertal stage 2 requires discussion about several other considerations. The adolescent will continue to grow, but at a prepubertal

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speed while on GnRH agonist therapy.
"If estrogen is initialed later in adolescence, a growth spurt and subsequent growth arrest will occur likely resulting in a shorter final adult height than if no intervention were pursued."
Do you still agree with that section that I just read?
A. Yes.
Q. So skipping one sentence, but now we're talking about -- yeah, so skipping one sentence, "Spermatogenesis will not occur if puberty is suppressed. Therefore, a child treated with GnRH agonist medication followed by estrogen would not have the opportunity to preserve sperm using the standard methods."
Do you still agree with that what I just read?
MS. WILLIAMS: Objection.
A. Yeah, so I agree, but I would probably say if I were to, you know, rewrite the sentence, spermatogenesis will not occur while puberty is suppressed, because I think the sentence misses the element of the conversation we were having earlier about how one may still have the potential for fertility if they elect to go through puberty at a later time endogenously.
But the point remains that discussions

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around -- around the use of hormones and fertility matters are important to discuss when counseling patients and families on pubertal suppression.
Q. So is the reason you put reversible in quotation marks in this passage because, as the next paragraph explains, if you follow up puberty blockers with estrogen, then the consequences are not all reversible?
A. I'm not sure that that's the reason I put it in quotations. I think I put it in quotations because that's a word that's taken from the early Dutch protocol literature where they were using words like reversible, partially reversible, and irreversible to describe the GnRH agonist hormones and surgery.
Q. But you would agree that following puberty blockers with estrogen results in irreversible changes?
A. Yes. For example, breast development.
Q. In your clinic, do you use an informed consent form before starting puberty blockers?
A. We do not use an informed consent form in our -- in our clinic.
Q. And is that true also you don't use a form before starting cross-sex hormones?
A. Correct.
Q. Puberty blockers were historically used in the

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chemical castration of rapists; is that right?
A. I do believe that that's been attempted.
Q. And men taking GnRH agonists for prostate cancer experience a complete loss of sexual interest; is that right?
A. I don't know that that's always the case.
Q. Is it usually the case?
A. I don't know, I don't treat prostate cancer, but I know that men with low testosterone can have decreased libido, but I don't know if I would describe that as in the terms that you described.
Q. Sure. If we could go to page 83 of this same chapter. The last sentence before the estrogen heading at the bottom of this second column, the last sentence before estrogen, "Testosterone treatment likely increases the risk of polycythemia, sleep apnea, weight gain, and cystic acne, and possibly increases the risk of elevated liver enzymes, hyperlipidemia and hypertension"; you still agree with those -- that statement of risks?
A. Yes.
Q. On the next page right before conclusions, the sentence before conclusions, "Estrogen treatment likely increases the risk of thrombolic embolic disease, particularly synthetic ethanol, estradiol,

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hypertriglyceridemia, gallstones, elevated liver enzymes, and weight gain, and may increase the risk of hypertension and hyperprolactinemia."
Putting aside my butchering of scientific words, do you agree with that statement of the risks of estrogen still?
A. Yes. I also just point out that this would be the case if we were using estrogen to treat cisgender women with low estrogen, and the concerns about the potential risks of testosterone would be the case if we're treating cisgender men with low testosterone, and this is why we know how to prescribe these medications appropriately and monitor patients on these medications.
Q. And what is -- what is venous thromboembolism?
A. Blood clots.
Q. And is that life-threatening?
A. It can be.
Q. And long-term estrogen administration to a male increases the risk of those life-threatening blood clots?
MS. WILLIAMS: Objection.
A. I would -- I haven't had a patient that has had this condition, but I would say that women are at higher risk for venous thromboembolism than men, and treating

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a trans woman with estrogen puts her in a similar risk category as other women due to that fact that estrogen is a prothrombotic hormone.
BY MR. MILLS:
Q. So long-term estrogen to a biological male does increase the risk of thromboembolic events?
A. In the absolute sense, yes. I like to explain that when someone is being treated with gender-affirming hormones, you are adopting the health -- health risks of the affirmed sex and maybe eschewing the health risks of the sex assigned at birth.
A common example that I use with testosterone would be going bald. If you never started testosterone, you probably would never go bald. If you take testosterone, you've got the same chance of going bald as brothers in your family, and the same holds true with other medical problems that are sex specific if they're related to hormones.
MARKED FOR IDENTIFICATION:
EXHIBIT 20
1:59 p.m.
BY MR. MILLS:
Q. I'm showing you what I've marked as Exhibit 20, which is an article by Getahun and others entitled "Cross-Sex Hormones and Acute Cardiovascular Events in

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Transgender Person." I believe this is one of the articles you cited in your report.

If you would flip with me to page 11, on the second column the first full paragraph.

"A distinguishing feature of our study is that it represents one of the largest cohorts of transgender persons in the United States, and to our knowledge is the only study of this size that carefully validated trans feminine or transmasculine status in the participants."

And then going over to page 212, the bottom paragraph in the first column.

"In summary, the presence that he demonstrated that cross-sex estrogen is a risk factor for VTE and probably ischemic stroke among trans feminine persons."

And then going back to page 209. Again, the bottom paragraph of the first column.

A. Sorry.

Q. Yep, 209. So this is the last paragraph in the first column.

"The trans feminine cohort had an increase in post index date incidents of VTE compared with either referenced cohort, and the difference seem more pronounced with increased follow-up with two- and

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eight-year risk differences of 4.1 and 16.7 per 1,000 persons relative to cisgender men and 3.4 and 13.7 per 1,000 persons relative to cisgender women."

So the -- the authors of this study found that transgender females on estrogen were significantly more likely to have a VTE compared to cisgender males; is that right?

A. Yes.

Q. And they were also much more likely to have a VTE compared to cisgender females?

A. So let me just read these numbers again.

Q. Sure.

A. So I guess it's depending on your -- your -- how you'd like to use the term "much more likely." This is saying that, if I'm reading it correctly, that out of every thousand persons there was three more that had this event in the two-year follow-up, and 13 more out of a thousand in the eight-year follow-up, so that's more and statistically significant. Whether that is clinically significant or meaningful in a way that would prevent someone from deciding that the benefits of estrogen outweigh the risks is maybe a different question.

But I would also say that we have in pediatrics the risk for thromboembolism is extremely

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low, so this article is talking about adult patients, and so the -- when I'm seeing a patient with a clotting problem, I oftentimes consult with my hematology counterpart to discuss safety of estrogen treatment.

Transdermal estrogen is known to be less thrombogenic than oral estrogen, so we make that decision that someone has a higher thrombotic risk, but in general, young healthy adolescents are at very low risk for clotting regardless of whether they're treated with estrogen.

Q. And that's not true of adults, correct?

A. Adults have a higher risk for clotting compared to adolescents.

Q. And what proportion of the patients you start on hormonal therapy continue as adults, to your knowledge?

A. The majority continue as adults. So if I was an adult endocrinologist reading this article, I would be using that to make decisions on the administration route for estrogen based on the patient's thrombotic risk factors.

Q. But you don't consider these statistics when you're considering whether to decide -- whether to start an adolescent on hormonal therapy?

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A. Well, I just explained how I do consider it. I am assessing a transgender girl's thrombotic risk if she has thrombotic risk factors, then consulting with hematology and oftentimes changing the route of administration of the estrogen.

Q. But you're not considering the risk of that same girl once she becomes an adult?

A. I wouldn't say that that's true. I would say that that same girl would continue to see an adult provider who would continue to assess her thrombotic risk.

Q. Do you tell patients considering estrogen that they may be at significantly higher risk for a VTE compared to cisgender males or cisgender females?

A. I do talk about increased thrombotic risk and advise patients to not smoke cigarettes because that increases everyone's risk for clotting, which is a common thing to avoid when anyone is taking any form of estrogen.

Q. If we could go back to Exhibit 8, which was the first chapter we talked about from the transgender medicine book. If we could go to page 178 of your chapter, the start of the second paragraph under, "Fertility."

"Development of mature sperm and oocytes occurs during puberty, therefore, progressing through natural puberty is a requirement for fertility."

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Do you still agree with that statement that progressing through natural puberty is a requirement for fertility?
A. Yes.
Q. And by natural puberty you mean puberty of the person's biological sex?
A. I mean endogenous puberty, puberty created by the body itself.
So if you have a person that has hypogonadism and is cisgender, you'd be giving them hormones, but that person would not be able to reproduce either. Does that make sense?
Q. But I guess I'm asking a slightly different question which is that progressing through puberty of the person's biological sex is a requirement for fertility?
A. You have to go through puberty aligning with your biologic sex using your own body's hormones, yes.
Q. If we skip -- skip a sentence and then right after the number 36 you say, "Patients considering GnRH agonist therapy for gender dysphoria may not decide to allow their natal puberty to progress in later adolescence choosing instead to bridge to gender-affirming hormone therapy. If that decision is made, there will never be maturation of sperm or eggs and no opportunity for

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gamete preservation."
Do you still agree with what I just said?
A. Yes. Someone that was on GnRH agonists followed by hormones and continues on hormones will not have maturation of their germ cells.
Q. So they would be infertile?
A. At the present time, yes. If that person desired fertility, then again I would advise them to discontinue their hormones.
Q. So skipping the short paragraph right after the number 21, "Patients presenting after puberty should be advised that future fertility could be compromised by prolonged use of gender-affirming hormones."
Do you still agree that future fertility could be compromised by prolonged use of gender-affirming hormones?
A. Yes.
Q. If we go back to Exhibit 1, which was the Advances in Pediatrics, and we go to page 10, and this is about midway through the big paragraph closer to the bottom, the sentence starts with, "A child who starts on GnRH agonist therapy." Just let me know if you see it.
A. I got it.
Q. Okay. "A child who starts on GnRH agonist therapy at a similar stage 2 and continues on the" -- I think it

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should be "medication as cross-sex hormones are introduced later in adolescence will never have spermatogenesis or menarche and will not have the opportunity to bank gametes using cryopreservation."
Do you still agree with that statement?
A. This is almost the exact same statement that we just read, so I have the same answers.
Q. So that's a yes?
A. Well, I think that that person would not have -- they would not be fertile while taking these interventions, and if they desired fertility, my advice would be to discontinue treatment.
Q. Unless putting aside the possibility of discontinuing treatment, this child would never be able to reproduce naturally or artificially?
A. Well, that's a weird way to say it. If you discount this option, then -- then you never could do it? That's not how I typically would talk.
Q. Well, that is my question.
A. Okay, can you say it again?
Q. Yeah. So putting aside the possibility of discontinuing treatment, this child could never reproduce naturally or artificially, correct?
A. So I think that that's not 100 percent accurate for -- in terms of some protocols, and at -- at some centers

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transgender men could be stimulated to ovulate despite not having gone through puberty, and this -- this is a -- and germ cells can be harvested from testicular tissue.
None of this is standard of care or outside of what I would say experimental, but to say never, I'm not sure that I can agree with that completely given the experimental progress of genetic -- of fertility science.
Q. And are you aware of children being born using those experimental methods?
A. No.
Q. So if we take a biological male who starts puberty blockers at Tanner stage 2 and then goes on to estrogen, let's say he continues those interventions until age 45 then decides to align with his biological sex and holds treatment, would he go through natural male puberty at age 45?
A. I don't know the answer to that question, but I think that it's probable that he would.
Q. You're aware of no evidence showing that he would?
A. I'm not aware of anyone that has done that to prove whether it would be possible.
Q. How likely is it do you think that he would be able to successfully reproduce?

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A. I don't know how likely it would be. I think that his fertility could be compromised.
Q. Do you think there's a greater than 50 percent chance that his fertility would not develop?
A. Yes.
Q. Same question for a biological female. If she goes through puberty blockers at Tanner stage 2 and then testosterone and then discontinues interventions at age 38, can she go through female puberty and become -- and have a child?
A. There's a couple of different variables here, of course, because the female potential for fertility is marginal even in cisgender women at 38 sometimes, so I would say it's possible, but I think that it would be more likely at a younger age.
Q. Do you think the chance in the scenario I outlined would be less than 50 percent that she would be able to reproduce?
A. I'm less certain that it would be less than 50 percent in this scenario than in the biologic male scenario.
Q. And why are you more certain in the biological male scenario?
A. It seems to take less time for the -- the ovary to produce oocytes after suppression compared to spermatogenesis.

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Q. So if these -- if these individuals, and just talking generally about adolescents who started at puberty blockers at Tanner stage 2 and then went on to cross-sex hormones, if they were to halt that treatment and start going through their biological sex puberty, would that also mean that they would develop secondary sex characteristics associated with their biological sex?
A. Yes.
Q. So if they wished to remain living with their transgender identity, this would likely heighten their distress?
A. That's possible, yes.
Q. So a male who -- a biological male who wishes to be able to reproduce would then suffer a permanently lower voice?
A. In order to progress far enough into male puberty to have spermatogenesis, I would expect the voice to deepen.
Q. And a female who wishes to reproduce would suffer breast enlargement that would only be reversible via surgery?
A. Yes.
Q. And so when you say that they can choose to become fertile later, that would come at the cost of the

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irreversible effects that you're avoiding to begin with puberty blockers; is that right?
A. Yes.
Q. And do you tell patients that?
A. Yes.
Q. And are you aware of any literature discussing that issue?
MS. WILLIAMS: Object to form.
A. Yes. That's -- we talked about a lot of issues, but there's certainly literature that I highlighted in my rebuttal report outlining how -- how patients and families think through fertility conversations when considering gender-affirming care.
BY MR. MILLS:
Q. But you aren't aware of any long-term outcome studies examining patients who started puberty blockers at Tanner stage 2 then progressed to hormonal therapy and then wanted to become fertile, correct?
A. Correct, and so that is something that needs to be discussed when considering treatment.
Q. And you're not aware of any literature studying that specific issue; is that right?
A. Is that different than the question you just asked?
Q. Yeah. So my first question is about long-term outcome studies.

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A. Okay.
Q. But is there any literature about that specific issue? Again, thinking about the cohort of patients who started blockers at Tanner 2 and then went on to cross-sex hormones and then wanted to become fertile, are you aware of any literature that tries to examine what happens with those patients?
A. No literature talking about what happens to those patients. The topic is obviously discussed in the literature we've been reviewing together.
Q. If we could go back to Exhibit 19, which is, I believe, the other book chapter. This is page 79, the first column in the middle. It's about three sentences -- sorry, two sentences before footnote 7.
A. Okay.
Q. It starts, "Fertility for transgender men on sex steroid treatment testosterone has not been well studied."
Do you agree with that sentence still?
A. I think since that publication there's been a bit more literature on the subject, but I -- I would still agree with that statement.
Q. Has there ever been a live birth using sperm from a male who was administered puberty blockers at Tanner stage 2 followed by cross-sex estrogen?

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A. I don't know.
Q. But you're not aware of one?
A. No.
Q. Have you studied the literature regarding mental health problems in adolescents -- sorry -- in adults -- I'll start over.
Have you studied the literature regarding mental health problems in adults resulting from sterility?
A. No.
Q. And are you aware of any literature exploring mental health problems in adults resulting from sterility caused by puberty blockers, cross-sex hormones, or potential transition surgeries?
A. Not that I'm aware of.
Q. I'd like to show you what we'll mark as Exhibit 21, which is a short research presentation that you're listed as a coauthor on.
MARKED FOR IDENTIFICATION:
EXHIBIT 21
2:21 p.m.
BY MR. MILLS:
Q. Was this a study done through your clinic?
A. Yes.
Q. So on page 209, this table in the first block on the

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right under quote, it says, "A 17-year-old trans woman gave the quote, "I have lost 100 percent of my sex drive, all of it.""
Was this one of your patients?
A. I don't know who it was because it's a deidentified study.
Q. But all of these adolescents were recruited from your gender clinic?
A. There's seven physicians in our clinic so I don't know if I took care of this patient or not.
Q. But this was a patient in your clinic?
A. Yes.
Q. Did you have any follow-up indicating that this changed?
A. Again, this is a deidentified study so I don't know who this is.
Q. Have you seen this in other patients, trans female patients?
A. Diminishment in sex drive? Yes.
Q. Would you say that's common?
A. I would say it's not uncommon. Sometimes patients report, for example, diminishment in erections as a very positive finding, positive effect of hormone treatment.
It's something that I ask about when I'm

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treating trans feminine individuals, and if it is a problem, then it's something that we would discuss and potentially address.
Q. Are you familiar with Marci Bowers?
A. Yes.
Q. She is president of WPATH; is that right?
A. Yes.
Q. And she's one of the foremost surgeons in the field of gender transition, right?
A. She's a well-respected surgeon, I would agree with that.
Q. You said in your report that, "Uniformly, providers in this field are motivated by a desire to promote health and well-being in adolescents."
Would you say that about Dr. Bowers?
A. I don't know Dr. Bowers other than as the president of WPATH and a surgeon that I've heard of that is well-respected in the field, so beyond that I can't say.
Q. Well, your report says, "Uniformly, providers in this field are motivated by a desire to promote health," so I'm just wondering if that applies to Dr. Bowers.
A. I would think so, although Dr. Bowers isn't a pediatric endocrinologist. She doesn't do the type of care that we're discussing today.

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Q. Would you say that -- would you say that Dr. Laura Edwards-Leeper is motivated by a desire to promote health and well-being in adolescents?
A. I'd hope that anyone that's a licensed professional in any field is motivated to do good. To speak specifically about individuals, makes me uncomfortable.
Q. Would you say that about Dr. Paul Hruz?
A. I think that Dr. Hruz also has the best interests of children in mind and wouldn't disparage any person individually for any reason.
Q. And would you also agree that legislators in Alabama who voted this law are motivated by a desire to promote well-being in adolescents?
A. I would hope so, although my hope is that by listening to experts in the field that they would decide that their -- that their output in that regard falls short.
Q. You're not aware of any evidence, though, that legislators in Alabama who voted for this law were motivated by transgender animus?
A. No.
Q. I'm going to show you what I'm marking as Exhibit 22, which is an article in the Carolina Journal at Duke.
MARKED FOR IDENTIFICATION:
EXHIBIT 22

2:26 p.m.
BY MR. MILLS:
Q. If we could go to page 3 of the article it says, "Bowers" -- the second paragraph, "Bowers seemed to acknowledge these challenges saying that, "Really about zero biological males who fought puberty at the typical Tanner 2 stage of puberty around 11 years old will ever go on to achieve an orgasm.""
Did I read that correctly?
MS. WILLIAMS: Have you had a chance to read this article?
A. (Witness shakes head in the negative.)
MR. MILLS: I'm not going to be asking about other parts of this article.
A. Yes, you read that correctly.
BY MR. MILLS:
Q. Is that consistent with your clinical experience?
A. No.
Q. What percentage of your biological male patients would you say who block puberty at the typical Tanner stage 2 go on to achieve an orgasm?
A. I don't -- I don't have a number for you, but just to explain why I said no, even prepubertal children can have that -- the rhythmic orgasm of the muscles of the phallus when exposed to stimulation, so I think that

that -- I'm not sure if -- I'm not sure what the context of the conversation is, but I think that one thing that I do talk a lot about with patients is that the process of going through masculinizing puberty is important. It is -- in male adolescents the process of going through male puberty at a time where they explore their bodies in a different way than a trans girl would on pubertal suppression, and so the way that that person may choose to be intimate would be affected by pubertal suppression, and so those sort of -- those sort of topics are again something that I do spend time on talking about with patients and families considering pubertal suppression.
Q. Would you agree that most biological males who block puberty at Tanner stage 2 then progress to estrogen will never achieve an orgasm assuming they continued the estrogen?
A. I don't know.
Q. Do you tell biological males considering puberty blockers that you don't know the answer to that question?
A. I talk to them about the topic that I just discussed with you in a similar way to what I -- how I discussed it, but don't -- I don't -- I don't talk about orgasms specifically.

Q. So you think Dr. Bowers is wrong?
A. I don't know the answer to that question other than to state that I believe that even prepubertal boys can achieve orgasm, and so I -- I don't -- I don't know what to say more than that.
Q. How often do prepubertal boys have orgasms? What percent of boys do you think experience that?
A. It would be a very low percentage. Remember that prepubertal boys don't have sex or interact with their genitals in a sexual way, the same way that an adult trans woman may learn to do.
Q. So if we set aside the very low percentage of boys who had prepubertal orgasms, would you then agree that Dr. Bowers is correct that the biological male who blocks puberty at Tanner stage 2 then progression to estrogen and continues estrogen will never achieve an orgasm?
MS. WILLIAMS: Objection.
A. I don't know the answer to that question.
BY MR. MILLS:
Q. I'm going to be showing you something which is marked as Exhibit 23, which is an article from the Free Press entitled, "Top 10 doctors blow the whistle on sloppy care."
MARKED FOR IDENTIFICATION:

EXHIBIT 23
2:30 p.m.
BY MR. MILLS:
Q. I think we can go to page 5 of this article at the very bottom of the page of page 5.
A. Which part of page 5?
Q. Yeah, the very last part of page 5.
A. Okay.
Q. So I'll read it. "Bowers told me she now finds early puberty blockade inadvisable. I'm not a fan of blockade at Tanner 2, I really am not. She told me using the clinical name Deniliquin the first visible signs of puberty manifest, the idea all sounded good in the very beginning. She said, "Believe me we're doing some magnificent surgeries on these kids and they're so determined and I'm so proud of so many of them and their parents. They've been great, but honestly I can't sit here and tell you that they have better or even as good results. They're not as functional. I worry about their reproductive rights later. I worry about their sexual health later and ability to find intimacy.""
Do you disagree with Dr. Bowers?
A. I don't disagree. I think she's talking about sort of this process of what is Tanner 2. You know, if you

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say that the very first -- very first sign that a testicle has grown slightly larger as Tanner 2, that's not really allowing a child -- a young trans girl to have tangible evidence of secondary sex characteristics, so I wouldn't -- I would similarly not advise using blockers at the very first whiff of puberty, but that you really do need to experience some pubertal development in order to help that diagnostic pathway.

And what Dr. Bowers is saying is that the longer someone goes into puberty, she's feeling like there's better surgical outcomes, so that -- this is a topic that comes up when we're talking about the timing of starting GnRH agonists.

Q. So she says, "I'm not a fan of blockade at Tanner 2 anymore," but in the chart we looked at in your publication earlier, Tanner 2 is when you listed starting puberty blockers. So I guess I'm not seeing where she's redefining what Tanner 2 is.

Are you saying she's talking about a different stage than you're talking about?

A. Nope. I'm saying that these topics are something that we would talk about with patients when we're deciding when to intervene with GnRH agonists. So for some patients the progression past Tanner 2 would be so

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disruptive from a mental health standpoint that any of the advantages that Dr. Bowers is talking about would not outweigh the risk of waiting longer to intervene.

So just like all of the different topics that we've been talking about, the potential risks and benefits of GnRH agonist therapy, these are really important things to have conversations with patients and families about.

Q. So would you say that you are not a fan of blockade at Tanner 2?

A. I'm a fan of blockade at Tanner 2 if it's clinically indicated.

Q. And do you disagree with Dr. Bowers that patients who are blocked at Tanner 2 are not as functional?

A. I don't know what she means by that.

Q. I assume she means sexually functional; do you agree with her?

MS. WILLIAMS: Objection.

A. I do think that there could be benefit from a sexual function perspective to wait longer to block -- to use GnRH agonists, and from a gender dysphoria standpoint advantages to intervening sooner.

BY MR. MILLS:

Q. If we could go back to Exhibit 1, which was your article from Advances in Pediatrics. This is on page

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13 of Exhibit 1, and this is the last full paragraph on page 13, a sentence that starts with "While."

You say, "After a while," you say, "long-term health data is sparse with regards to adolescents."

Do you still agree that long-term health data is sparse with regards to adolescents on medical gender transition?

A. No. I think that since 2016 there's been quite a bit of literature outlining that type of data.

Q. So in the eight years since 2016, you think there is now long-term health data that is not sparse?

A. I think that there's -- there's long-term health data that I would not -- not classify as sparse.

Q. And which studies would those be?

A. I think the -- the -- the retrospective studies by Turban are an example of -- of longer-term data suggesting benefits of gender-affirming care for adolescents.

We have more longitudinal studies such as the Chen study outlining outcomes on gender-affirming hormones. Those -- those are examples.

Q. Do you agree that the Chen study goes up to two years after treatment initiation?

A. Yes.

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Q. Would you characterize two years after treatment initiation as long-term health data?

A. I don't think so.

Q. So Chen would not provide long-term health data?

A. I'll grant that.

Q. Psychotherapy poses no risk to fertility; is that right?

A. Correct.

Q. It poses no risk to ability to attain an orgasm?

A. I wouldn't think so.

Q. Psychotherapy poses no risk to breastfeeding capability?

A. No.

Q. It poses no risk to stature development?

A. No.

Q. It poses no risk to bone density?

A. No.

Q. It poses no risk to heart disease?

A. No.

Q. It poses no risk of blood clots?

A. No.

Q. It poses no risk of stroke?

A. No.

Q. It poses no risk of underdeveloped penile tissue?

A. No.

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Q. Are you aware of any studies showing that psychotherapy without medical interventions does not eliminate gender dysphoria?
A. Sorry, can you say that again?
Q. Sure. Are you aware of any study showing that psychotherapy without medical interventions does not alleviate gender dysphoria?
A. I think -- I'm not sure I can cite a study that's specifically answering that question, but the fact that patients have gender dysphoria despite psychotherapy would presume that conclusion.
Q. So in response to my question, you are not aware of any study showing that psychotherapy without medical interventions does not alleviate gender dysphoria?
A. I'm not aware of a study that takes a group of people with gender dysphoria, exposed them to psychotherapy alone, and then cures all their gender dysphoria, no.
Q. That wasn't my question. My question was, are you aware of any studies showing psychotherapy without medical interventions does not alleviate gender dysphoria?
A. No.
Q. When you started prescribing medical gender transition interventions in your current clinic, was that around 2017?

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A. 2015.
Q. 2015, okay. Sorry, just catching up.
So if we could go back to Exhibit 6, this was one of your articles entitled "Transgender and gender nonconforming adolescent care."
A. 6?
Q. That's right. This is page 2, the second paragraph under "Gender Identity," the second paragraph under "Gender identity."
The second to last sentence says, "Estimates for the likelihood of gender dysphoria persisting from childhood into adulthood range from 2 to 27 percent depending on the study."
You still agree with that statement?
A. I think this is a tricky one. I don't know that I agree with that statement because we're talking about using the term gender dysphoria to describe old studies that were using other definitions of children captured in their studies. So I -- I would agree that that range sounds accurate if you're asking me the percentage of children that express a difference in gender identity during childhood, how many of them are transgender adults, I think that range sounds accurate.
If you're saying how many people -- what

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percentage of people that currently meet the diagnostic criteria for gender dysphoria, I would posit that the percentage is higher.
Q. And by old studies using other definitions, do you mean like the DSM-IV or what are you referring to?
A. So some studies, some of this literature is using DSM-IV, gender identity disorder in childhood criteria. Some of the studies are using referred patients to mental health clinician for gender concerns. So the -- so the denominator is important when you're trying to understand the phenomenon of persisting gender identity. Fortunately, we don't have to make decisions about treatment in prepubertal youth so we can allow puberty to begin and help clarify things for us.
Q. But you agree that using the DSM-IV definition may alter the expected results from what you're seeing today under the DSM-5?
A. Well, I -- I don't know, but I think if we're using the term gender dysphoria to describe people that were diagnosed in a time that that term didn't exist, then we have to be careful.
Q. You're not aware of any updated studies along these lines analyzing persistence from childhood into adulthood using DSM-5 criteria of gender dysphoria?

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A. No.
Q. And you're not aware of any studies examining persistence from adolescents into adulthood using the DSM-5 definition of gender dysphoria, are you?
A. Well, we do have -- have studies examining the percentage of people that discontinue treatment, so I'm not sure if that answers your question.
You would assume that if someone is continuing on treatment they have persistence of their gender dysphoria or their gender identity and the high rate of continuation of treatment suggests a high rate of persistence.
Q. But you don't have any evidence outside of continuing medications in terms of showing persistence from adolescence into adulthood, correct?
A. I can't think of a study specifically asking that question.
Q. And in terms of the literature considering continuing interventions, you're not aware of any of that literature that controls for the use of medical gender transition and establishes the likelihood that adolescent gender dysphoria will persist into adulthood, are you?
MS. WILLIAMS: Objection.
A. I'm sorry, could you repeat that question?

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BY MR. MILLS:
Q. Sure. So you talked about the studies that examined continuation of using the interventions, and my -- my question is, are you aware of any literature that controls for using medical gender transition and establishes the likelihood that adolescent gender dysphoria will persist into adulthood?
A. No.
Q. In your clinic you don't track patients once they hit 18, do you?
A. Many of my patients are older than 18, so I tend to see patients until they're 21 or 22.
Q. You don't track people once they hit 22, then?
A. Patients that graduate from clinic and see adult providers, no.
Q. So you wouldn't know if any of those patients' gender dysphoria persisted past age 22?
A. I wouldn't know the percentage of patients, no.
Q. And most of your patients are on medical transition interventions; is that right?
A. Yes.
Q. And so you wouldn't know how many adolescent patients not on medical interventions would see their gender dysphoria resolve, do you?
A. Not from my own clinical experience. But I would say

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that I have seen many patients with gender dysphoria that for one reason or another were not able to access gender-affirming care and in follow-up those patients tended to have persistence of their gender dysphoria.
Q. Other providers in the United States didn't start this course of treatment for medical gender transition until around -- until after 2006; is that right?
A. I think that most pediatric gender clinics were not in place before that year, that's correct.
Q. You don't know if adolescents with gender dysphoria who do not receive medical interventions are likely to be transgender as adults, do you?
A. Say that one more time, please? Sorry.
Q. Yeah. You don't know if adolescents with gender dysphoria who do not receive medical interventions are likely to be transgender as adults, do you?
A. I do expect that transgender adolescents who do not receive medical interventions will continue to be transgender as adults.
Q. But you have no long-term data supporting that view?
A. Right. I can't point to a specific study taking a group of transgender adolescents that are not being offered treatment tracking them into adulthood, but we do have retrospective data from, for example, the US Transgender Survey exploring, you know, patients that

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currently identify as transgender and their experiences earlier in their life.
Q. So I'm going to show you what I've marked as Exhibit 24, which is an article entitled "Continuation of gender-affirming hormones among transgender adolescents and adults" by Roberts and others.
MARKED FOR IDENTIFICATION:
EXHIBIT 24
2:49 p.m.
BY MR. MILLS:
Q. This was published in the Journal of Clinical Endocrinology and Metabolism, right?
A. Yes.
Q. Are you familiar with this article?
A. I have seen it.
Q. So on page 2 in the second column, the first paragraph just before "methods" the second to last sentence, "In the current study, we assess the rate of treatment discontinuation after starting gender-affirming hormones among TGD adolescents." And then go over to page -- the next page. In the second column in the middle, the third sentence of the first full paragraph, "The four-year" -- oh, sorry, that's not the right sentence.
So there's a link to Figure 3 and then it

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says, "Patients who are younger than 18 years of age." Do you see that on the second column --
A. Yes.
Q. -- on that page?
Okay. And then the next sentence is, "The four-year continuation rate among people who started treatment under 18 years of age was 74.4 percent, and the rate among people who were greater than or equal to 18 years was 64.4 percent."
So this study found that over 25 percent of minor patients had discontinued hormonal therapy after only four years, correct?
A. First I'd just like to point out the sentence that you started to read and then stopped was just explaining that patients who were younger than 18 years of age when starting hormones were less likely to discontinue than patients who were 18 years or older, and I don't dispute the findings of this article.
I think that -- I think the way that the question is framed would suggest that all of the patients that stopped treatment stopped because they had a change in their gender identity, where I don't think that that is accurate that patients stopped treatment for a whole host of potential reasons.
Q. But you would agree that over 25 percent of patients

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in the study under 18 years old stopped --
A. Yes.
Q. -- treatment within four years?
And this study doesn't say what percentage of people may have stopped interventions later, does it, to your knowledge?
A. Later than what?
Q. Beyond four years.
A. No.
Q. Sorry, if you'll just give me one moment.
I'm going to show you an exhibit that I'm marking as Exhibit 25. It's an article that you cite in your report by van der Loos and others, "Continuation of gender-affirming hormones."
MARKED FOR IDENTIFICATION:
EXHIBIT 25
2:53 p.m.
BY MR. MILLS:
Q. Do you recognize this article?
A. Yes.
Q. So if we go to page 872, the E of the first paragraph under "Results" it says, "Overall 282, 59 percent of all 480 eligible, i.e., minimum age of 18 years and at least one year of gender-affirming hormone treatment participants, had gonadectomy."

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So 59 percent of the participants in this study had their sexual organs removed, correct?
A. Yes.
Q. And after that removal, are individuals supposed to continue hormonal therapy?
A. Yes. After gonadectomy, some sex hormone is important for the body's health.
Q. So for 59 percent of these patients, 59 percent of these study participants, they were medically required to continue hormonal therapy, correct?
A. Well, I don't -- I think I'd have to reread the article about how old these people were. I think there's some controversy about how long to continue sex hormones in older people.
This is also in Europe where the rates of gonadectomy are lower in the United States, but, yes, people that generally have gonadectomy benefit from continuing to have sex-hormone exposure in their body usually in the form of testosterone and estrogen replacement therapy.
Q. All right. If we could go back to Exhibit 19, which was part of your book chapters on the duration of pubertal suppression. This is page 76, and I'm under "Endocrine clinical practice guidelines" the second column, and I'm at the bottom of the second paragraph

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under that section.
You say, "There has been limited literature published on treating patients prior to 13.5/14 years of age."
Do you still agree with that statement?
A. Yes. This is referring to gender-affirming hormone treatment.
Q. The next sentence, "Rigorous" -- actually -- oh, so you're talking these the Endocrine Society guidelines. You say, "These guidelines also note that rigorous study and evaluation is needed to determine the effects of prolonged pubertal delay on bones, gonads, and brain development."
Do you agree with the guideline's note on those issues?
A. Yeah, so, I mean, I think we're like quoting me quoting the guidelines, so I guess if you want me to agree to something specific in the guidelines, I'd like to see the guidelines. I agree with this sentence as I wrote it.
Q. So I guess I would say, do you agree that rigorous study and evaluation is needed to determine the effects of prolonged pubertal delay on bones, gonads, and brain development?
A. I think that I would certainly welcome more study on

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long-term outcomes in these areas on long-term pubertal suppression, but given that we do have -- we do have evidence to inform us on how GnRH agonists do interplay with these things and use that to make informed decisions with patients on GnRH agonists use today.
Q. Would you say that evidence is rigorous?
A. Well, I would, for example, say we talked about bone density studies in some detail today, I would call those studies rigorous.
Q. Including the one that found no full catchup by age 22?
A. Right. So that's data that we can now use to discuss with patients the potential risks and benefits of GnRH agonists and determine length of treatment.
Q. So if you go back a page to page 75 here, this is near the bottom of the second column where we're talking about WPATH guidelines, it's right after you say number 1 starting puberty suppression, and two starting sex therapy.
The next sentence is, "Puberty suppressing hormone eligibility may begin as soon as adolescents have the onset of puberty to Tanner stage 2 which they note may occur as early as nine years of age, although it is stated that the evaluation of this approach has

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only been studied for adolescents who are at least 12 years old."

Would you agree that the evaluation of this approach has only been studied for adolescents who are at least 12 years old?

A. No. The -- the original Dutch protocol involved pubertal suppressions at 12 or Tanner stage 2, so that's where that sentence comes from, and I -- I'd have to look at the articles, but I do believe more contemporary research related to GnRH agonists includes folks younger than 12, but I'd have to -- I'd have to look to make sure.

Q. You're not aware of any literature that specifically considers patients who started puberty blockers before age 12?

A. So again, I'd like to look at individual studies to be sure. Like if we're -- if we're -- if we're thinking about, like, the Chen study, for example, the study involved gender-affirming hormones, but many of those children were treated with GnHR agonists prior to starting hormones, and I believe that many of them were younger than age 12. So I don't have -- I don't have a citation off the cuff, but I no longer think that this is accurate, but don't have -- don't have something more definitive to say.

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Q. You mentioned the Dutch studies. Are you saying that some of those children were under the age of 12 when they started puberty blockers in the Dutch protocol?

A. No. I think I was saying that the original Dutch protocol I think as it was worded was using age cutoffs instead of pubertal staging as their primary decision point.

Q. Yeah, got it.

So if you flip over to page 77, the bottom of the first column about three sentences up, "However, the published guidelines offer less nuance and guidance around topics commonly encountered when treating transgender youth. For example, if GnRH agonists are started in early puberty, when should they be discontinued, especially if gonadectomy is not practical or desired."

Do you agree that the current guidelines are still lacking on that question?

A. I think that gender medicine is very nuanced because everyone is an individual with individual goals and needs, so to protocol-ise gender-affirming care is really challenging.

So I agree that, you know, a protocol doesn't contain the nuance of -- of the character of the types of conversations and decisions that

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clinicians face every day, but you use the tenets of the standards of care and clinical practice guidelines in practicing medicine with -- with actual real live people every day, using those tools in your toolkit to understand what is potentially the best next step for each person.

Q. So these -- the guidelines for medical gender transition differ from the guidelines that you would use for something like precocious puberty, correct?

A. I think there's nuance there too because, you know, I think when I'm seeing a patient with precocious puberty, the decision to start treatment is not straightforward. You're balancing things like the importance of height, what the height prediction is, what the parent's heights are, what the social -- social or emotional challenges a young person might face going through precocious puberty, and so, no, a simple protocol to practice medicine doesn't work. That's why doctors are people and not robots.

Q. So the next sentence here is, "What about the large percentage of adolescents seeking medical care well after the onset of puberty or GnRH agonists helpful for these patients?"

You agree that the published guidelines still do not offer much guidance on that question?

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A. I think that's one of the reasons that I wrote this chapter, right, because the -- the -- you know, the Endocrine Society guidelines and WPATH Standards of Care again provide that framework, but then in the real world a patient comes in, you know, after Tanner stage 2 and we have the same conversations like we -- like we had before about what would GnRH agonists do, what wouldn't they do, what are your goals, what's the source of distress, and so, no, I don't think that the guidelines speak to that to the degree that clinicians see it in practice.

Q. And then the next sentence, "If so, should GnRH agonists be considered for adult transgender patients presenting for care?"

And then you say, "While peer-reviewed studies attempting to tackle these questions are sparse, we've attempted to guide the reader through the various situations."

You agree today that peer-reviewed studies on those questions are sparse?

A. Yeah, those specific scenarios I would agree.

Q. And then the last sentence in that paragraph is, "In writing this section, we have relied on personal clinical experience, input from other experts in the field, published clinical guidance, and the limited

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available data on medical treatment and outcomes for transgender individuals."

You still agree that there is limited available data on medical treatment and outcomes for transgender individuals?

A. As I -- as I outlined in my reports, there is literature outlining safety and efficacy and I would not currently categorize that as limited.

Q. So you disagree with what you previously wrote?

A. I would say that today the -- I would not describe the available literature as limited.

Q. So you think in the four years since 2019 the available data has gone from limited to sufficient?

MS. WILLIAMS: Objection.

A. Well, I think -- I think that when I wrote this article and used the word limited, I felt that the literature was sufficient to use these interventions at that time, so I think that the -- the body of literature was sufficient then and now and, no, I would not use the word limited today.

BY MR. MILLS:

Q. Even though you cannot point to any long-term outcome studies that examine any period longer past the age of 22?

A. Since the publication of this article, correct.

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Q. So what is your basis for changing your position?

A. I think it -- I think it has to do with whether -- how we're using the word limited. You know, I think I'm using the word limited in this paper in the -- in the framework of like most authors do in writing a paper calling for more literature on a subject, but not in a way that means limited as in not enough to proceed with care.

Q. The Standards of Care 8 say, "The long-term effects of gender-affirming treatments initiated in adolescence are not fully known."

Do you agree with that statement?

A. Sorry, this is from WPATH Standards of Care 8?

Q. Mm-hmm.

A. Could you read it again?

Q. "The long-term effects of gender-affirming treatments initiated in adolescents are not fully known."

MS. WILLIAMS: I'm sorry. Are you going to be asking him about things from the SOC8?

MR. MILLS: Just about this statement.

A. Okay, so you want me to answer whether I agree with that statement?

BY MR. MILLS:

Q. Mm-hmm.

A. Not fully known, I think that I can support that.

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Q. Okay. Well, I guess we'll look at Standards of Care 8 for a minute.

You're familiar with Standards of Care 8?

A. Yes.

Q. And do you regularly consult it in your practice?

A. I read it enough now that I don't reconsult it, but yes.

Q. I will have that marked as Exhibit 26.

MARKED FOR IDENTIFICATION:
EXHIBIT 26
3:10 p.m.

BY MR. MILLS:

Q. WPATH Standards of Care 8, and this is largely just the adolescent chapter.

If you could flip to page S46, and the first column, the end of that initial paragraph, on the third sentence up from the end of that first paragraph, "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." WPATH wrote this in 2022.

Do you disagree that the number of outcome studies is still low?

A. I think that -- that given the fact that the treatment

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pathway that we've been talking about has only existed since the 1990s naturally up comes data into older adulthood is low.

Q. It also says, "The number of studies is still low."

Do you see that?

A. Yes.

Q. And do you agree with that statement?

A. I think that compared to other areas of medicine, the number of studies is low yet sufficient to endorse the practice -- practice care that -- the care outlined in WPATH's standards.

Q. Earlier you said that between 2019 and 2023 the evidence became no longer limited.

Do you disagree with WPATH that there's a slowly growing body of evidence?

A. No.

Q. The next sentence is, "Therefore, a systematic review regarding outcomes of treatments in adolescence is not possible."

Do you agree with WPATH on that point?

A. I don't know if I would have agreed that a systematic review is not possible at the time of this writing. I -- but I don't have a reason to disagree. I didn't attempt to conduct a systematic review at that time.

Q. So do you believe that a systematic review regarding

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outcomes of treatments in adolescents is possible now?
A. I don't know.
Q. Are you aware of any systematic reviews regarding outcomes of treatments in adolescents?
A. I know that there have been attempts at systematic reviews around various topics in -- in this field, some about pubertal suppression, some about the care in general, yes.
Q. So if we go down a little bit in that column, the second to last sentence it's referring to the de Vries study in 2014.
"The 2014 long-term follow-up study is the only study that followed youth from early adolescence pretreatment mean age of 13.6 through young adulthood posttreatment mean age of 20.7."
Are you aware of any -- first, do you agree that when this was published in 2022 that 2014 study was the only study that had a long-term follow-up?
A. Yes.
Q. And are you aware of any new studies since SOC8 was published that had long-term follow-up?
A. I'm not. I think that the -- the evidence supporting gender-affirming care comes from long-term studies like the ones that we're talking about now, also retrospective data and cohort-type data.

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Q. All right. The WPATH Standards of Care 8 deviates from the Dutch approach used in the de Vries 2014 study because it doesn't prescribe age cutoffs; is that right?
A. Yes.
Q. So the Dutch protocol used age cutoffs at age 16 for cross-sex hormones; is that right?
A. Yes.
Q. And you typically give cross-sex hormones closer to age 14?
A. Who me?
Q. Mm-hmm.
A. Not necessarily. I think that I do have patients that are 14 that have been good candidates for hormones and others that it made more sense to wait until an older age.
Q. So if the Dutch study provides the only long-term outcomes study, there is no long-term study about the use of gender -- medical gender transition that WPATH guidelines prescribe, is there?
A. I'm not sure that there's long-term studies of patients following the -- what is this, 2008?
Q. '22.
A. No, sorry, 2022 model of care, no.
MR. MILLS: All right. This is probably a

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good time for a ten-minute break, if that works for everybody. We can go off.
(Recess taken at 3:16 p.m.)
(On the record at 3:26 p.m.)
BY MR. MILLS:
Q. So, Dr. Shumer, I'm going to show you another clip of Dr. Selkie speaking with you in the presentation we talked about earlier.
(Video played.)
BY MR. MILLS:
Q. Do you agree with Dr. Selkie that there is not as much evidence for medical gender transition as there is for other treatments for children?
A. First I just want to point out that that was like a four-second clip of a -- I don't know what. She said "but" and then it trailed off, so I would be interested to know what she said afterwards. But I would also add that, yes, there are certainly treatments that we use in pediatrics that have been around for decades, and naturally if a modality of treatment has only been around for a couple decades there's going to be less long-term outcomes data on that particular intervention, so clearly that's true.
I'd just like to point out, though, that this is the case with all advances in medicine. When

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a new -- when a new treatment for significant medical condition emerges and there's significantly improved -- significant improvement in whatever condition it is you're treating, then you -- you note that there's not going to be, you know, decades-long outcomes data and use that information when understanding whether this new treatment modality might be beneficial.
Q. So there's less evidence supporting medical gender transition of adolescents than there would be, for example, about protruding precocious puberty?
A. I think those are really difficult to compare because people have been treated for precocious puberty for longer using GnRH agonists. The outcomes that you're measuring for precocious puberty are perhaps simpler to -- to measure; you know, final height, for example, or onset of the first period.
The outcomes that you're attempting to measure when assessing treatments for gender dysphoria are more challenging to measure, quality of life measures, and -- and so I'm not sure if I would agree that there's more articles published about the treatment of precocious puberty.
There's certainly a lot of articles published about transgender medicine, but patients have been treated for longer for that condition for

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sure.
Q. So would you say that the evidence base supporting medical gender transition of adolescents is greater or less than the evidence base supporting treatments of precocious puberty?
A. I don't know.
Q. I'd like to show you one more clip, if I could, from the same presentation.
(Video played.)
BY MR. MILLS:
Q. Do you agree with Dr. Selkie that we don't have good evidence about the long-term risks for young healthy people who start medical gender transition in adolescence?
A. I don't think that's the way I would describe the current state of the literature. I think that we have a lot of knowledge about the long-term effects of having a normal male hormone profile, for example, or normal female hormone profile, for example. We don't have decades-long studies demonstrating that the -- the long-term outcomes for certain health problems are identical to those that are seen in other people with those same hormone profiles, but we also have shorter term research to help demonstrate that we would expect those long-term outcomes data to be reassuring.

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Q. So I guess I'm not clear. Do you agree with her or not that we really don't have good -- good evidence about the long-term risks for young healthy people who start medical gender transition in adolescence?
MS. WILLIAMS: Objection.
A. We certainly don't have longitudinal follow-up studies of patients that had these treatments that are now living in their sixties and seventies. That would be -- that's the type of research that we're developing now, but we do have sufficient literature on the effects of how these medications work and their side effect profile to have meaningful conversations about risks and benefits and prescribe them when appropriate.
BY MR. MILLS:
Q. And you know from studies like the VTE one that we talked about earlier today that the risk profile could vary based on use in transgender individuals, correct?
A. Yes, so we reviewed that I agree, yeah.
Q. So back to Exhibit 19, which is the book chapter we were talking about I think just before SOC8, the duration of pubertal suppression.
A. 19 you said?
Q. That's right. And I'm on page 83, and this is the second column the end of the first full paragraph just

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before the heading that says "Testosterone."
You wrote, "However, prior to the accrual of long-term data, providers should be cautious when starting gender-affirming hormones in early adolescence."
Do you still agree with that statement?
A. Yes. I'm cautious when prescribing hormones in all situations, but especially in early adolescence.
Q. I'd like to show you an exhibit -- let's see where are we -- Exhibit 29, which is an article you wrote, you coauthored, entitled "The role of ascent in the treatment of transgender adolescents."
MARKED FOR IDENTIFICATION:
EXHIBIT 29
3:34 p.m.
BY MR. MILLS:
Q. And I'm on page 5 first full paragraph.
So you say, "There may be clinical situations where patients with carefully diagnosed gender dysphoria who otherwise meet eligibility and readiness criteria are not able to provide meaningful consent due to cognitive or verbal disability. In other medical conditions such as cancer or diabetes, medical interventions would never be withheld from these patients provided parents or guardians are

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available to make proxy medical decisions. This comparison requires acknowledgment that treatment of gender dysphoria with pubertal suppression in cross-sex hormones continues to remain controversial is the subject of continued research and requires careful individualized assessment, whereas the decision to treat of cancer of diabetes with medical interventions is typically not controversial."
You wrote this or you coauthored this article, correct?
A. Yeah. In 2015, yes.
Q. And do you still agree with the passage that I just read?
A. I generally agree, although I would also say that, you know, because gender identity is something expressed by the patient and that diabetes and cancer are more easily measured without the patient's cognitive participation, those are -- that's another difference making decisionmaking around gender dysphoria more complicated than diabetes or cancer.
Q. Sure. But do you also agree that medical gender transition is different from treatment for cancer because of what you say here, it is the subject of continued research?
A. I think both are the subject of continued research.

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Q. So do you no longer agree that medical gender transition is different from treating conditions like cancer or diabetes?
A. I just outlined one reason, one way that it's different. I don't think that they're the same, but being the subject of continued research is not a difference.
Q. Do you think the evidence base for diabetes treatment is greater or less than the evidence base for medical gender transition in adolescents?
A. It depends on what aspect of diabetes treatment.
Q. So you no longer think that the difference in research distinguishes medical interventions for gender dysphoria from cancer or diabetes?
A. I don't think that's what I said.
Q. Well, you said is the subject of continued research makes it different from cancer then. Now you're saying it's no longer different?
A. I'm not saying -- I'm not saying that. So if we read the whole paragraph again, you know, I'm saying that there's -- the point here is that -- that ascent is important in the treatment of transgender youth. Whereas, when youth aren't able to provide ascent in cancer and diabetes, you would still proceed anyway. That wouldn't be advisable in -- in -- in someone with

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gender dysphoria.
Do I think that this area of medicine is controversial? Clearly, because we're meeting here today to talk about it. Do I think that gender medicine is the subject of continued research? Absolutely. There are certain tenets of diabetes care that are better researched than elements of gender dysphoria. You know, new medicines to treat type 2 diabetes in children like Ozempic and Victoza, you know, are just now getting studied.
So we're always learning in medicine and we're always trying to advance care to make patients healthier, but the crux of this paragraph is really just that meaningful ascent is really important in -- when working with gender diverse youth.
Q. You would say there is no difference between the evidence base of your day-to-day treatment of diabetes for patients in your clinic as there is of treatment for your gender dysphoria patients?
MS. WILLIAMS: Objection.
A. I wouldn't say that.
BY MR. MILLS:
Q. Which one would you say is supported by greater evidence?
A. You know, I think -- I think that the question doesn't

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make sense without context. So if you're asking me is there greater evidence that insulin will keep you alive when you have type 1 diabetes or --
Q. Sure.
A. -- should we use GnRH agonists, then, yes, there's more evidence that insulin will keep you alive if you have type 1 diabetes.
Q. And that medicine was used before 2006, correct?
A. Yes.
Q. So you would say the medical gender transition of adolescents is a newer field of medicine than using insulin to treat type 1 diabetes?
A. Yes.
Q. If a patient with type 1 diabetes is unable to provide consent and doesn't want insulin, should the patient still get it?
A. Yes.
Q. Why is that?
A. Because there is a clear cause and effect between getting the insulin and living and -- and -- and so we would figure out a way for that child to get treatment with insulin.
Q. If a patient with gender dysphoria does not want medical interventions, that patient would not receive it, correct?

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A. Correct.
Q. And why is it different?
A. In -- in lots of different ways. There isn't a clear -- in the same way that no insulin equals dying, yes, insulin equals living. The conversation around the potential risks and benefits using treatments for gender dysphoria is much more nuanced and involves consideration of personal values and attitudes on gender, your gender identity, how it's affecting you on a day-to-day, so it's -- it's a more complicated decision that requires patient involvement and input to determine what the best course of treatment is.
Q. And if a patient with gender dysphoria wants medical interventions, that patient would ordinarily receive them?
A. There's certainly situations where a patient may want an intervention, but doesn't meet criteria to receive it, so wanting it by itself is not sufficient.
Q. I'm going to show you what I'm marking as Exhibit 30, which is labeled, "Metaanalysis hormone therapy, mental health, and quality of life among transgender people, a systematic review."
MARKED FOR IDENTIFICATION:
EXHIBIT 30
3:42 p.m.

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BY MR. MILLS:
Q. And this was a systematic review conducted prior to SOC8 funded by WPATH.
Are you familiar with this document?
A. I have seen it, yes.
Q. Okay. So page 1 of the abstract says, "We sought to systematically review the effect of gender-affirming hormone therapy on psychological outcomes among transgender people."
Page 2 under "Search Strategy" it says, "This review is one of a series of systematic reviews conducted for WPATH to inform the 8th revision of the standards of care." If you want to see on page 13, it says funded by WPATH, but it's not important to my questions.
Page 12 the end of the first full paragraph under the "Discussion" it says, "It was impossible to draw conclusions" --
MS. WILLIAMS: I'm sorry, where are you?
MR. MILLS: Page 12 the end of the first full paragraph under "Discussion."
MS. WILLIAMS: After Table 6?
MR. MILLS: That's right.
BY MR. MILLS:
Q. "It was impossible to draw conclusions about the

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effects of hormone therapy on death by suicide."
Do you agree that it's impossible to draw conclusions about the effects of hormone therapy on death by suicide?
A. I don't dispute that the totality of literature isn't adequate in addressing that question. I'd also point out the other finding that wasn't read which demonstrates improvements in quality of life and decrease in depression and anxiety symptoms among transgender people.
So while I think that it is seemingly hard to draw conclusions about death by suicide, the -- the improvements in other areas of mental health are notable and I would -- I would hypothesize that people with improved quality of life, decreased depression and anxiety symptoms are less likely to die by suicide. However, I agree that the literature can't currently answer that question.
Q. So on that other literature the next paragraph begins, "Uncontrolled confounding was a major limitation in this literature. Many studies simultaneously assess different types of gender-affirming care and did not control for gender-affirming surgery status making it difficult to isolate the effects of hormone therapy."
Do you agree that uncontrolled confounding

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is a major limitation in the medical gender transition of minors literature?
A. I think it's a limitation and I think it's important to understand that gender identity care for people, for adolescents specifically, is a challenging thing to measure without any confounding. That, you know, what is confounding? If you have -- if you have a new penicillin and you're comparing it to the old penicillin, you can put a bacteria in a culture dish and put another one in a different culture dish and everything else is the same and just introduce the two penicillins and see which bacteria resolves faster, and there's not a lot of confounding because everything else in that experiment was exactly the same.
But when you're talking about comparing adolescents receiving gender-affirming care in Boston, in LA, in Chicago, and San Francisco, seeing different providers, having different sociopolitical environments, those things can confound results, and this is certainly not unique to gender-affirming care, but a problem with measuring all sorts of different complex care modalities.
Q. So the next paragraph, the third paragraph under "Discussion" says, "Another source of potential bias

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was recruitment of participants from specialized clinics that imposed strict diagnostic criteria as a prerequisite for gender-affirming care. The dual role of clinicians and researchers as both gatekeepers and investigators may force transgender study participants to over- or understate aspects of their mental health in order to access gender-affirming care."
Do you agree that that's another source of potential bias?
A. Potentially. If I was reading any article outlining outcomes of gender-affirming care, I would be interested to know how patients were recruited, what the modality of care was at that institution in order to better understand if the patients in that study were similar to the patients that I treat.
Q. You mentioned a minute ago evidence regarding quality of life, depression and anxiety. If you look at Table 6 on page 13 it lists outcome, quality of life, depression, anxiety, death by suicide as the four outcomes. Under strength of evidence it lists low for qualify for the quality of life, low for depression, low for anxiety, and insufficient for death by suicide. And the footnote E connected to low says, "Evidence downgraded due to study limitations included uncontrolled confounding and imprecision because of

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small sample sizes."
Do you agree that the strength of evidence for quality of life, depression, and anxiety outcomes are all low?
A. So according to the definition as presented, I would. I would also just warn that when you hear something like the strength of evidence is low, that doesn't mean that the evidence is bad or poor or incorrect.
And also just to point out that when you're talking about quality of life, another alternative would be worse quality of life as an outcome. So the fact is that in a systematic review there was findings of improved quality of life for patients that are receiving gender-affirming care categorized as low strength based on the criteria as presented, and I don't disagree with that.
Q. And you would agree low strength of evidence means that -- relative to high strength of evidence, low strength of evidence means that it's more likely that the actual effect is different from what the study found, right?
A. I agree based on the things that we've been talking about. The petri dish example, the only logical conclusion of the difference in clearing the bacteria is that the antibiotic worked better or worse than

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penicillin.
When there's potential confounding in a complex medical problem, the ability to be certain about whether the intervention is the cause of the change is more limited, similarly to the strength of evidence supporting many complex health -- health treatment modalities.
Q. So on page 13 the bottom of the page, the new paragraph that begins at the bottom of the first column of the page, actually specifically the very last sentence in the first column, "Studies assessing the relationship between gender-affirming hormone therapy and mental health outcomes in transgender populations should be prospective or use strong quasiexperimental designs, consistently report type, dose of hormone therapy, adjust for possible confounding by gender-affirming surgery status, control for other variables that may independently influence psychological outcomes, and report results separately by gender identity."
This isn't necessarily describing a randomized controlled trial, correct?
A. Correct.
Q. But it is explaining a higher strength of evidence study design than currently exists, correct?

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A. I think that it's preventing guidance on the type of studies that would be required to strengthen the statements made in this report.
Perhaps I -- perhaps some studies that currently exist meet some of these criteria, but it's, you know, similarly to the end of most scientific articles prescribing next steps to better understand the problem at hand.
Q. But you would agree that at least according to these authors there are study designs short of randomized controlled trials that would be higher quality than the ones they've examined?
A. Yes. For example, the Chen study is a prospective study that was published after this systematic review.
Q. And do you think the Chen study is a high quality study design?
A. I find it to be very helpful to me in my practice because the type of care that's described in the Chen study is similar to the type of care that I practice, and so I would.
Q. And you agreed earlier that the Chen study doesn't have data or conclusions beyond two years from starting cross-sex hormones, right?
A. Correct.
Q. So we can look at the Chen study for a minute. So I'm

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marking the Chen study as Exhibit 31, and you're obviously familiar with it; it's what we've been discussing.
MARKED FOR IDENTIFICATION:
EXHIBIT 31
3:54 p.m.
BY MR. MILLS:
Q. So on page 241, the second page of the article in the middle of the first column at the end of that second paragraph it says, "Evidence has been lacking from longitudinal studies that explore potential mechanisms by which gender-affirming medical care affects gender dysphoria and subsequent well-being."
This -- this study was published in 2023; is that right?
A. Yes.
Q. So would you agree with the authors that in 2023 evidence has been lacking from longitudinal studies that explore potential mechanisms by which gender-affirming medical care affects gender dysphoria and subsequent well-being?
A. There was limited longitudinal studies on this topic prior. I think that was mentioned in the metaanalysis that we just read, and so this is an attempt to expand that literature.

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Q. So on page 242 under the results, this is the second column, it lists that there were 6,114 observations from 315 participants, and it says there were five study visits and 162 participants completed all five study visits.

So about 50 percent completed each of the five study visit questionnaires; is that right?

A. That seems to be what they're saying.

Q. On page 243 in the middle of the second column, three sentences up from the "Appearance Congruence" heading it says, "Two participants died by suicide during the study, one after six months of follow-up and the other after 12 months of follow-up."

So those two individuals could not complete a study visit at 18 or 24 months, right?

A. That's correct.

Q. And two suicides out of 315 participants implies a .6 percent suicide rate; is that right?

A. I don't know. I can do the math with you again. Can you give me those numbers?

Q. It's 2 out of 315, so roughly .6 percent --

A. Okay.

Q. -- does that sound right?

A. Yes.

Q. And that's substantially higher than the adolescent

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suicide rate in the United States generally; is that right?

A. I -- I would be cautious about implying that -- that the -- this represents an actual rate of suicide when you're -- you know, when you're -- if you're using the statistics to say what would be the expected suicide rate if the study were replicated, the -- the range of possible based on the sample size would be quite broad, so I don't think this study is able to say that suicide is more likely as a result of gender-affirming care, but I do agree that .6 percent is higher than the suicide rate in the United States.

Q. So over on page 244 on the table there, Table 1, do you see near the bottom of Table 1 it says, past use of GnRH agonists no was 92.1 percent of participants? So 92.1 percent of the participants had not received puberty blockers; is that right?

A. Yes.

Q. And is that a higher percentage of patients than would not have received puberty blockers in your clinic?

A. As I said, the majority of patients are presenting older than -- than Tanner stage 2. I -- so I think that the percentage of patients that are treated with GnRH agonists is likely higher than the study, but not substantially higher let's say.

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Q. But if they were not treated using the puberty blocker, then is it safe to say that most of these participants went through puberty aligned with their biological sex?

A. Well, we can see exactly how many did based on these numbers.

92 percent of people went through at least some puberty aligned with their biologic sex.

Q. Page 241 the top of the first column, the very first full sentence, "Depression and anxiety symptoms decreased significantly and life satisfaction increased significantly among youth designated female at birth, but not among those designated male at birth."

So biological males saw no improvement in depression, anxiety, or life satisfaction; is that right?

MS. WILLIAMS: Objection.

A. I'm just going to back up for a second to read the beginning of the paragraph.

BY MR. MILLS:

Q. Sure.

A. Okay, I'm with you.

So, yes, during the -- during the course of this study, statistically significant differences in

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depression and anxiety and life satisfaction variables specifically were statistically significantly better in those designated female at birth compared to male at birth, and then the authors continue on to discuss that in more detail.

Q. So in this study, biological males did not see statistically significant improvement in depression, anxiety, or life satisfaction, correct?

A. Yes.

Q. Over on page 247, sorry, 249, the first full sentence on 249 it says, "Finally, our study lacked a comparison group which limits our ability to establish causality."

Do you agree with that statement?

A. Yes.

MARKED FOR IDENTIFICATION:
EXHIBIT 32
4:02 p.m.

BY MR. MILLS:

Q. I'm going to show you what I've marked as Exhibit 32, which I believe you cite in your rebuttal report a commentary by de Vries and others on the Chen paper. This is called "Growing evidence and remaining questions in adolescent transgender care."

On page 276, which is the second page, the

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first column in the middle, and I'm three sentences down from -- let's see. This long paragraph in the middle I'm on the one, two, three, fourth sentence, starts with, "However, other possible determinants of outcomes were not reported, particularly the extent of mental healthcare provided throughout GAH treatment."

So you agree that the Chen study did not control for psychological therapy, correct?

A. Correct.

Q. And it did not control for use of other psychiatric medications?

A. I don't believe so.

Q. So the study cannot exclude the possibilities that psychological therapy or other psychiatric medications could account for any positive change?

A. That's correct.

Q. And the study also does not -- the Chen study also does not control for the fact that testosterone may have mood elevating effects?

A. Right. The reader for this prospective study, just like any prospective study, has to think critically about what the intervention was, what the outcomes are, think about these potential confounders, and then draw conclusions.

Q. So the next sentence, "To date, international

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guidelines for transgender adolescent care recommend a psychosocial assessment and involvement of mental health professionals in a multidisciplinary care model. Whether participating centers in the current study followed that approach is, unfortunately, unclear. Future studies that compare outcomes with different care models are needed preferably using similar results."

Do you agree with that statement?

MS. WILLIAMS: I think it said "similar measures."

MR. MILLS: Oh, I'm sorry, "similar measures," yep.

A. I don't -- I don't know that I agree completely because I'm -- I know the centers that conducted the study, and they are centers that have a psychological assessment and involve mental health professionals in a multidisciplinary care model, so whether it was unclear in the article, it's clear to me that those -- that the clinics that did this, that performed this study meet those criteria.

BY MR. MILLS:

Q. Okay. But you would agree that future studies that compare outcomes with different care models are needed?

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A. Yes.

MARKED FOR IDENTIFICATION:
EXHIBIT 33
4:05 p.m.

BY MR. MILLS:

Q. I'm going to show you what I'm marking as Exhibit 33, which is the protocol submitted for the Chen study.

Are you familiar generally with these types of prestudy protocols?

A. I suppose I am.

Q. Yeah?

A. Yes.

Q. Okay. So page 34, and the pagination skips ahead so it's only on like page 5 or so. The one, two, third sentence says, "The MANOVA analyses will investigate the changes over time in gender dysphoria, depression, anxiety, trauma symptoms, self-injury, suicidality, body esteem, and quality of life."

So the protocol proposes these eight measures to study; is that right?

MS. WILLIAMS: Objection. Do you need to read this or do you need more time to answer?

A. I can answer --

MS. WILLIAMS: Okay.

A. -- that question.

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MS. WILLIAMS: Go ahead.

A. It does.

BY MR. MILLS:

Q. Okay. And flipping to page 43, the table there explains the measure that will be used for each of those -- or the surveys that will be used for each of those measures; is that right?

A. Yes.

Q. So if we go back to the Chen study on page 242, and this is Exhibit 31, and you look at the second paragraph under "measures," at the end of that paragraph it says, "Higher scores on these measures reflect greater appearance congruence, depression, anxiety, positive effect, and life satisfaction respectively."

So this study didn't report on the effects on gender dysphoria, did it?

A. I'm not sure. I'd have to go through and see if that is mentioned or not, but I don't see it in that statement right there.

I think that I -- I think that the -- you know, the implication is that there's -- you know, when a study is trying to measure lots of things, that they may only be publishing the most, you know, positive sounding material.

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You know, in talking to some of the investigators that wrote this paper, I know there was constraints on word limits and such that they certainly would have been happy to present every piece of information, and that information is available, but that the goal of the journal article in the New England Journal of Medicine was to present the most, you know, important or groundbreaking material.

So the fact that every measure isn't documented in this journal article may be true, but also not something that the authors are hiding from.

Q. Did the authors explain to you why they've refused to release the data for these other variables?

A. I don't know anything about releasing or not releasing the data.

Q. That didn't come up in conversation with them?

A. No.

Q. Would you consider it relevant to your treatments whether gender-affirming care helps alleviate gender dysphoria?

A. Yes.

Q. But this study didn't provide any evidence on that measure, did it?

A. Not that I can see right now. It provides evidence based on the outcome measures that we've reviewed.

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Q. They also omitted results going back to those original eight categories on trauma symptoms, self-injury, suicidality, body esteem, and quality of life, correct?

A. Can you point to me where you're at so I can --

Q. Sure. This was in the protocol, those eight --

A. Okay.

Q. -- measures on page 34. Page 34 the middle of the first paragraph, "The analysis will investigate the changes over time for depression, anxiety, trauma symptoms, self-injury, suicidality, body esteem, and quality of life."

A. Okay, yep.

Q. So they omitted results on six of those eight proposed measures, correct?

A. I don't know that to be correct. I would need time to cross-tabulate and -- but certainly not everything that is offered up in this protocol is reproduced in the manuscript.

Q. So the manuscript lists depression, anxiety, appearance and congruence, positive effect, and life satisfaction, so the only -- of the eight on the protocol, only depression and anxiety are among the ones that are actually reported, correct?

A. Unless there's other mentions in other places that we're omitting, that would be correct.

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Q. And to your knowledge, the authors haven't provided this data regarding those variables for public analyzes, have they?

A. I don't have information about that.

Q. You haven't seen the data?

A. No.

Q. The authors would have no reason to hide positive results, would they?

MS. WILLIAMS: Objection.

A. No.

BY MR. MILLS:

Q. It's more likely that they didn't report those measures because they showed negative effects, isn't it?

MS. WILLIAMS: Objection.

A. So by negative effects I think you're implying that perhaps there was a deep diminishment in one of these variables, and I have no -- no reason to believe that there was a diminishment in one of these, and if there was a statistically significant negative outcome, I would expect that that would be published.

BY MR. MILLS:

Q. You expect that would be published in the New England Journal of Medicine?

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A. Yes.

Q. Would you publish it if you found that?

A. What do you mean?

Q. If you conducted this study and found statistically significant negative effects, would you publish that study?

A. Yes.

Q. And you think the New England Journal of Medicine would accept it?

MS. WILLIAMS: Objection.

A. I don't know if it would be accepted.

BY MR. MILLS:

Q. These researchers are all advocates for medical gender transition; is that right?

A. They're providers of gender-affirming care.

Q. And they advocate in their own interests, correct?

MS. WILLIAMS: Objection.

A. I don't know that I would agree with that statement. I don't know all of these individuals, but the ones I do know are doctors that are motivated by the health and wellness of their patients.

BY MR. MILLS:

Q. Would you say they should release the full data of the other measures that they omitted?

A. I don't know that they haven't. I don't have any --

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Q. If they haven't, should they release it?
A. I don't -- I don't have any reason to suggest that they -- that they shouldn't.
Q. So you would agree they should release the data?
A. I think all -- all research conducted is -- that all published research data is typically open access and should be publicly available.
Q. And you think the same of the data that they gathered in this article, the Chen article?
MS. WILLIAMS: Objection.
A. I don't -- I don't know if there's a particular reason that someone would or would not, but yes.
BY MR. MILLS:
Q. I'm going to show you what I'm marking as Exhibit 34, which is an article you cited in your report by Turban and others, "Access to gender-affirming hormones."
MARKED FOR IDENTIFICATION:
EXHIBIT 34
4:15 p.m.
BY MR. MILLS:
Q. You're familiar with this report?
A. Yes.
Q. And it used the 2015 US Transgender Survey as the source of data, correct?
A. Yes.

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Q. And this was an online survey, correct?
A. Yes.
Q. And the participants were drawn from the websites of transgender advocacy organizations, correct?
A. I'm not sure if that's how the websites are described, but the recruitment is pretty well outlined in the US Transgender Survey itself if we wanted to reference it.
Q. So if I were to say it said that the outreach involved developing lists of active transgender LGBTQ and allied organizations who served transgender people, does that sound correct?
A. Yes.
Q. So page 3 of the Turban study under population -- study population, this is near the end of the paragraph, "So this was assessed by choosing hormone therapy in response to the question, "Have you ever wanted any of the healthcare listed for your gender identity or gender transition? Mark all that apply." Options included counseling, therapy, hormone treatment, HRT, puberty blocking hormones, and none of the above."
So this particular study focused on wanting hormones, specifically hormone therapy, right?
A. So this study focuses on desire for and access to

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hormones historically and current mental health, yes.
Q. Okay. The 2015 US Transgender Survey participants are not representative of the actual transgender population in the United States, right?
A. Sorry, say that again.
Q. Yeah. The 2015 US Transgender Survey participants are not representative of the actual transgender population in the United States, correct?
MS. WILLIAMS: Objection.
A. I'm not sure that I would agree with that statement.
BY MR. MILLS:
Q. Okay. I'm going to show you what's marked as Exhibit 35, which is the report of the 2015 US transgender study.
MARKED FOR IDENTIFICATION:
EXHIBIT 35
4:18 p.m.
BY MR. MILLS:
Q. And if we could go to page 26. It jumps around a bit; it's very long.
So 26 just before outreach, the last two sentences, "It is important to note that respondents in this study were not randomly sampled and the actual population characteristics of transgender people in the US are not known. Therefore, it is not

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appropriate to generalize the findings in this study to all transgender people."
Do you agree with that statement?
A. Yes.
Q. And it would necessarily exclude those people who no longer identified as transgender, correct?
A. It would because they wouldn't be responding to the survey as they're not transgender.
Q. And this survey was anonymous, right?
A. Yes.
Q. So researchers would have no way of verifying the self-reported survey responses, correct?
A. That's correct, just like many similar surveys that are used in research.
Q. And individuals who died including by suicide cannot fill out the survey?
A. Individuals who died prior to the survey being available? That's correct.
Q. So they would be excluded?
A. As a transgender person alive during this study period, yes.
Q. If you could flip to page 126 of this transgender survey footnote 12, the second sentence, "While puberty blocking medications are usually used to delay physical changes associated with puberty in youth ages

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4 to 16 prior to beginning hormonal replacement therapy" --
A. Sorry, where are we?
Q. Footnote 12 the second sentence.
MS. WILLIAMS: And I believe it's 9 to 16. You said 4 to 16.
MR. MILLS: I'm losing my eyesight.
BY MR. MILLS:
Q. "While puberty blocking medications are usually used to delay physical changes associated with puberty in youth ages 9 to 16, prior to beginning hormone replacement therapy, a large majority, 73 percent, of respondents who reported having taken puberty blockers in question, 12.9 reported doing so after age 18, in question 12.11."
After age 18 is not when puberty blockers are typically prescribed; is that right?
A. I think it depends on what you mean by puberty blockers. We've been using this word kind of loosely.
So, you know, if the word puberty blockers is the word that's used in the survey question, you know, I think it's worth pointing out that GnRH agonists are the name of the medication that we're talking about when -- when talking about treatment at Tanner stage 2, but other folks may consider other

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medications such as antiandrogens to be puberty blockers, so that's a little bit hard to answer.
Q. GnRH agonists are not typically prescribed after age 18, correct?
A. Not as typically. I think that some trans women are now being prescribed GnRH agonists if they're having trouble with testosterone suppression on estrogen, but more commonly it's used in early adolescence.
Q. So you said you treat people through age 21, 22 and you're familiar with other clinics.
In that age range above age 18, what percentage of your patients would you say are on puberty blockers using either definition of puberty blockers, so including both GnRH agonists and the androgen intercepters?
A. So for trans women older than 18, probably for including both of those, 85 percent, because the majority of patients are on spirolactone and estrogen as an antiandrogen. For trans masculine individuals, a much lower percentage, maybe 20 percent, as testosterone itself is typically sufficient.
Q. So are you surprised that this survey found 73 percent of respondents report having taken puberty blockers after age 18?
A. Again, I think it -- it's all about what patients are

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-- are referring to when they're saying puberty blockers. So do I think that all of the patients that answered a question about puberty blockers actually received GnRH agonists? No, I think that's a lower percentage.
Q. So using this survey to answer questions about GnRH agonists poses a significant risk of bias because of this misunderstanding about puberty blockers?
MR. MILLS: Objection.
A. I think that when you're -- when you're interpreting any study, you know, you have to understand what the survey is asking and what the question being asked is. So when the -- when there's -- when the US Transgender Survey is answering questions about access to gender-affirming care in early adolescence, that in comparing people that didn't have access to that care and showing a difference that's helpful information to understand what access to that care may do for someone's future health.
BY MR. MILLS:
Q. To your knowledge, the survey did not ask whether the participant had gender dysphoria, correct?
A. Not to my knowledge.
Q. So nothing in this survey tracks whether the kids who wanted puberty blockers or cross-sex hormones had

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gender dysphoria, right?
A. There's not any -- there's a retrospective study, so there's no tracking of anything. It's a survey answered at one moment in time.
Q. But you would only prescribe puberty blockers or hormones for gender transition to someone with gender dysphoria, correct?
A. Yes.
Q. So going back to the Turban article on page 12, and again this is Exhibit 34, under "Strengths and Limitations" on page 12, the third sentence says, "Limitations include its non-probability cross-sectional design which produces generalizability and limits determination of causality."
So this study cannot determine causality, right?
A. That's correct.
Q. The next sentence is, "It is possible that people with better mental health status at baseline are more likely to be able to access GAH, thus confounding associations between GAH access and adult mental health outcomes measured."
You agree with that statement?
A. Sorry, I'm trying to find the sentence just to read it along with you.

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Q. Yeah, it's --
A. "It is possible"?
Q. Yeah, "it is possible."
A. I agree that it is possible.
Q. Okay. And then the next sentence says, "Nonetheless, this measure isn't perfect for investigating mental health changes following GAH, and future longitudinal studies are needed."
Do you agree with that statement?
A. I agree that it's imperfect. I think just to point out that between all of the sentences I read were -- were the strengths in this strengths and limitations section that addressed some of those things that we -- that we've discussed.
Q. Toward the bottom, the second to last sentence says, "The 2015 US TS sample is younger with fewer racial minorities, fewer heterosexual participants, and higher educational attainment when compared with probability samples of TGD people in the United States."
Do you agree with that statement?
A. Yes.
Q. And this bias would affect all studies that use this survey; is that right?
A. This -- that's right. When examining data from the US

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Transgender Survey, it's important to understand what the population is surveying, how that population -- who is in that population, and then ask yourself is that population a relevant population to the clinical question that you have.
Q. If we could go back to Exhibit 4, which is your article "Serving Transgender Youth." This is on page 8 of that article, and I'm in the second full paragraph on page 8 the second sentence.
It says, "In general, adolescence is marked by a search for identity and personal transformation and at times impetuous decisionmaking."
Do you still agree with that statement?
A. Yes.
Q. Flipping back to page 6, toward the very last sentence on page 5 over to page 6 -- sorry. On the very bottom of page 5, "In our view, it is often unrealistic to expect an adolescent to sort through the myriad of issues related to gender variance without the help of a professional."
Do you still agree with that statement?
A. Yes.
Q. And you would agree that as a child gets older, the child is more likely to have a better understanding of complex topics like gender identity?

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A. Yes.
Q. And is that one reason why you delay cross-sex hormones?
A. Yes.
Q. I'm going to show you a short clip from your presentation with Dr. Selkie.
MARKED FOR IDENTIFICATION:
EXHIBIT 36
4:31 p.m.
(Video plays.)
BY MR. MILLS:
Q. So do you agree with the Dutch researchers that 10 to 11 is not the ideal age to be making decisions about medical transition?
A. Did the Dutch say that in something you're reading?
Q. Well, that's just how you characterized them in the video.
A. Oh.
Q. But I guess I should just say, do you think that 10 to 11 is the ideal age to be making decisions about medical transition?
A. Not permanent transition which is why we think the -- the leadup to -- that was the leadup to me explaining why we use GnRH agonists instead of using gender-affirming hormones at the start of puberty.

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Q. In fact, the Dutch protocol didn't allow even the use of puberty blockers until the age of 12; is that right?
A. In their first cohort of patients that's what they did, yes.
Q. Do you think 10- to 11-year-olds can weigh the long-term fertility risks associated with medical gender transition?
A. I think that it's possible to talk about fertility in an age appropriate way with a 10-year-old, but there's not -- but there's certainly the -- the ability to -- to discuss complex topics like fertility changes and evolves over time as a child gets older and progresses through adolescence.
Q. So you would agree that a 19-year-old would have a better capability to understand or discuss fertility issues than 10- to 11-year-old?
A. On average, a 19-year-old would certainly be able to discuss fertility in a more complex way than a 10-year-old would.
Q. To go back to -- sorry. That video we can note is Exhibit 35 just so we don't get out of order here.
To go back to Exhibit 1, which was your article --
MS. WILLIAMS: I think that was 36.

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MR. MILLS: Was it? Okay, sorry.
A. Yeah, 35 is the US --
BY MR. MILLS:
Q. Oh, 35 is the US Transgender Survey, got it.
A. So going back to 1?
Q. Yes, No. 1. This is on page 14. This is the first full paragraph sentence number 3 on page 14.
MS. WILLIAMS: Is that the third, "in our experience"?
MR. MILLS: That's right, "in our experience."
MS. WILLIAMS: Are you there?
A. Okay.
BY MR. MILLS:
Q. "In our experience, many adolescent patients, even those who are not transgender, are often reticent to discuss their future fertility. A conversation can be more complex in transgender adolescents who may have some desire to accomplish biologic" -- sorry -- "some desire to have biologic children, but who bristle at the idea of using their own anatomy to accomplish this."
Does that still describe your experience?
A. Yes.
Q. If we could go back to Exhibit 8, which was one of

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your book chapters, the one in Transgender Medicine, and look at page 178. And this is the second sentence on page 178 at the top.
"Transgender youth, especially those presenting prior to or around the onset of puberty, are seldom concerned about the impact of medical interventions on fertility and often even less interested in discussing this topic. This ambivalence is likely age appropriate shared by their cisgender peers and may not predict their future feelings."
Do you still agree with that statement?
A. I do. I think -- I think that the topic of fertility is a tricky one and requires a lot of careful discussion, so I think in all of these passages that we're reading, at least the ones that I wrote, my intention is to express that complexity.
Q. Should medical gender transitions ever be prescribed when a parent or guardian does not consent?
A. Sorry, could you say that one more time?
Q. Sure. Should medical gender transition interventions ever be prescribed when a parent or guardian does not consent?
A. I do not believe so.
Q. You've never prescribed puberty blockers or cross-sex hormones absent a parental consent?

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A. Correct.
Q. And you think others should not as well?
A. I -- I'm a pretty strong advocate for, you know, parental involvement in healthcare decisionmaking when it comes to gender-affirming care, especially in light of the fact that I think oftentimes a child that is engaging in transition without consent of their parents may be unsafe, and if they're financially or emotionally supported by that parent, that, you know, as we've been talking about generalizability this whole time, as you've mentioned the Dutch study and other similar studies involved patients that have psychosocial support, so the literature would support that notion that these interventions are helpful in that context, so I do believe that parental consent is important and would suggest it be obtained when considering initiating gender-affirming care.
Q. If a parent did not consent to insulin for their type 1 diabetic children -- child, would you prescribe it anyway?
A. Yes.
Q. And why -- why the difference?
A. Well, I feel like I answered this question before, but it is a little -- maybe it's a little bit of a different question.

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I think again, you know, insulin is pretty clear. If you have type 1 diabetes, your body doesn't make insulin and you need insulin to live, so there's a clear no insulin and you die, insulin and you live. Whereas, the -- the decision around gender-affirming care there's a lot more nuanced and involves the details related to the patient's experience with their gender, patient and family values, discussion of risks and benefits, decisionmaking that is shared amongst the clinician and the patient and the parent, and so they're very different conditions with very different treatments, and so my answer is different for those two -- for those two different conditions.
Q. I'd like to show you the de Vries 2014 study that we've talked about a couple of times. You're familiar with that study?
A. I guess I have to see it first to know which one you're talking about.
Q. Sure. There are several. This is the 2014 study that earlier we talked about because study path described it as the only long-term follow-up study --
A. Okay.
Q. -- through young adulthood. So this is that study, correct?
A. Yes.

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Q. And we talked about this earlier. The mean age of adult follow-up was 20.7 years old; is that right?
A. Yes.
Q. To your knowledge, is the brain still developing at age 27 years old?
A. Yes.
Q. Would you be interested to know what follow-up looks like past age 20.7?
A. Yes.
Q. Could that affect your treatment decisions?
A. Certainly if all of these patients are doing very poorly now compared to the general population, that would be surprising, and I would like to -- it would be interesting to know that. It's not what I would expect, but to answer your question, yes.
Q. All right. I'd like to show you another paper you wrote that talked about this study. This is Exhibit 38.

MARKED FOR IDENTIFICATION:
EXHIBIT 38
4:41 p.m.

BY MR. MILLS:
Q. This was an article you coauthored with Dr. Spack entitled "Transgender medicine long-term outcomes from the Dutch model."

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On page 2 discussing this study, the second full paragraph on page 2 it starts by saying, "It should be noted that the patients described were well supported, brought to care in early adolescence, and cared for as part of a carefully structured multidisciplinary care team in a small supportive country. Generalizing the Dutch clinics success to clinics in other settings might be problematic."

Do you still agree with that statement?

A. Well, I think we have to remember that when this was written, Dr. Spack had developed the clinic at Boston Children's Hospital modeled after the Dutch clinic and so, therefore, was trying to replicate as closely as possible the -- the Dutch clinic because of this point that we're making in this article, and -- and since 2015, similar clinics around the country are similarly modeled. So, yes, it's something that should be considered, but also the reason why the care is provided the way it is.
Q. So you would still say that generalizing the Dutch clinic's success to clinics that may use other models might be problematic?
A. Like, is there another model that you're -- that you're thinking of? I think most care in the US is performed in this model, so if you're not using a multidisciplinary model of care like the one -- like the care that we've been talking about, then it seems like you wouldn't be following standard of care, perhaps, and may not be generalizable, but also wouldn't be recommended.

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Q. Even this sentence, though, "Brought to care in early adolescence," I think you testified earlier that most of your patients do not present in early adolescence; is that right?
A. That's right. The patients that present to care in our clinic are more -- are better represented in studies like the Chen study.
Q. So the Dutch patient population you would say is different from your patient population?
A. In that way, yes.
Q. This Dutch study, and we can look at the method section on page 697, "Participants include 55 young adults." So you would agree the sample size is 55?
A. Yes.
Q. And there was no controlled group here who did not receive medical interventions; is that right?
A. Well, they are comparing the mental health and quality of life outcomes, I believe, to the general population, so it's a pseudo control group in that way.

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Q. But the general population would not be those adolescents with some gender incongruence?
A. That's correct. There's not a control group of patients with gender incongruence that are not receiving treatment.
Q. Okay. And then it says a little ways down in this third column, "The young adults were invited between 2008 and 2012 when they were at least one year past their GRS," which I believe is the gender reassignment surgery; is that your understanding?
A. Yes.
Q. So the whole sample size of 55 had also received surgeries, correct?
A. At the end time point, yes.
Q. And then it lists further down a couple sentences later, "Nonparticipation was attributed to," and then several things, the last one of which, "One trans female died after her vaginoplasty owing to a postsurgical necrotizing" --
A. Fascitis.
Q. -- "fascitis."

So that would be over 1 percent of the 55 participants died due to gender-affirming interventions?
A. Yes.

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Q. And then it says, "Nonparticipation was N equals 15 out of the 55 who did," and there were 55 who did participate, so over 20 percent of the participants dropped out during the study; is that right?
A. Well, it says here 15 were not one year postsurgical so they didn't meet that criteria.
Q. Mm-hmm.
A. So there's six -- okay, so, sorry, let me try to answer your question again. What was your question?
Q. So of these --
A. So they break it down --
Q. Right. There were 70 people, but 15 of the 70 did not participate because of these various factors; is that right?
A. They weren't included in the --
Q. Analysis.
A. -- analysis, yes.
Q. This -- this death from the -- after the vaginoplasty, are you aware that the death was of consequence of puberty suppression?
A. I don't -- I don't have information to confirm or deny that.
Q. So you don't know if that death was because the patient's penis was too small for the regular vaginoplasty and so surgery had to be attempted with a

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portion of the intestine?
MS. WILLIAMS: Objection.
A. I don't know. I do know that patients that I take care of that are adults that receive surgery at the institution that I work in do not require intestinal tissue for successful surgery. So if this is -- if that was the case, that isn't a complication that I see today.
BY MR. MILLS:
Q. Those patients you're talking about, did they start puberty blockers at Tanner stage 2?
A. Yes.
Q. And you follow every gender-affirming surgery that happens at your hospital?
A. I talk to the surgeon in my institution about patients that are treated at Tanner stage 2, and he has guided me to that he's able to accomplish vaginoplasty successfully despite blockade at Tanner stage 2.
Q. So do you consider him a more adept surgeon than Dr. Bowers?
A. I don't know.
Q. This study didn't control for psychotherapy, did it?
A. No.
Q. And all the subjects were getting psychological counseling during the same time as these medical

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interventions?
A. Yes.
Q. And the bottom of page 697 here, "Participants" -- this is the final paragraph, "Participants were assessed three times posttreatment, during treatment at initiation of cross-sex hormones, and posttreatment one year after gender reassignment surgery."
So this study provides no evidence about the long-term outcomes of puberty blockers and cross-sex hormones without surgeries, correct?
A. Correct. The patients in this study that are included in the final analysis all had surgery.
Q. So flipping over to page 699, the top, that first line in Table 2 UGDS, that's a gender dysphoria scale; is that right?
A. Yes.
Q. And from T0 which was at intake to T1 which was while on puberty supervision, gender dysphoria increased from 53.51 to 54.39; is that right?
A. The mean number is higher. I don't think that they're reporting that to be a statistically significant difference.
Q. They don't report that to be a statistically insignificant difference, though, do they?
A. I do believe they do because the standard deviation

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overlaps, so that is a -- is not a -- is not statistically different.
Q. And is that what a p-test measures?
A. Yes. The p-test is telling us that from T0 to T2 there is a statistically significant difference. There's not a p-value reported for T0 to T1, that's right.
Q. So you don't know whether that p-value would be statistically significant?
A. Well, it's true that I don't know what the p-value is, but if you just look at the numbers, the mean of 53 with a standard deviation of 8, and the mean of 54 with a standard deviation of 7, so that means that those bell-shaped curves would overlap almost completely, and so I am quite confident that those are not statistically significant.
There's not a statistical significant decrease in -- or statistically significant increase in the score from T0 to T1 without pulling out a calculator.
Q. And without a p-value or a calculator, you wouldn't know whether that would be statistically significant?
A. I just explained why it's -- why it isn't.
Q. But putting that aside, the mean for gender dysphoria worsened from T0 to T1; is that right?

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MS. WILLIAMS: Objection.
A. Well, when you're saying worsened, you're implying that there's a meaningful difference in the numbers, and if it's not statistically significant, then -- then I don't -- then it wouldn't be an accurate statement.
So, yes, I don't have a p-value to share with you on those means in standard deviations. Yes, I believe that they are -- that the T1 is not statistically significantly higher than T0. So, no, I wouldn't make an assertion about the difference between those numbers 53.51 and 54.39.
Q. The Dutch protocol excluded those with significant psychological comorbidities, correct?
A. It sounds right. If we wanted to find the place in the methods section where they talk about their inclusion criteria, I can confirm the wording on that.
Q. That's okay. Page 702 the bottom of the first column of text, the last sentence in the first column of 702 says, "These individuals of whom" -- sorry, I'll wait until you get there.
A. 702.
Q. Yeah. "These individuals of whom an even higher percentage than the general population were pursuing higher education seemed different from the transgender

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youth in community samples with high rates of mental health disorders, suicidality and self-harming behavior, and poor access to health services."
Do you agree that -- that the latter community would describe your typical patient population -- sorry, I'll phrase it a different way.
Does your patient population look more like the individuals in the Dutch protocol or what the authors describe as the transgender youth in community samples?
A. Probably somewhere in between because I still think there's a bias towards people with better access to healthcare that are going to receive care at pediatric gender clinics, and the most -- most high risk patients with the least access to mental healthcare, patients living in poverty, or without any parental support, are not being included in the patient population that I see.
Q. So page 700 in the middle it says, "The participants were, other than more likely to be pursuing higher education, families were supportive 80 to 90 percent." The next paragraph. "Many participants reported having never or seldom been called names or harassed. The majority had experienced sexual transitioning as easy."

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Do you think that sample is representative of the patients that are presenting to your clinic?
A. Certainly a percentage of patients that I see are well described by those -- those descriptions, and then others are struggling more than the -- the patients described in this -- in this study.
Q. So I guess I'm asking, you know, are you experiencing patients with these -- who are coming in with these same high levels of positive objective well-being?
A. So I think I'm answering your question when I say that, yes, some patients are very similar to this group of patients and then others are not.
Q. So percentages are you experiencing those type -- the types of patients with high objective well-being to the same high percentages as the Dutch protocol participants were?
A. Perhaps slightly lower percentages, although, again, there is still a bias in terms of who is presenting to gender care because the -- there needs to be some degree of support from family to bring patients to clinic.
Q. I'm going to show you the 2020 article de Vries wrote, which I'll mark as Exhibit 39.
MARKED FOR IDENTIFICATION:
EXHIBIT 39

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4:57 p.m.
BY MR. MILLS:
Q. This is "Challenges in timing puberty suppression for gender nonconforming adolescents."
Are you familiar with this article? I believe it's cited in your report.
A. Yes.
Q. All right. So in the middle of the second column, the second to last sentence in that first paragraph, "This older adolescent group did not only have more mental health difficulties, but also at a later age of onset of gender incongruents."
A. I'm sorry, I didn't pick up where you started. This is the second column --
Q. Second column right under -- right past footnote 4.
A. Okay, I'm there. Thank you.
Q. So she's -- describe --
A. Could you just read it again and ask me the question again? I'm sorry.
Q. Yep, yep, sure. She's describing another study that was written in Pediatrics by Sorbara, et al --
A. Okay.
Q. -- and she's comparing them to the Dutch study. So she says, "Interestingly, this older adolescent group did not only have more mental health difficulties, but

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also a later age of onset of gender incongruents."
A. Okay.
Q. And then skipping to just past footnote 5 on the same column she says, "Authors of case histories and apparent report study warned that gender identity development is diverse and a new developmental pathway is proposed involving youth with postpuberty adolescent onset transgender histories.
"These youths did not yet participate in the early evaluation studies. This raises the question whether the positive outcomes of early medical intervention also applied to adolescents who more recently present in overwhelming large numbers for transgender care."
You would agree that the author of this is the same as one of the authors of the 2014 study we were just talking about?
A. Yes.
Q. And she identifies what she calls "new developmental pathway."
Are most of your patients aligned with this new developmental pathway involving youth with postpuberty adolescent onset transgender histories?
A. So I think that there's a lot of variability in the types of patients that we're seeing. There are

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patients that have seemingly later onset of gender dysphoria than are described in the Dutch paper. There's other patients that had earlier onset of gender dysphoria, but are presenting to care in later adolescence, and then, of course, some patients that are very similar to the patients described in the Dutch article. So on the whole, the average age of presentation is older than the age described in the original Dutch article.
Q. And would you agree with her that this raises the question whether the positive outcome seen in the 2014 study also applied to adolescents who were recently present in overwhelming large numbers for care?
A. I think that that study by itself, you know, would be -- would be best at answering questions related to the younger presenting cohort, and then, you know, other studies examining older adolescents and even adults are -- can be impactful in understanding how later presenting patients may or may not benefit from treatment.
Q. But you aren't aware of a similar long-term outcome study like the 2014 focused on what she calls is the new developmental pathway?
A. Correct.
Q. So the bottom of page 2 the first column of the same

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2020 note we're reading says, "Systematic studies on the rate of adolescents who discontinued their transitions after they have started gender-affirming hormones or surgeries with lasting effects are lacking at present."
Do you agree that there's a lack of systematic evidence about how many adolescent presenting patients de-transition?
A. I -- I think that there is a -- I don't have the citation, but there is a recent article outlining long-term continuation or non-continuation of hormones in -- in adolescents who've started gender -- gender care, but I don't disagree that more systematic follow-up is an important question to continue to study.
MR. MILLS: All right. I think we're almost through. Can we just take a five-minute break? Would that work for everyone?
(Recess taken at 5:03 p.m.)
(On the record at 5:09 p.m.)
BY MR. MILLS:
Q. So I'd like to flip back to the Standards of Care 8, if we could, which was Exhibit 26, and I'm looking at page S51. Yep, you're good.
A. Okay. S51?

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Q. That's right, S51.
A. Okay.
Q. So the first full paragraph, the last two sentences of that first full paragraph in the first column on S51.
A. Okay.
Q. See it here?
A. Yep.
Q. It starts, "There are no studies -- There are no studies of the long-term outcomes of gender-related medical treatments for youth who have not undergone a comprehensive assessment. Treatment of this context, e.g. with limited or no assessment, has no empirical support and, therefore, carries the risk that the decision to start gender-affirming medical interventions may not be in the long term best interests of the young person at that time."
Do you agree with that statement?
A. Yes.
Q. So a provider who prescribes medical gender transition interventions for an adolescent who's never had any mental health evaluation for gender dysphoria, would not be following the WPATH guidelines, correct?
A. So it says a comprehensive assessment, so I just want to be careful that that doesn't necessarily mean that it has to be a certain type of health professional.

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A comprehensive assessment must be performed, in our clinic it is a mental health professional. In most pediatric gender clinics it is, but it needs to be someone that's competent in doing a psychosocial assessment and diagnosing gender dysphoria.

Q. So you think someone can receive medical gender transition interventions consistently with WPATH who's never had a mental health evaluation for gender dysphoria?

MS. WILLIAMS: Objection.

A. So I -- I think in my mind comprehensive assessment is a mental health assessment, so -- but I just wanted to be clear on the words in WPATH, that they use the word comprehensive assessment. I agree that a mental health assessment is important.

BY MR. MILLS:

Q. Okay. I'd like to show you what I'm marking as Exhibit 40, which is an article in the Los Angeles Times entitled, "This abortion doctor is not ready to leave Alabama."

MARKED FOR IDENTIFICATION:
EXHIBIT 40
5:13 p.m.

BY MR. MILLS:

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Q. Have you read this article?

A. No.

Q. So on page 1 it's dated April 2023. You can see in the first two paragraphs of the article it discusses a Dr. Leah Torres, a 43-year-old OB-GYN.

To your knowledge, Dr. Torres is not an endocrinologist, correct?

A. Correct, not to my knowledge.

Q. Or a pediatrician, to your knowledge?

A. No. I don't know her. I had nothing -- no information other than what's here in the article.

Q. Sure. And so you don't know if she has any mental health training?

A. I don't know.

Q. So page 10 of the article in the middle -- actually toward the bottom, the third to last paragraph on page 10, "When meeting trans patients, Torres is upfront that she has been practicing such care for only a year. Full disclosure she tells them this area of medicine is pretty new to me. She also points out that this is a relatively experimental area of medicine without a lot of data."

Just from that description, does that -- does that sound like someone you would consider to be qualified to practice pediatric gender medicine?

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A. I don't think I can take two sentences from a quote and make that determination.

Q. All right. So two paragraphs above what we just read, "Torres does not believe adolescents seeking hormones require mental health evaluations. "No, I don't need a psychologist or psychiatrist to evaluate someone who's telling me this is how I felt for years," she said. "I know that how they felt for years is not pathological.""

In your view, is Dr. Torres providing care in accord with WPATH Standards of Care 8?

MS. WILLIAMS: Objection.

A. So I want to just pick apart these two sentences before I answer.

So a psychologist or psychiatrist is not necessarily required to be the person that does the mental health evaluation, and that her comment that how someone's feeling, their gender identity is not pathological, I would agree with.

Q. Even though it's a DSM-5 diagnosis?

A. Gender dysphoria is -- is a DSM diagnosis, but a difference in gender identity is not. So the author wrote Torres does not believe adolescents seeking hormones require mental health evaluation, but that's not her quote. And so I don't know what evaluation

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Dr. Torres would perform in determining whether someone has unmet mental health needs, but I wouldn't be able to assess that just from these lines in this article.

Q. It doesn't sound like Dr. Torres is performing gender medicine in the context of a multidisciplinary clinic, does it?

MS. WILLIAMS: Objection.

A. I would have a hard time answering that question without more context.

BY MR. MILLS:

Q. Assuming she's the only provider that talks to a patient, is she performing in the context of multidisciplinary care?

A. No.

Q. So she's not performing in accord with WPATH Standards of Care 8, correct?

MS. WILLIAMS: Objection.

A. Well, I don't know how she's actually performing. I -- that second question is unrelated to the previous one.

BY MR. MILLS:

Q. So the article goes on to say that Dr. Torres prescribes youth cross-sex hormones on their first visit, including a visit via telehealth, regardless of

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whether they had a mental health evaluation.
Would you do that in your clinic?
A. Can you direct me to where that's stated?
Q. If you could just answer the question. We don't need to look at the article again.
A. Well, I guess it would be important to know is she talking about an adolescent or an adult. I certainly have prescribed hormone interventions to patients on a first visit, and prescribing on a first visit with the doctor or performing telehealth visits would not be outside of the standard of care, so.
Q. So the next paragraph, the last paragraph on page 10, "One transgender patient Torres recently started seeing through telehealth was referred to her because the teen's pediatrician and staff at a psychiatric hospital did not respect his gender identity and used his own name. He told Torres he had known he was a boy for years. Torres," the next page, "told him straight up that she would prescribe a low dose of testosterone."
Do you believe that Dr. Torres is providing care in accord with WPATH Standards of Care 8?
MS. WILLIAMS: Objection. Counsel, if you're going to ask about the article, he should be able to read the article.

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BY MR. MILLS:
Q. The sections I've described outline how she has cared for this child, and I'm asking the care for this child was that in accord with WPATH Standards of Care 8.
A. I think it's hard for me to comment on what her care actually is like, but, you know, I think that I would suggest that mental health evaluation is important for adolescents with gender dysphoria prior to proceeding with hormone, and that's why I practice the way I do.
Q. So she may be treating a condition that has never been properly diagnosed, correct?
A. I think it's hard to say based on the author's report of her conversation with her, but --
Q. The passages I've read you have no concerns with how Dr. Torres is practicing gender medicine for adolescents?
A. I'd like to reserve concern until I knew more about how she actually structures her visits and sees patients.
Q. The next page, page 11, the second to last paragraph, "I will do whatever I can within legal parameters," Dr. Torres said later."
You would agree that WPATH itself cannot do anything about Dr. Torres's practice of gender medicine?

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A. What? Say that again.
Q. Can WPATH do anything to stop Dr. Torres from using her current approach to gender medicine?
A. I don't know what her current approach is exactly, but WPATH can't tell anyone what to do.
Q. And neither can the Endocrine Society?
A. No.
Q. Should adolescents be able to receive gender-affirming surgeries?
A. I think that there's some adolescents that benefit from masculinizing chest surgery, but I don't advise genital surgeries in patients under 18.
Q. Are you aware that Standards of Care 8 now permit surgeries under age 18, including the bottom surgeries you just mentioned?
A. I think that the WPATH doesn't actually discuss particular age cutoffs and more talks around patient readiness and individual factors.
Q. In fact, is it right to say that WPATH removed the age considerations that were in the initially published version of Standards of Care 8?
A. I believe that to be true.
Q. Do you know why they removed those age restrictions?
A. I do not.
Q. Do you know if it was so that the AAP would not oppose

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the Standards of Care 8?
MS. WILLIAMS: Objection.
A. I do not know.
BY MR. MILLS:
Q. Are you aware that the United States in this case is not challenging the law's ban on surgeries?
A. I was aware.
Q. Should they be?
A. That's not for me to say.
Q. You think it will harm children, though, if they can't access gender-affirming surgeries before the age of 19?
A. Before the age of 19.
Q. That's the age in Alabama.
A. I think it's -- it's possible that it can be harmful, but as a nonsurgeon, I have more experience with the -- the treatment of gender dysphoria with hormonal interventions.
Q. Have you told the United States that they should challenge the surgery component of the Alabama law?
MS. WILLIAMS: Objection.
A. I have not.
BY MR. MILLS:
Q. Why do you think they aren't challenging the surgery component of the law?

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MS. WILLIAMS: Objection.
A. I don't know.
BY MR. MILLS:
Q. I'm going to show you a clip. Do you recall doing a Facebook live streaming video with a group called "Stand with Trans" entitled "Ask the Expert" in February 2021?
A. I do believe so.
Q. Okay. I'm just going to just show a clip from that video if we can get it queued up here.
(Video playing.)
BY MR. MILLS:
Q. And I'll mark that as Exhibit 42 [sic].
MARKED FOR IDENTIFICATION:
EXHIBIT 41
5:24 p.m.
BY MR. MILLS:
Q. So in this -- in this video, you're talking about -- sorry. What types of surgeries are you specifically referring to in this video?
A. I was -- I was talking about OB-GYNs so I was talking about hysterectomy.
Q. Okay. And do you -- so in the video you said it should be an adult decision to completely reverse fertility potential.

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Do you still agree that it should be an adult decision to completely reverse fertility potential?
A. I do. I think that the decision around removal of gonads and therefore having no possibility of fertility is different than the hormonal interventions that we've been discussing so far which do not reduce fertility to zero, and my opinion is that -- that that decision is best made in -- in most people after 18.
Q. And that's -- you have that view despite the potential availability of artificial means of reproduction?
A. As in? What artificial means of reproduction are you referring to, like, sorry, just to understand your question a little better?
Q. Sure. A 17-year-old considering these surgeries could conceivably freeze her eggs, for instance, but despite that available option, you still don't think a person, a child, should be able to decide to have that surgery?
A. I think there could be a compelling case where a person has really significant gender dysphoria related to the uterus, and I'd be open to the idea that the benefits would outweigh the risks, but as a general matter, I -- I -- I encourage people to delay the decision on gonadectomy surgeries.

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Q. And you're a pediatric endocrinologist, correct?
A. Yes.
Q. You don't treat adults past the age of 22, thereabouts?
A. Sometimes I have patients that I have a hard time graduating because they don't want to say good-bye, so some patients are 23 or 24, but generally that's the oldest patients, group of patients that I would see.
Q. And why is pediatric endocrinology its own specialty?
A. I think that there's a wide range of endocrine problems that affect children that don't affect adults and so having a specialty devoted to pediatrics is important.
Q. So treatments may vary between adult and child practice it sounds like?
A. Generally in endocrinology or gender-affirming care?
Q. Generally in endocrinology.
A. Yes.
Q. And research on treatments for adults again generally in endocrinology may not be applicable to treatments for adolescents; is that right?
A. Yes.
Q. All right. I'd like to show you another study that you cited in your report, and this has to do with the -- one of the twin studies that we started talking

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about earlier.
So I will mark this as Exhibit 42.
MARKED FOR IDENTIFICATION:
EXHIBIT 42
5:28 p.m.
BY MR. MILLS:
Q. So again this -- you're familiar with this study? You cited it in your report; is that right?
A. Yes.
Q. If we could go under "Methods" on page 452.
MS. WILLIAMS: You mean 752?
MR. MILLS: Yep, I do. Yes, I do.
BY MR. MILLS:
Q. So it says, "For the review of case studies on twins, we searched several databases using the following keywords. For unpublished data sets we contacted the authors directly. We also included three twin pairs who attended the gender clinic of Ghent University." And then later on it says, "There were some case reports examined at our clinic," and then it says, "A total of 25 twin pairs were also available for analysis from a Toronto gender identity service."
So this isn't a randomized sample, correct?
A. Correct.
Q. And it would not be representative of the overall

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population of twins?
A. Well, that's, I think, open to the readers and open for the readers' determination. So having enough identical twins in one gender clinic there wouldn't be enough power to answer any question about -- about a genetic link so you need to widen the circle, so to speak. So they outlined how they recruited these twin pairs, and then it's for the reader to then assess how well does this recruitment strategy represent twins generally.
Q. And these -- these patients, or some of them, had been diagnosed with gender identity disorder. That is the old diagnosis under the DSM-IV; is that right?
A. Yes.
Q. And that's not the same is gender identity under the DSM-5?
A. There's -- the criteria are not identical.
Q. So this study does not examine twins in the context of the current diagnostic criteria for gender dysphoria under the DSM-5?
A. That's right. It's not -- it's specifically talking about gender identity disorder, which is similar to, but not the same as gender dysphoria.
And I think I also used this article to express biologic origin for gender identity more

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generally, so we're using gender identity disorder as a surrogate for gender identity.
Q. But not all persons with divergent gender identity have or had under the old diagnosis gender identity disorder; is that true?
A. That's true.
Q. So on page 755 under "Statistical Analysis" it says, "If we combine the same sex MZ and DZ twin pairs across sex, there were a total of nine 39.1 percent MZ twin pairs concorded for GID, and fourteen 60.9 percent discorded for GID. Of the 21 DZ twin pairs all were discorded for GID."
So that means, if I can try to translate that, that means that 39.1 percent of identical twins examined were found to both have gender identity disorder; is that a fair --
A. Yeah, I think the way that I would explain it is they're finding twin pairs where at least one of the twins has gender identity disorder, and then they're saying what percentage of the other also has gender identity disorder.
So in the monozygotic or you could say identical twins, 39 percent of the other twin also had gender dysphoria, and the fraternal, so to speak, dizygotic twin pairs none of the other twins had

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gender identity disorder.
Q. Right. You said gender dysphoria, but it's really just gender identity disorder?
A. Right, that's what I tried to say, yep.
Q. Okay. So 755 on the second column right at the top of the page, the higher concordance for GID and MZ than in DZ twins is consistent with a genetic influence on its genesis, although shared and nonshared environmental factors cannot be ruled out."
Do you agree with that statement?
A. Yes.
Q. Then the next sentence, "Indeed, from these case reports, very little is known about the "equal environment assumption." That is the assumption that MZ twins are not treated more similarly than DZ twins in ways that might affect their gender identity."
You agree with that statement?
A. I think I understand what they're saying, and in -- I would agree that the -- the point they're making is, you know, the assumption in twin studies is that the environment is the same when you are an identical twin or a fraternal twin because you're living in the same house, but could there be subtle differences in the environment if you are identical twins, are you treated differently in some way that isn't the case

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with fraternal twins, could this be explaining the reason that 39 percent of monozygotic twins are concorded where zero percent of dizygotic twins are concordant, that's the question that they're posing, so it's up to the reader then to think that through and make a determination.
Q. And so under "Statistical Analysis" on 755 the first column the second sentence, the one right after the one we already read was, "The difference in concordance between the MZ and DZ pairs was significant chi squared equals 8.18, so" --
MS. WILLIAMS: It says 8.08.
MR. MILLS: Sorry.
MS. WILLIAMS: That's okay.
MR. MILLS: I'm dying, 8.08.
BY MR. MILLS:
Q. So this chi squared test just asks whether there's an observed difference between two variables; is that right?
A. Yes.
Q. And it doesn't control for any other variables, correct?
A. Right. But again, that's sort of the point of a twin study is that you're doing almost everything you can to control the variables.

Q. But the -- in terms of formal statistical analysis, it doesn't control for any other variables?
A. Correct.
Q. And so it doesn't control for sexual orientation, right?
A. Correct.
Q. So if there were an overlap between sexual orientation and GID, that could account for some or all of any of this difference observed?
A. I don't really know that I understand what you mean. I think that -- could you explain the question a little bit more?
Q. Sure. So we can look at 755 at the bottom of the page, the very last full sentence. "In all the cases reported to be concorded for GID, there was also concordance for sexual orientation."

So if there's a relation between GID and sexual orientation, any differences between the identical and fraternal twin groups could be due to the sexual orientation concordance rather than gender identity disorder concordance, right?

MS. WILLIAMS: Counsel, we're at 7 according to Coty's clock, but if you want to answer that question.

A. Yeah, so I think what you're saying is -- is that all

of the twin pairs that are concordant also shared the same sexual orientation, so could the sexual orientation be somehow impacting the diagnosis of gender identity disorder.

I think that -- that -- that doesn't seem plausible to me, but I'm not sure I completely understand the question, but I -- I -- I think that regardless of someone's sexual orientation, whether they have a difference in gender identity or have gender identity disorder is -- is relevant, so I guess that would be my answer, but I'm still not sure I hit it out of the park because I'm not sure I understood the question completely.

MR. MILLS: That's all right. Great. Well, thanks so much for your time.

COURT REPORTER: Please put your order on the record for transcript. Do you want to order the transcript?

MR. MILLS: Yes, I would like to order the transcript.

MS. WILLIAMS: United States would as well.

(Deposition concluded at 5:39 p.m.

Signature of the witness was requested.)

Boe, Brianna, Et Al. v. Marshall, Steven T., Et Al.
Daniel Shumer, MD (#6502246)

ACKNOWLEDGEMENT OF DEPONENT

I, Daniel Shumer, MD , do hereby declare that I have read the foregoing transcript, I have made any corrections, additions, or changes I deemed necessary as noted above to be appended hereto, and that the same is a true, correct and complete transcript of the testimony given by me.

_____ _____
Daniel Shumer, MD Date
*If notary is required

SUBSCRIBED AND SWORN TO BEFORE ME THIS _____ DAY OF _____, 20___.

_____
NOTARY PUBLIC

Boe, Brianna, Et Al. v. Marshall, Steven T., Et Al.
Daniel Shumer, MD (#6502246)

E R R A T A S H E E T

PAGE_____ LINE_____ CHANGE_____
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_____ _____
Daniel Shumer, MD Date

CERTIFICATE OF NOTARY

STATE OF MICHIGAN)
) SS
COUNTY OF MONROE)

I, LEISA PASTOR, certify that this deposition was taken before me on the date hereinbefore set forth; that the foregoing questions and answers were recorded by me stenographically and reduced to computer transcription; that this is a true, full and correct transcript of my stenographic notes so taken; and that I am not related to, nor of counsel to, either party nor interested in the event of this cause.

LEISA PASTOR, CSR-3500, CRR,
Notary Public,
Monroe County, Michigan
My Commission expires: 9/7/27

Renee Williams
renee.williams3@usdoj.gov
April 22, 2024
RE: Boe, Brianna, Et Al. v. Marshall, Steven T., Et Al.
4/2/2024, Daniel Shumer, MD (#6502246)

The above-referenced transcript is available for review.

Within the applicable timeframe, the witness should read the testimony to verify its accuracy. If there are any changes, the witness should note those with the reason, on the attached Errata Sheet.

The witness should sign the Acknowledgment of Deponent and Errata and return to the deposing attorney. Copies should be sent to all counsel, and to Veritext at cs-southeast@veritext.com.

Return completed errata within 30 days from receipt of testimony.

If the witness fails to do so within the time allotted, the transcript may be used as if signed.

Yours,
Veritext Legal Solutions

Boe, Brianna, Et Al. v. Marshall, Steven T., Et Al.

Daniel Shumer, MD (#6502246)

ACKNOWLEDGEMENT OF DEPONENT

I, Daniel Shumer, MD , do hereby declare that I have read the foregoing transcript, I have made any corrections, additions, or changes I deemed necessary as noted above to be appended hereto, and that the same is a true, correct and complete transcript of the testimony given by me.

5/15/2024

Daniel Shumer, MD Date

*If notary is required

SUBSCRIBED AND SWORN TO BEFORE ME THIS 15th DAY OF May, 2024.

NOTARY PUBLIC

KENNARD LEE VANCAMP III
Notary Public - State of Michigan
County of Washtenaw
My Commission Expires Sep 19, 2030
Acting in the County of Washtenaw

KENNARD LEE VANCAMP III NOTARY PUBLIC MY COMMISSION EXPIRES SEP 19, 2030 County of Washtenaw STATE OF MICHIGAN

Boe, Brianna, Et Al. v. Marshall, Steven T., Et Al.

Daniel Shumer, MD (#6502246)

E R R A T A S H E E T

PAGE_23_ LINE_13__ CHANGE_"gains" to "genes"_____

_____

REASON_wrong word_____

PAGE_35__ LINE_14__ CHANGE_"children in adolescence" to "children and adolescents"_____

REASON_wrong word_____

PAGE_36__ LINE_16__ CHANGE_"cross X hormones" to__ "cross sex hormones"_____

REASON_wrong word_____

PAGE_37__ LINE_21__ CHANGE_"diagnosis" to_____ "diagnose"_____

REASON_wrong word_____

PAGE_41__ LINE_23-24 CHANGE_"half progresses" to__ "has progressed"_____

REASON_wrong word_____

Please see page 273a for continuation of the Errata Sheet.

_____ 5/15/2024

Daniel Shumer, MD Date

Page 273a
Errata Sheet – Continued

PAGE: 45 LINE: 10-12
CHANGE: add open quotation mark before "appear" and add close quotation mark after "environment"
REASON: I am reading a passage, not using my own words

PAGE: 54 LINE: 3
CHANGE: "Casey" to "K.C."
REASON: Corrected name of legal case

PAGE: 61 LINE: 21
CHANGE: "higher" to "high"
REASON: wrong word

PAGE: 63 LINE: 7
CHANGE: "parents" to "patients"
REASON: wrong word

PAGE: 65 LINE: 1
CHANGE: "female body" to "female-bodied"
REASON: wrong word

PAGE: 70 LINE: 9
CHANGE: "persistent" to "persistence"
REASON: wrong word

PAGE: 83 LINE: 5
CHANGE: "involved" to "evolved"
REASON: wrong word

PAGE: 97 LINE: 2
CHANGE: "male body" to "male-bodied"
REASON: wrong word

PAGE: 98 LINE: 1-2
CHANGE: "female body" to "female-bodied"
REASON: wrong word

PAGE: 103 LINE: 3
CHANGE: "the" to "a"
REASON: wrong word

Daniel Shumer, MD

5/15/2024
Date

Page 273b
Errata Sheet – Continued

PAGE: 107 LINE: 24
CHANGE: "a course being estrogen" to "of course being on estrogen"
REASON: wrong words

PAGE: 117 LINE: 12
CHANGE: "adults" to "adolescents"
REASON: I went back to the source material to confirm that the wrong word was transcribed

PAGE: 117 LINE: 15
CHANGE: "e-scores" to "z-scores"
REASON: wrong scientific word

PAGE: 130 LINE: 16
CHANGE: "doctrine care" to "Doctoring: care"
REASON: wrong title

PAGE: 143 LINE: 25
CHANGE: "particularly synthetic ethanol, estradiol," to particularly synthetic ethinyl estradiol,"
REASON: wrong scientific word and position of punctuation

PAGE: 151 LINE: 25
CHANGE: "at a similar stage 2" to "at SMR stage 2"
REASON: I went back to the source material to confirm correct words, SMR is a medical abbreviation for Sexual Maturity Rating

PAGE: 162 LINE: 6
CHANGE: "fought puberty" to "block puberty"
REASON: I went back to the source material to confirm the correct word

PAGE: 164 LINE: 23
CHANGE: "Top ten" to "Top trans"
REASON: I went back to the article in question to confirm correct title

PAGE 165: LINE: 12
CHANGE: "the clinical name Deniliquin the first visible" to "the clinical name of the moment when the first visible"
REASON: wrong word, misssing words; I went back to the source material to find the correct language

Daniel Shumer, MD

5/15/2024
Date

Page 273c
Errata Sheet – Continued

PAGE: 168 LINE: 3
CHANGE: "You say 'After a while'" to "You say after, 'While,' you say,"
REASON: Wrong phrase, the quotation in question starts with the word "while"

PAGE: 182 LINE: 20
CHANGE: "GnHR" to "GnRH"
REASON: wrong scientific word

PAGE: 183 LINE: 21
CHANGE: "protocol-ise" to "protocolize"
REASON: protocolize is a word

PAGE: 189 LINE: 2
CHANGE: "up comes" to "outcomes"
REASON: wrong word

PAGE: 193 LINE: 10
CHANGE: "protruding" to "treating"
REASON: wrong word

PAGE 198: LINE: 21
CHANGE: "ascent" to "assent"
REASON: wrong word

PAGE: 198 LINE: 23
CHANGE: "ascent" to "assent"
REASON: wrong word

PAGE: 199 LINE: 14
CHANGE: "ascent" to "assent"
REASON: wrong word

PAGE: 201 LINE: 4-5
CHANGE: "no insulin equals dying, yes, insulin equals living" to "no-insulin equals dying; yes-insulin equals living."
REASON: more clear with edited punctuation

PAGE: 208 LINE: 1
CHANGE: "preventing" to "presenting"
REASON: wrong word

Daniel Shumer, MD

5/15/2024
Date

Page 273d
Errata Sheet – Continued

PAGE: 212 LINE: 9
CHANGE: "page 241" to "page 247"
REASON: In review of the source material, the page number related to the discussion is wrong

PAGE: 220 LINE: 18
CHANGE: "deep diminishment" to "diminishment" (omit the word deep)
REASON: I don't believe I used the word "deep" because that doesn't make sense; perhaps the transcript caught a stutter, di- diminishment?

PAGE: 228 LINE: 9
CHANGE: "Mr. Mills" to "Ms. Williams"
REASON: The wrong lawyer is quoted, it should be Ms. Williams objecting to the question posed by Mr. Mills.

PAGE: 229 LINE: 13
CHANGE: "produces" to "reduces"
REASON: wrong word

PAGE: 238 LINE: 5
CHANGE: "27" to "20.7"
REASON: wrong number

PAGE: 269 LINE: 3
CHANGE: "concorded" to "concordant"
REASON: wrong word

Daniel Shumer, MD

5/15/2024
Date