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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF ARIZONA

Jane Doe, *et al.*,

Plaintiffs,

v.

Thomas C. Horne, in his official capacity as State Superintendent of Public Instruction, *et al.*,

Defendants,

and

Warren Petersen, President of the Arizona State Senate; Steve Montenegro, Speaker of the Arizona House of Representatives,

Intervenor-Defendants.

Case No. 4:23-cv-00185-JGZ

Motion to Exclude Expert Testimony and Reports of Dr. Daniel Shumer

INTRODUCTION

President of the Arizona State Senate Warren Petersen and Speaker of the Arizona House of Representatives Steve Montenegro respectfully move this Court to exclude the expert testimony and reports of Plaintiffs' expert Dr. Daniel Shumer. Dr. Shumer's opinions are not reliable because he plagiarized them, he lacks the qualifications to offer them, and he has presented no objective proof that his opinions represent good science.

Dr. Shumer plagiarized the majority of the substantive paragraphs in his report. His report contains language that is identical or virtually identical to earlier-filed reports by two experts in unrelated litigation. Despite his extensive plagiarism, Dr. Shumer attempted to conceal his plagiarism through inaccurate testimony. Dr. Shumer repeatedly testified that the words in his report were his own. Although he had not cited either expert report that he plagiarized, Dr. Shumer testified that he had cited all the sources he relied on for his opinions. Dr. Shumer even denied reviewing the other expert reports. And when asked point-blank whether he had plagiarized the other experts, Dr. Shumer initially denied it.

But after he was confronted with the blatant examples, Dr. Shumer admitted that he had committed plagiarism under his university's definition, if that definition applied in this case. Dr. Shumer also admitted that it was a mistake not to cite the other experts.

Courts around the country have excluded experts who plagiarized other experts and, like Dr. Shumer, testified otherwise under oath. Like the experts in those cases, Dr. Shumer should be excluded because of his plagiarism and his attempt to conceal it through inaccurate testimony.

In addition to his plagiarism, Dr. Shumer's opinions are not reliable because he does not have the education, experience, or other necessary qualifications to offer sports opinions. Many of Dr. Shumer's opinions do not contain any support, such as peer-reviewed journal articles or independent research. In fact, only one paragraph in Dr. Shumer's sports opinions contains a citation, and it is to a single journal article that does not support all the propositions that Dr. Shumer claims. This is insufficient and unreliable.

Dr. Shumer should be excluded from this case.

BACKGROUND

Dr. Shumer is a key witness for transgender plaintiffs challenging State laws and Presidential executive orders. Dr. Shumer estimates that he has served as an expert witness in "about 15" cases around the country. Deposition of Daniel Shumer, M.D., Feb. 18, 2025, attached as Exhibit 1, 22:20-23. Dr. Shumer has never testified in support of a law or policy on transgender issues. *Id.* at 37:14-17. Instead, Dr. Shumer has opposed laws in more than a dozen States: Alabama, Arizona, Florida, Georgia, Indiana, Kentucky, Missouri, New Hampshire, North Carolina, North Dakota, South Carolina, Texas, and Utah. *Id.* at 24:14-33:8, 39:16-41:16, 247:4-16; Expert Report of Dr. Daniel Shumer, M.D., MPH, attached as Exhibit 2, ¶ 14; *see also* footnote 1, *infra*. During the previous presidential administration, Dr. Shumer served as an expert witness for the Department of Justice in litigation against Alabama. Ex. 1, 30:9-17. Now, in at least two pending cases, Dr. Shumer is an expert witness against President Trump's executive order protecting children from chemical and surgical mutilation. *Id.* at 245:17-246:20; *see Washington v. Trump*, No. 2:25-cv-00244 (W.D. Wash. Feb. 7, 2025), ECF No. 19; *PFLAG, Inc. v. Trump*, No. 8:25-cv-00337 (D. Md. Feb. 18, 2025), ECF 69-50.

Dr. Shumer has been paid handsomely for his work. Over the past 4-5 years, Dr. Shumer has received about $150,000 for his testimony against State laws protecting children. Ex. 1, 23:8-11.

Dr. Shumer plagiarized his opinions.

At least 22 times found in 19 paragraphs of his expert report, Dr. Shumer plagiarized the reports of two experts not involved in this litigation, Dr. Stephen Rosenthal and Dr. Joshua Safer. *Id.* at 203:24-232:5. Shockingly, Dr. Shumer plagiarized the majority of the substantive paragraphs in his report. *See id.* (identifying plagiarism in 19 of Dr. Shumer's 34 paragraphs after the "Qualifications and Experience" section, including Ex. 2, ¶¶ 16, 18, 19, 20, 21, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 36, 37, 47).

Dr. Shumer's plagiarism is evident by comparing his report (Ex. 2) with the reports of Dr. Rosenthal (attached as Exhibit 3) and Dr. Safer (attached as Exhibit 4).

Dr. Rosenthal's April 19, 2022 Declaration (publicly filed April 21, 2022) (Ex. 3)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
¶ 22: Any **attempts to "cure" transgender individuals by forcing their gender identity into alignment with their assigned sex are harmful,** dangerous, **and ineffective**. **Those practices have been denounced as unethical by all major professional associations of medical and mental health professionals, such as** WPATH, **the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association**.	¶ 23: **Attempts to "cure" transgender individuals by forcing their gender identity into alignment with their birth sex are harmful and ineffective. Those practices have been** widely **denounced as unethical by all major professional associations of medical and mental health professionals, such as the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association**, among others.
¶ 24: **Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of "gender dysphoria," a serious condition** listed **in** both **the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ("DSM-5") and the World Health Organization's International Classification of Diseases ("ICD-10"),** and has been **recognized** as such for decades.	¶ 26: **Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of gender dysphoria, a serious medical condition recognized in** the **American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ("DSM-5**-TR") **and the World Health Organization's International Classification of Diseases ("ICD-10"),** where it is referred to as "gender incongruence."
¶ 26**: Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression, self-harm, and suicidality.** Spack NP, Edwards-Leeper L, Feldmain HA, et al. Children and adolescents with gender identity disorder referred to a pediatric medical center. *Pediatrics*. 2012; 129(3):418-425. Olson KR, Durwood L, DeMeules M, McLaughlin KA. Mental health of transgender children who are supported in their identities. *Pediatrics*. 2016; 137:1-8.	¶ 26: **Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression,** eating disorders, substance abuse, **self-harm, and suicidality**.
¶ 32: **Undergoing treatment to alleviate gender dysphoria is commonly referred to as** a **transition**. **The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical**	¶ 32: **Undergoing treatment to alleviate gender dysphoria is commonly referred to as transition**. **The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical**

Dr. Rosenthal's April 19, 2022 Declaration (publicly filed April 21, 2022) (Ex. 3)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
transition, including puberty-delaying medication and hormone-replacement therapy; **and (iii)** surgical transition, including **surgeries to alter the appearance and functioning** of **primary- and secondary-sex characteristics**.	**transition, including puberty-suppressing medication** (also sometimes referred to as puberty-blocking medication) **and hormone-replacement therapy**; **and (iii)** for adults, **surgeries to alter the appearance and functioning primary- and secondary-sex characteristics**. Surgery is rarely indicated for transgender minors.

Dr. Safer's January 21, 2022 Report and Declaration (publicly filed April 21, 2022) (Ex. 4)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
¶ 17: **"Gender identity" is the medical term for a person's internal, innate sense of belonging to a particular sex.** *See* Endocrine Society Guidelines, Tbl.1 *and* Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451–2460, Tbl.1.	¶ 16: **"Gender identity" is the medical term for a person's internal, innate sense of belonging to a particular sex.** Everyone has a gender identity.
¶ 20: **Gender roles are behaviors, attitudes, and personality traits that a society (in a given culture and historical period) designates** as **masculine or feminine** and/**or** that society **associates with** or considers typical of the **social role** of **men or women**. *See* Endocrine Society Guidelines Tbl.1. **The convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are** examples of **socially constructed gender roles from a particular culture and historical period.**	¶ 19: **Gender roles are behaviors, attitudes, and personality traits that a particular society considers masculine or feminine, or associates with male or female social roles**. For example, **the convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are socially constructed gender roles from a particular culture and historical period.**
¶ 21**: By contrast,** "**gender identity**" **does not refer to** a set of **socially contingent behaviors, attitudes, or personality traits** that a society designates as masculine or feminine. It **is an internal and** largely **biological phenomenon**.	¶ 20: **By contrast, gender identity is an internal and biologically** influenced **phenomenon**. It **does not refer to socially contingent behaviors, attitudes, or personality traits.**
¶ 49: **By** excluding girls who are transgender based on "**biological sex**," and defining that term **to mean** "**reproductive biology and genetics at birth**," **West Virginia** categorically **prevents girls who are transgender from participating on girls' teams** regardless of whether they are pre-	¶ 47: **By** suggesting sex **to mean** only **biological sex determined at fertilization and revealed in utero or at birth**, **Arizona prevents Plaintiffs from participating on girls' teams** because they are transgender girls. **But the biological driver of average differences in athletic performance**

Dr. Safer's January 21, 2022 Report and Declaration (publicly filed April 21, 2022) (Ex. 4)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
pubertal, receiving puberty blockers, or receiving gender-affirming hormone therapy. **But** based on current research, **the** primary known **biological cause of average differences in athletic performance between nontransgender men as a group and non-transgender women as a group is circulating testosterone—not "reproductive biology and genetics at birth." A person's genetic makeup and** internal and external reproductive **anatomy are not useful indicators of athletic performance** and have not been used in elite competition for decades.	**between men and women is circulating testosterone—not a person's transgender status or their biological sex determined at fertilization and revealed in utero or at birth. A person's genetic makeup and anatomy** at birth alone **are not reliable indicators of athletic performance**.

These are just a few examples of Dr. Shumer's plagiarism. To assist the Court, Exhibit 5 contains a counsel-prepared demonstrative of Dr. Shumer's plagiarism in this case based on Exhibits 2, 3, and 4.

Dr. Shumer admitted that he plagiarized his opinions.

Dr. Shumer's employer, the University of Michigan, defines plagiarism as "the appropriation of another person's ideas, processes, results, or words without giving appropriate credit." Ex. 1, 239:10-14; *see also* U-M Standard Practice Guide, *Procedures for Investigating Allegations of Misconduct in the Pursuit of Scholarship and Research under SPG 303.03*, B.3, attached as Exhibit 6. After being confronted with his pervasive plagiarism, Dr. Shumer admitted that "it's clear that some of the words I used were used from other sources without appropriate credit and that that meets [the University of Michigan's] definition." Ex. 1, 240:21-24. Dr. Shumer questioned whether the University of Michigan policy applied to his expert report—which is irrelevant to the definition of plagiarism—but he conceded that his actions satisfied the definition. *Id.* at 240:14-241:1. For that matter, Dr. Shumer's own definition of plagiarism—"using other people's work without incorporating your own thoughts into it," *id.* at 202:19-23—also would apply to the paragraphs he took from the reports of Dr. Rosenthal and Dr. Safer.

After being confronted with his pervasive plagiarism, Dr. Shumer repeatedly admitted that he should have cited the other expert reports. *Id.* at 234:1-13, 235:10-11, 235:25-236:1. He ultimately recognized that it was a mistake to not do so. *Id.* at 234:11-13.

Dr. Shumer's plagiarism does not appear to be confined to this case.

A cursory review of Dr. Shumer's expert reports in other cases indicates that this case is not the first time that he has used plagiarized material. For example, paragraphs substantially similar to those that Dr. Shumer plagiarized in this litigation have been located in his declarations and reports in a dozen other federal cases.[1] This means that plagiarism questions surround every federal case disclosed by Dr. Shumer, and some that he did not disclose, in which he has participated since Dr. Rosenthal and Dr. Safer issued their expert reports. These cases include challenges to other State laws as well as President Trump's executive orders.

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[1] Expert Declaration of Daniel Shumer, M.D., *PFLAG, Inc. v. Trump*, No. 8:25-cv-337 (D. Md. Feb. 18, 2025), ECF No. 69-50, ¶¶ 27-29, 31, 38, 46, 48, 52, 55, 59; Expert Declaration of Daniel Shumer, MD, *Washington v. Trump*, No. 2:25-cv-244 (W.D. Wash. Feb. 7, 2025), ECF No. 19, ¶¶ 27-29, 31, 38, 46, 48, 52, 55, 59; Expert Report of Daniel Shumer, M.D., *Voe v. Mansfield*, No. 1:23-cv-864 (M.D.N.C. Oct. 10, 2024), ECF No. 138-19, ¶¶ 27-29, 31, 37, 45, 47, 50, 53, 58; Expert Declaration of Daniel Shumer, M.D., *Misanin v. Wilson*, No. 2:24-cv-4734 (D.S.C. Aug. 30, 2024), ECF No. 7-4, ¶¶ 25-27, 35, 39, 43, 46, 50, 55, 58; Declaration of Daniel Shumer, M.D. in Support of Plaintiffs' Motions for Preliminary Injunction and Plaintiff Parker Tirrell's Motion for Temporary Restraining Order, *Tirrell v. Edelblut*, No. 1:24-cv-251 (D.N.H. Aug. 16, 2024), ECF No. 7-6, ¶¶ 14, 16-17, 19, 21, 23-27, 29-30; Plaintiff-Intervenor United States' Disclosure of Expert Testimony of Daniel Shumer, MD, MPH, *Boe v. Marshall*, No. 2:22-cv-184 (M.D. Ala. June 24, 2024), ECF No. 592-14, ¶¶ I.2-5, III.1, IV.1, IV.3, IV.5-6, IV.9; Expert Report of Dr. Daniel Shumer, MD, MPH, *Roe v. Cunico*, No. 4:20-cv-484 (D. Ariz. Nov. 17, 2023), ECF No. 233-2, ¶¶ 18, 22, 24-34; Declaration of Daniel Shumer, M.D., *Koe v. Noggle*, No. 1:23-cv-2904 (N.D. Ga. June 29, 2023), ECF No. 2-8, ¶¶ 24-27, 37, 42, 46, 49, 53, 59; Declaration of Daniel Shumer, M.D., *Doe v. Thornbury*, No. 3:23-cv-230 (W.D. Ky. May 22, 2023), ECF No. 17-1, ¶¶ 25-27, 35, 39, 43, 46, 50, 56; Expert Declaration of Daniel Shumer, M.D., *Doe v. Ladapo*, No. 4:23-cv-114 (N.D. Fla. Apr. 24, 2023), ECF No. 30-4, ¶¶ 24-27, 35, 39, 43, 46, 50, 56; Expert Declaration of Daniel Shumer, M.D., *K.C. v. The Individual Members of the Med. Licensing Bd. of Indiana*, No. 1:23-cv-595 (S.D. Ind. Apr. 21, 2023), ECF No. 26-2, ¶¶ 26-28, 30, 35, 43, 44, 49; Expert Report of Daniel Shumer, M.D., *Dekker v. Weida*, No. 4:22-cv-325 (N.D. Fla. Apr. 7, 2023), ECF No. 120-22, ¶¶ 25-28, 36, 41, 45, 48, 52, 57. These declarations and reports also may contain other instances of plagiarism in addition to the paragraphs identified in this case.

ARGUMENT

The district court has a "gatekeeping role" that it must apply to all expert testimony. *United States v. Valencia-Lopez*, 971 F.3d 891, 898 (9th Cir. 2020). Under the Federal Rules of Evidence and *Daubert*, expert testimony must be both relevant and reliable. *Guidroz-Brault v. Missouri Pac. R. Co.*, 254 F.3d 825, 829 (9th Cir. 2001). The key is whether "the expert's findings are based on sound science." *Daubert v. Merrell Dow Pharm., Inc.*, 43 F.3d 1311, 1316 (9th Cir. 1995).

Even in a bench trial, the court must still "exclude . . . or disregard" expert testimony "if it turns out not to meet the standard of reliability established by Rule 702." *United States v. Flores*, 901 F.3d 1150, 1165 (9th Cir. 2018) (quotations omitted). Furthermore, "the *Daubert* standard can be invoked at the summary judgment stage" and can often "be dispositive" or "at the very least, . . . limit the issues for trial." *Nixon-Egli Equip. Co. v. John A. Alexander Co.*, 949 F. Supp. 1435, 1447 (C.D. Cal. 1996). In this case, Dr. Shumer's proposed testimony is not reliable because he plagiarized most of his expert report and otherwise lacks the qualifications and objective support for his opinions.

I. Dr. Shumer should be excluded as unreliable because of his pervasive plagiarism.

Dr. Shumer's extensive plagiarism warrants excluding him as an expert in this case. The Northern District of California excluded an expert's opinions that were "almost entirely copied and pasted" from another expert report. *Snyder v. Bank of Am., N.A.*, No. 15-CV-04228, 2020 WL 6462400, at *4 (N.D. Cal. Nov. 3, 2020) (identifying 11 plagiarized paragraphs). The *Snyder* court found that the plagiarism "emphasizes that Plaintiff lacks expertise in these areas." *Id.*

Here, Dr. Shumer plagiarized at least 19 of the 34 substantive paragraphs in his report. Dr. Shumer admitted that paragraphs in his report contained identical text to reports by Dr. Rosenthal and Dr. Safer. *See* Ex. 1, 204:15-17, 211:19-24, 222:25-223:3, 225:7-8. He also admitted that other paragraphs were virtually identical to the other experts' reports. *Id.* at 205:18-20, 216:22-217:1, 226:2-4, 226:21-25, 227:12-15, 228:18-229:1.

Dr. Shumer plagiarized "a report written by an unrelated expert in a different case." *In re Cathode Ray Tube Antitrust Litig.*, No. 07-CV-05944, 2022 WL 4596621, at *2 (N.D. Cal. Aug. 1, 2022). The Middle District of Florida excluded an expert who "copied and pasted large sections of her report from a report written by . . . an apparel expert whom [the defendant] retained in another trademark case." *Spiral Direct, Inc. v. Basic Sports Apparel, Inc.*, No. 6:15-CV-641, 2017 WL 11457208, at *2 (M.D. Fla. Apr. 13, 2017). Similarly, the Eastern District of Louisiana excluded an expert because "many of his sentences were nearly identical" to another expert. *Moore v. BASF Corp.*, No. CIV.A. 11-1001, 2012 WL 6002831, at *7 (E.D. La. Nov. 30, 2012). Like the excluded experts in *Spiral Direct* and *Moore*, Dr. Shumer plagiarized unrelated experts in different cases pending in West Virginia and Alabama.

Dr. Shumer even plagiarized "his case-specific opinions." *Contrast Thomsen v. NaphCare, Inc.*, No. 3:19-CV-00969-AR, 2023 WL 8701971, at *7 (D. Or. Dec. 15, 2023). Dr. Shumer's opinions on athletic performance and testosterone came from Dr. Safer. *See* Ex. 5 (comparing Shumer ¶¶ 36-37, 47 *with* Safer ¶¶ 25, 49). Dr. Shumer's opinions on gender dysphoria and transition came from Dr. Rosenthal. *See id.* (comparing Shumer ¶¶ 23, 26, 28-34 *with* Rosenthal ¶¶ 22-24, 26-27, 29, 32, 36, 39).

Dr. Shumer's plagiarism should be undisputed. Once confronted with the numerous identical and virtually identical paragraphs, Dr. Shumer initially said that his words were "close enough to plagiarism that I wish I would have cited the materials differently." Ex. 1, 235:25-236:1. He acknowledged that it was a mistake not to cite Dr. Rosenthal or Dr. Safer. *Id.* at 234:11-13. Then when presented with the University of Michigan's definition for plagiarism, Dr. Shumer testified that "it's clear that some of the words [he] used were from other sources without appropriate credit and that that meets this definition." *Id.* at 240:21-24.

Dr. Shumer should be excluded because of his pervasive plagiarism of other experts, including plagiarism of his case-specific opinions. This is even more true considering the possible plagiarism in at least 12 other cases. Dr. Shumer is not a reliable expert witness.

II. Dr. Shumer should be excluded as unreliable because of his attempts to conceal his pervasive plagiarism.

"An expert's attempt to conceal plagiarism may also undercut his reliability." *Thomsen*, 2023 WL 8701971, at *6. Dr. Shumer should be excluded because he covered up his plagiarism until confronted at his deposition.

First, Dr. Shumer testified that his report contained his words. He claimed that the words in the report were his. Ex. 1, 13:2-6, 59:5-7. He testified that he took sources identified in his report and distilled them into his own words. *Id.* at 114:12-22, 115:5-16. He explained that his "Sports and Gender" opinions "came from me thinking about the -- the question at hand and providing my expert opinion." *Id.* at 14:12-13.

In a case involving another plagiarizing expert, the Eastern District of Louisiana excluded an expert after finding it "particularly problematic" that the expert "testified that the report he [proffered] was his original drafting . . . ." *Moore*, 2012 WL 6002831, at *7. The Court of Federal Claims also refused to rely on the opinion of an expert who "attempted to pass off another's work as his own." *Raymo v. Sec'y of Health & Hum. Servs.*, No. 11-0654V, 2014 WL 1092274, at *16 (Fed. Cl. Feb. 24, 2014). And the Middle District of Florida excluded an expert as unreliable after the expert "attempt[ed] to appropriate the opinions of [another expert] and play them off as her own, . . ." *Spiral Direct*, 2017 WL 11457208, at *2. Like the experts in *Moore*, *Raymo*, and *Spiral Direct*, Dr. Shumer's opinions should be excluded because he wrongly attempted to pass off the work of others as his own.

Second, Dr. Shumer testified that he had cited all the scientific research he gathered for his report. Ex. 1, 15:1-16:3. Dr. Shumer expressly said that he cited to "the research that I used in forming my opinion." *Id.* at 15:4-5. Dr. Shumer also reported that he relied on only a single source for his "Sports and Gender" opinions. *Id.* at 122:9-25. And Dr. Shumer did not cite to the reports by Dr. Safer or Dr. Rosenthal. *See* Ex. 2; *see also* Ex. 1, 232:6-14.

"Courts have also excluded as unreliable experts who gave 'deliberately misleading'

answers to questions about their reports or falsely swore under oath that they had provided all documents relied upon in creating their reports." *Thomsen*, 2023 WL 8701971, at *6. In one case, for example, the expert "testified under oath that all of the documents she relied upon in this case were attached as exhibits to her report." *Spiral Direct*, 2017 WL 11457208, at *2. However, the report that the expert plagiarized "was not among" the "nearly two hundred pages of documents attached to the report." *Id.* The expert "did not provide any citation or attribution to [the other expert] as the source of large sections of her report." *Id.* Like the expert in *Spiral Direct*, Dr. Shumer's opinions should be excluded because he did not cite the expert reports that he was plagiarizing.

Third, Dr. Shumer testified that he had not read expert reports from Dr. Rosenthal or Dr. Safer. When specifically asked if he had reviewed "any expert report that Dr. Rosenthal has written in any case," Dr. Shumer responded that he was "not aware of seeing anything like that." Ex. 1, 202:3-5. Dr. Shumer also initially testified that he had not reviewed any of the expert reports in West Virginia or any other sports case in which he was not involved. *Id.* at 43:25-44:3. For that matter, Dr. Shumer said that he did not even know who the experts were in those cases. *Id.* at 44:4-5.

"Reliability is undermined, for example, when an expert falsely testifies under oath that he has not reviewed any other expert reports, despite having copied his conclusions from another expert report in the same case." *Thomsen*, 2023 WL 8701971, at *6. In addition to criticizing the plagiarizing expert for claiming his report "was his original drafting," the Eastern District of Louisiana found it "particularly problematic" that the expert testified "that he had not reviewed other expert reports." *Moore*, 2012 WL 6002831, at *7. Only after being confronted with the copying did the expert concede "he saw" the other report "and at the very least took notes." *Id.* "The likelihood that substantial portions of [plaintiffs' expert] report do not reflect his original work is yet another reason the Court finds that [plaintiffs' expert] opinions in general are unreliable." *Id.* Like the expert in *Moore*, Dr. Shumer's opinions should be excluded because he denied reviewing other expert reports.

Fourth, Dr. Shumer testified that he did not plagiarize Dr. Safer or Dr. Rosenthal. When directly asked if he plagiarized either expert's report, Dr. Shumer denied it. Ex. 1, 202:6-17.

"[W]hen the plagiarism is so blatant that it represents deliberate lack of candor, it may cause the report to be unreliable enough to justify exclusion." *Henderson v. Lockheed Martin Corp.*, 723 F. Supp. 3d 1147, 1151 (M.D. Fla. 2024). Like in *Henderson*, "[h]ere, there is no question that Dr. [Shumer] extensively plagiarized his report." *Id.* "A side-by-side comparison speaks for itself." *Id.*; *see also* Ex. 5. "Because the report indicates a lack of intellectual rigor that one would expect from *any* expert, the plagiarism in itself is sufficient reason for exclusion here." *Henderson*, 723 F. Supp. 3d at 1152 (emphasis original). Due to the expert's plagiarism, the *Henderson* court excluded the expert at the summary judgment stage. *Id.* at 1154.

Dr. Shumer's plagiarism, and his attempts to avoid acknowledging it, are substantively no different than what happened in the *Henderson*, *Moore*, *Raymo*, and *Spiral Direct* cases. Dr. Shumer passed the work off as his own. He claimed to have cited all the sources for his opinions, even though he did not cite to either expert report that he plagiarized. He also denied reviewing the expert reports. Finally, Dr. Shumer directly denied plagiarizing the reports before he was presented with numerous examples of his plagiarism.

For these reasons, Dr. Shumer's extensive plagiarism requires his exclusion. Dr. Shumer admitted that he committed plagiarism as defined in the Standard Practice Guide of his employer, the University of Michigan. *See* Ex. 1, 240:21–241:1. Accordingly, he failed to "employ[] in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999).

III. Dr. Shumer should be excluded as unreliable because his opinions lack the necessary qualifications and support.

Plagiarism "may demonstrate the proffered expert's lack of expertise." *Thomsen*,

2023 WL 8701971, at *6. Dr. Shumer's extensive plagiarism underscores his lack of expertise on the issues relevant to this case.

A. Dr. Shumer is not qualified to offer expert opinions on sports.

"The question of admissibility only arises if it is first established that the individuals whose testimony is being proffered are experts in a particular scientific field; . . ." *Daubert*, 43 F.3d at 1315. Rule 702 requires an expert to be qualified "by knowledge, skill, experience, training, or education." Fed. R. Evid. 702. Dr. Shumer lacks the sufficient qualifications to serve as an expert on sports-related issues.

Dr. Shumer does not have any education or training relevant to his sports performance opinions. Dr. Shumer does not have a degree in sports science, exercise science, kinesiology, athletic training, or physical education. Ex. 1, 115:19-21, 116:3-4, 116:11-12, 116:19-20, 117:2-3. Dr. Shumer also has not taken any classes in his formal education on exercise science, kinesiology, physical education, exercise physiology, motor control, or sports psychology. *Id.* at 118:22-119:8.

Dr. Shumer also does not have any experience or skill relevant to his sports performance opinions. Dr. Shumer has not competed in the Olympics or any level beyond high school. *Id.* at 120:8-12. Dr. Shumer has not coached athletes in middle school, high school, college, professional sports, or the Olympics. *Id.* at 120:14-23. Dr. Shumer has never coached girls' sports. *Id.* at 121:7-8. Furthermore, Dr. Shumer has not observed any of his patients playing sports, timed them running, or measured their jumps, grip strength, or muscle mass. *Id.* at 143:4-17. When it came to his knowledge of body changes due to puberty, Dr. Shumer admitted that he was not an expert in "[e]xtrapolating those to how each of those changes impact sports performance in various sports." *Id.* at 143:24-144:1.

Dr. Shumer further testified that he was not an expert in sports participation, track and field, volleyball, basketball, or cross-country. *Id.* at 121:7-23. Dr. Shumer also acknowledged that he was not an expert on what constitutes an unfair competitive advantage in sports. *Id.* at 121:24-122:1, 141:3-5, 142:11-16, 176:10-15. Dr. Shumer explained that he was "not presenting any expertise in inclusion or exclusion from sports,"

and he was "not an expert on a body of literature related to that." *Id.* at 123:11-17. Dr. Shumer also testified that he was not an expert on when it was appropriate to separate men and women on the basis of sex in sports. *Id.* at 147:19-148:4, 149:7-10.

Dr. Shumer does not possess the qualifications needed to testify on issues relating to sports. His opinions should be excluded.

B. Dr. Shumer has no objective proof of his own demonstrating that his opinions are good science.

"One very significant fact to be considered is whether the experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying." *Daubert*, 43 F.3d at 1317. "That an expert testifies based on research he has conducted independent of the litigation provides important, objective proof that the research comports with the dictates of good science." *Id.*

Dr. Shumer has no independent research related to his opinions in this case. Dr. Shumer has not published any peer-reviewed articles on sports science, exercise science, kinesiology, athletic training, or physical education. Ex. 1, 115:22-24, 116:5-7, 116:13-15, 116:21-23, 117:4-6. Nor has Dr. Shumer published or conducted research on the prepubertal differences between natal boys and girls. *Id.* at 123:1-6. "That plaintiffs' experts have been unable or unwilling to publish their work undermines plaintiffs' claim that the findings these experts proffer are 'ground[ed] in the methods and procedures of science' and 'derived by the scientific method.'" *Daubert*, 43 F.3d at 1318 n. 9 (citation omitted). Indeed, "the lack of any peer review or publication" of Dr. Shumer's sports performance theories "cuts against the reliability of [Dr. Shumer's] opinions regarding such in this case. *Martinez v. Terex Corp.*, 241 F.R.D. 631, 639 (D. Ariz. 2007).

Dr. Shumer also has not conducted any primary research on sports science, exercise science, kinesiology, athletic training, or physical education. Ex. 1, 115:25-116:2, 116:8-10, 116:16-18, 116:24-117:1, 117:7-9. Furthermore, Dr. Shumer has not gathered or evaluated any sports data at any level. *Id.* at 185:17-22. "[I]t is clear that the opinion is

not based upon any independent research, but rather has arisen solely in the context of this litigation." *Martinez*, 241 F.R.D. at 640.

In short, Dr. Shumer did not "base[] his testimony on preexisting or independent research." *Daubert*, 43 F.3d at 1317.

C. Dr. Shumer has no objective proof from others demonstrating that his opinions are good science.

"If the proffered expert testimony is not based on independent research, the party proffering it must come forward with other objective, verifiable evidence that the testimony is based on 'scientifically valid principles.'" *Id.* at 1317-18. Since Dr. Shumer has no independent research on sports performance, this rule requires Plaintiffs to present "other objective, verifiable evidence" supporting Dr. Shumer's opinions. *See id.* "One means of showing this is by proof that the research and analysis supporting the proffered conclusions have been subjected to normal scientific scrutiny through peer review and publication." *Id.* at 1318.

Almost all of Dr. Shumer's "Sports and Gender" and case-specific opinions do not identify any scientific support. Of the 15 paragraphs in the final two sections of Dr. Shumer's report, 14 paragraphs are not supported by any citation. Ex. 2, ¶¶ 35-36, 38-49. For example, Dr. Shumer provides no scientific support for his opinion that "[b]efore puberty, girls and boys generally perform at the same level with some small differences at the margins (some favoring boys, some favoring girls)." *Id.* at ¶ 36; Ex. 1, 131:7-9. Dr. Shumer also cited no peer-reviewed literature or other authorities to support his next sentence, in which he opined, "In contrast, post-pubertal boys as a group generally begin to show a significant athletic advantage over post-pubertal girls due to their exposure over time to the elevated levels of testosterone associated with male puberty." Ex. 2, ¶ 36; Ex. 1, 136:17-19. Four other substantive paragraphs came exclusively from information from Plaintiffs' counsel. Ex. 2, ¶¶ 42-45. Dr. Shumer did not independently verify any of this information. Ex. 1, 242:12-18.

Dr. Shumer's unsupported opinions should be excluded. "Rule 702 requires that

expert testimony relate to scientific, technical, or other specialized knowledge, which does not include unsupported speculation and subjective beliefs." *Guidroz-Brault*, 254 F.3d at 829. Courts have excluded experts who failed to cite a single study supporting their opinions. *See, e.g.*, *Cabrera v. Cordis Corp.*, 134 F.3d 1418, 1423 (9th Cir. 1998); *Garcia v. Reebok Int'l Ltd.*, CV-13-02785, 2014 WL 12558296, at *4 (C.D. Cal. Feb. 14, 2014); *see also McDowell v. Brown*, 392 F.3d 1283, 1300 (11th Cir. 2004) ("an expert opinion is inadmissible when the only connection between the conclusion and the existing data is the expert's own assertions"). "[T]he *ipse dixit* of the expert" is insufficient. *Gen. Elect. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

Only one paragraph in Dr. Shumer's final two sections contains a citation, and it is to a single article. Ex. 2, ¶ 37; Ex. 1, 122:9-12. Dr. Shumer understood that his report should provide all the necessary support for his opinions. Ex. 1, 122:22-25. However, he did not cite any other journal articles or other sources to support his "Sports and Gender" opinions. *Id.* at 122:13-21.

The only article cited by Dr. Shumer, by Handelsman (2018), does not even support Dr. Shumer's opinions. First, Dr. Shumer admitted that boys always had an advantage over girls in a figure in the article that shows running and jumping data. *Id.* at 153:3-24, 156:24-157:5. Second, Dr. Shumer could not identify any data or information in the article relating to prepubertal children. *Id.* at 152:25-153:2, 155:20-156:23. Third and finally, the Handelsman article is secondary research, which means it is simply reviewing articles. *Id.* at 146:21-147:4.

Dr. Shumer's inability to objectively support his opinions casts grave doubt on the reliability of his opinions. This doubt is exacerbated by Dr. Shumer's admissions that at least some of his opinions came as a result of litigation. Dr. Shumer admitted that he was offering opinions on a "scientific question"—the definitions of gender identity and biological sex—that he did not consider until he became a litigation expert witness. *Id.* at 67:1-8, 68:7-10. Dr. Shumer could not remember being asked about the definitions of gender identity or biological sex outside of litigation. *Id.* at 68:17-20.

Dr. Shumer's opinions lack reliability because he has failed to present objective proof that they represent good science. His opinions should be excluded.

CONCLUSION

For these reasons, President Petersen and Speaker Montenegro respectfully request that the Court exclude Dr. Shumer's testimony and reports from this litigation. In the alternative, President Petersen and Speaker Montenegro request that a *Daubert* hearing be held for Dr. Shumer.

Dated: March 5, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that, on March 5, 2025, I caused a true and correct copy of the foregoing to be filed by the Court's electronic filing system, to be served by operation of the Court's electronic filing system on counsel for all parties who have entered in the case.

/s/ Justin D. Smith

EXHIBIT 1

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF ARIZONA

JANE DOE, et al.,

Plaintiffs,

vs. Case No. 4:23-cv-00185-JGZ

THOMAS C. HORNE, in his official capacity as State Superintendent of Public Instruction, et al.,

Defendants.

_____/

The Videotaped Deposition of DANIEL SHUMER, M.D.,
Taken at 3535 Green Court,
Ann Arbor, Michigan,
Commencing at 10:02 a.m.,
Tuesday, February 18, 2025,
Before Cheri L. Poplin, CSR-5132, RPR, CRR.

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ALSO PRESENT:

Travis Jewell - Video Technician

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EXHIBITS

Ann Arbor, Michigan
Tuesday, February 18, 2025
10:02 a.m.

VIDEO TECHNICIAN: We are now on the record at 10:02 a.m. on February 18, 2025. Audio and video recording will continue to take place until all parties agree to go off the record. Please note that microphones are sensitive and may pick up whispering and private conversations.

This is the video recorded deposition of Dr. Daniel Shumer. This proceeding is being held at 3535 Green Court, Ann Arbor, Michigan.

My name is Travis Jewell. I'm a videographer on behalf of US Legal Support. I am not related to any party in this action nor am I financially interested in the outcome.

At this time would counsel state their appearances for the record, after which the court reporter will swear in the witness.

MR. SMITH: I'm Justin Smith with the James Otis Law Group in St. Louis, Missouri. I represent Arizona Senate President Warren Petersen and Speaker Steve Montenegro.

MS. BERG: Rachel Berg from the National

Center for Lesbian Rights on behalf of plaintiffs.

MR. CAPPS: Ken Capps appearing virtually also on behalf of the legislative leaders.

MR. POTTS: David Potts appearing virtually for the Gregory School.

COURT REPORTER: I couldn't hear it.

MR. RASSI: Justin Rassi from Debevoise & Plimpton also appearing for plaintiffs with Ms. Berg.

MR. SMITH: David, the court reporter couldn't hear you. I'm sorry. Do you mind repeating your appearance?

MR. POTTS: Sure. David Potts appearing virtually for the Gregory School.

MR. SMITH: Thank you, David.

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:

EXAMINATION

BY MR. SMITH:

Q. Could you please state your name for the record?

A. Daniel Shumer.

Q. Dr. Shumer, we haven't met before today, have we?

A. No.

Q. You have been deposed before, haven't you?
A. Yes.
Q. About how many times would you say you've been deposed?
A. I would say about 12 times.
Q. You're an old pro at this.
Is there any reason that you can't understand my questions today?
A. No.
Q. Is there any reason you can't give full and complete testimony today?
A. No.
Q. Do you understand you're under oath?
A. Yes.
Q. And do you understand that that means you're required by law to tell the truth?
A. Yes.
Q. Did you speak to -- with anyone to prepare for today's deposition?
A. Ms. Berg.
Q. I don't want to know about the contents of that conversation, but when did you speak with Ms. Berg to prepare for today's deposition?
A. Last week.
Q. About how long was that conversation?

A. Two conversations for two hours each -- or for one hour -- one hour and a half each.
Q. So a total of three hours?
A. Yes.
Q. Were those the only conversations that you had to prepare for today's deposition?
A. Yes.
Q. Were you shown any documents during the course of preparing for today's deposition with Ms. Berg?
A. I reviewed the expert reports that I prepared, the expert reports that other experts in this case prepared.
Q. When you say other experts in this case, do you remember the names of any of those experts, whose reports you reviewed?
A. Dr. Hilton, Dr. Blade, Dr. Budge, Dr. Carlson.
Q. Is that all the reports you reviewed?
A. Those are the names that I remember. I might be missing one, but I don't think so.
Q. Did you review any documents besides expert reports to prepare you for today's deposition?
A. I -- I reviewed the -- the bill.
Q. What do you mean by the bill?
A. The -- the bill related to sports participation passed by Arizona's legislature.

Q. Do you remember the name or the number of that bill?
A. No.
Q. Did you review any deposition transcripts that have been taken in this case?
A. No.
Q. So you haven't seen the deposition transcripts of any other expert witness in this case?
A. No.
Q. And you haven't seen the deposition transcript of any party in this case?
A. No.
Q. Have you ever talked with Dr. Stephanie Budge about this case?
A. No.
Q. Have you ever talked with Dr. William Shannon about this case?
A. No. William Shannon, I have reviewed his expert report.
Q. Dr. Shumer, when were you first retained to provide testimony in this case?
A. I believe it was early 2023.
Q. Who approached you about providing testimony in this case?
A. Ms. Berg.
Q. What were you asked to do in this case?

A. I was asked to provide an opinion based on my expertise in pediatric endocrinology as it relates to puberty, the timing and tempo of puberty, the treatment of gender dysphoria, and the effect of puberty, specifically testosterone, on the body as it relates to establishing a competitive advantage in sports.
Q. Are you being paid for your testimony in this case?
A. Yes.
Q. How much are you being paid?
A. $350 an hour.
Q. How many hours have you worked on this case?
A. I would estimate about ten.
Q. Have you billed those ten hours to the plaintiffs in this case?
A. Some of them. Not -- not all of them.
Q. So overall how much have you been paid for this case?
A. Somewhere in the order of $2,000.
Q. And then it sounds like you have about $1500 still to come based on your hourly rate?
A. That sounds -- sounds right.
Q. Well, $350 times ten hours would be about $3500; right?
A. Yeah.
MR. SMITH: I'd like to mark our first

exhibit for the day.

(Marked EXHIBIT 1 for identification)

BY MR. SMITH:

Q. Dr. Shumer, you've been handed what's been marked as Exhibit 1. Do you recognize Exhibit 1?

A. Yes.

Q. What is Exhibit 1?

A. It's an expert report written by me.

Q. Is that your expert report in this case?

A. Yes.

Q. Is Exhibit 1 a fair and accurate copy of the report that you submitted in this case?

A. It appears to be. As I was just flipping through, I just reminded myself that my -- my rate in this case is 300 and not $350, so I wanted to correct the record on that.

Q. Thank you.

A. Yes. It appears to be.

Q. And if we turn to Page 14 of your report. Is that your signature at the bottom of the page?

A. Yes.

Q. Is your report dated October 10th, 2024?

A. Yes.

Q. It was signed here in Ann Arbor, Michigan?

A. Yes.

Q. In Paragraph 50 --
A. Sorry. Can I make one more -- more correction? I think I might have said that I was retained in early 2023, but I'm still struggling with the fact that it's 2025, so I think it was early 2024, so . . .
THE WITNESS: Is that right?
A. I'm just -- I'm not sure when I was -- when -- when the case started, but . . .
BY MR. SMITH:
Q. We can cover those dates later. Let's look at Paragraph 50.
A. Sure.
Q. At the end of your report you declared under criminal penalty under the laws of Arizona that the foregoing is true and correct; is that right?
A. Yes.
Q. Dr. Shumer, some experts have teams of people that help them write their reports. Did you have such a team to help you write this report?
A. No.
Q. Did anyone help you write this report?
A. I -- I sent drafts to Ms. Berg, and she -- she helped to -- helped me understand if the topics I was covering were the topics that were appropriate and provided feedback, but I was the sole author of the

report.
Q. So if I understand you correctly, the words are yours, you may have gotten help at some point with feedback, but you -- you wrote them, you edited them, you approved them at the end of the day; is that fair?
A. Yes. Yes.
Q. What's your process for writing an expert report?
A. Can you help me understand what you mean?
Q. Well, you get retained in this case. How did you go about preparing what became Exhibit 1?
A. Well, I've written other reports for other reasons, and so some of the beginning part where I describe my background and my education, you know, came from materials that I've written before. When we start talking about the medical and scientific background on gender identity and gender dysphoria, again, some of -- some of that material is overlapping with other expert reports that I've written.
Q. And you were referring right then to the topic that begins on Page 6; is that right?
A. Yes.
Q. And you said some of that came from other expert reports that you had written?
A. Yes.
Q. What about the topic that begins on Page 9 at the top

that reads "The Medical Treatment of Gender Dysphoria in Adolescents"? Where did that material come from?

A. Yes. That's also overlapping with other reports that I've written, so I imagine that some of that material came from those reports.

Q. And then on Page 11 there's a category called "Sports and Gender" toward the bottom of the page. Where did the material on that section come from?

A. Yeah. So that -- that's unique to this case and one other case that I've been involved in in -- in Utah, so I don't remember which report I wrote first, but that material came from me thinking about the -- the question at hand and providing my expert opinion. And then the next section specific to the plaintiffs in this case was written by me as I understood the information regarding the plaintiffs.

Q. And you're referring there to the section that begins at the top of Page 13 "Plaintiffs and Arizona's Ban on Transgender Girls in Sports"?

A. Yes.

Q. And you said that was unique to this case?

A. Yes.

Q. And it was based on information that was provided to you?

A. That's correct.

Q. Does Exhibit 1, your expert report in this case, contain all of the research results that you gathered for purposes of your expert opinion?
A. So I cited to -- to research, and that was the research that I used in forming my opinion, yes.
Q. And the research citations, I see one set in Footnote 1 on Page 6. There's a number of articles listed in Footnote 1 on Page 6, aren't there?
A. Yes.
Q. And this is research that you gathered for purposes of this report?
A. Yes.
Q. And then if we continue on and flip to Page Number 9, you see in Footnote 2 another list of citations; is that right?
A. Yes.
Q. And that's more research that you gathered for this report?
A. Yes.
Q. And then if we continue on to Page 12, in Footnote 3 is an article. Do you see that?
A. Yes.
Q. And that's more research that you gathered for this report?
A. Yes.

Q. Is that all the scientific research that you cited in this report, Footnotes 1, 2, and 3?
A. Yes.
Q. Does Exhibit 1 contain all of your opinions supporting the plaintiffs in this case?
A. It reflects the opinions that I presented in -- at this time when I wrote my expert report. Since that time there's been review of defense expert reports and rebuttal reports that include other opinions, and of course I may have opinions if other information was presented to me, but this is -- this report represents my expert opinion at the -- at that point in the proceedings of this case.
Q. We'll talk about your rebuttal report later, so setting that aside.

As far -- when you drafted this report, you put everything in it that you believed was important to the case at that time?
A. Yes. Everything that I understood about the case that I wanted to include in my expert report, yes.
Q. I'd like to look at Paragraph 1 of Exhibit 1 on the first page. It lists in Paragraph 1 different employment you have at the University of Michigan.

Does Paragraph 1 still accurately reflect your current employment?

A. Since this I've been promoted to associate professor, so that's different. Otherwise it's accurate.
Q. What's the difference between an associate and an assistant professor at the University of Michigan?
A. It's just a different academic rank, so you can be promoted if you continue to participate in scholarly work, provide education, and perform your clinical responsibilities, and so it just means that -- that I demonstrated that I was doing those things to the extent that was necessary for that promotion, so assistant professor to associate professor follows an academic ranking process that would then terminate with a professorship, so professor would be the highest level in that -- in that ranking.
Q. When did you receive your promotion to associate professor?
A. It was sometime last year.
Q. Is associate professor at all related to tenure at the University of Michigan?
A. Not for clinical faculty. For university faculty it might be, but not for clinical faculty like me.
Q. Do clinical faculty like you ever become eligible for tenure?
A. Not to my knowledge.
Q. You said professor is the highest rank that you can

receive at the University of Michigan. When might you be eligible to receive the promotion to professor?
A. I would -- I would hope that if my career continues to be successful, in four or five years from now.
Q. So there's not like a time limit you have to wait before you can seek that promotion?
A. I'm not a hundred percent sure. I think -- it hasn't been something that I've been -- well, I guess my -- my -- my understanding is that it would be unusual to apply to become a professor so soon after becoming an associate professor, but I'm not sure if there's a time limit that you have to wait.
Q. Who makes the decision on promoting a person like you from assistant to associate professor?
A. There's an academic promotions committee at the university.
Q. Dr. Shumer, what's your annual income from the University of Michigan?
A. About $205,000 a year.
Q. And is that after you received your promotion what your current income is?
A. Yes.
Q. Is a percentage of your salary allocated to your clinical efforts?
A. So how my -- my employment works is that I have a

full-time position that we can call 1.0 full time equivalence, and then that -- within that 1.0 it's broken up into different percentages of how I spend my time or how my salary is -- is considered or allocated, so about 45 percent of my 1.0 or .45 of my FTE is clinical, and the other .55 is -- represents other activities that I'm expected to perform. So, for example, I'm in charge of the newborn screening program for the University of Michigan for infants that have a positive newborn screen for something called congenital adrenal hyperplasia. That's .2 of my FTE. Another .1 of my FTE is my role as the medical director for the Comprehensive Gender Services Program, which is the office at the university that oversees how the transgender population receives care through the health system. Then there's other various percentage -- percentages that make up the remainder.

Q. And then the .45 is allocated to your role as Clinical Director of the Child and Adolescent Gender Services Clinic at the University of Michigan?

A. No. The .45 represents my -- the expectation of seeing patients across all -- all clinics that I -- that I work in, so within that .45 -- so you can imagine that maybe someone with 100 percent of their effort devoted to clinical work might be seeing

patients let's say nine half days a week. Someone with .45 like me, I might be in clinic three to four half days a week. And then within my clinical effort I do two half days a week of seeing patients with gender concerns. I do two half days a week of seeing patients with other endocrinologic concerns. And then when I go up to -- that's what I -- my clinical effort in Ann Arbor, and then when I go to our satellite office in Marquette, Michigan, which is in the Upper Peninsula, I see patients with Type 1 diabetes there.

Q. About how much time do you spend at the Marquette satellite office seeing diabetes patients?

A. About nine -- I go there about nine weeks of the year and spend three to four days each time, and I'll see other endocrine -- endocrinologic problems in Marquette as well, but if I'm there for four days, it's three days of diabetes, one day of endocrine. If I'm there for three days, it's two days of diabetes and one day of endocrine when I'm in Marquette.

Q. Let me make sure I understand. So the .45 that you talked about of your normal job duties, you spend -- when you're at the Ann Arbor office, you spend about half your time on children with gender issues?

A. Correct.

Q. And then not all of that .45 is in Ann Arbor because

part of your time is spent in Marquette?
A. So actually the .45 is -- sorry. The -- I maybe didn't present this clearly. But the .45 does represent the clinical effort in Ann Arbor, and then the Marquette is a separate percentage. I think it's like 13 percent maybe, and that represents the clinics in Marquette. So I think if you add those two together, my clinical effort is something like .58.
Q. Do you receive compensation from any other source besides the University of Michigan?
A. For example, in this case I'm receiving compensation, and in other cases that I've worked in I've received compensation, but I don't have any other employer.
Q. Other than your work as an expert witness in various cases around the country, do you receive compensation from anyone other than the University of Michigan?
A. So in the last year I served on a advisory committee for a company that's making a medication for a condition called Prader-Willi syndrome, and that company provided compensation to serve on that advisory board. Occasionally I'm asked to give presentations at other medical institutions or universities, and they might give me an honorarium of a couple hundred dollars. And otherwise no.
Q. Did the medication you mentioned, does it -- is it

something that you might prescribe to someone who has gender dysphoria?

A. No. It's specific to this rare genetic condition and having to do with the fact that kids with Prader-Willi syndrome have something called hyperphasia, which makes them very hungry, so it's unrelated to this work.

Q. Do you receive compensation for any company that makes or markets what I'll call puberty blockers?

A. No.

Q. Do you receive compensation from any company that makes or markets cross-sex hormones?

A. No.

Q. And have you ever received compensation from companies that make either puberty blockers or cross-sex hormones?

A. No.

Q. You mentioned your work in other cases, so let's talk about that.

About how many other cases do you think you've been involved in as an expert witness, Dr. Shumer?

A. I think about 15.

Q. About how much have you been paid overall for your work as an expert witness across all of those

15 cases?
A. Not annually but just over time?
Q. Just a lump sum total.
A. Maybe $150,000.
Q. When did you first start testifying as an expert witness?
A. I would say around 2021. 2020 maybe.
Q. So in the last four or five years you'd estimate that you've received about $150,000 for your work as an expert witness?
A. Yes.
Q. Do you receive the same hourly rate of pay for each of the other cases in which you're an expert witness?
A. The rate that I have been paid has changed over time. The -- the range is between 300 and $400.
Q. How do you determine what rate to charge for a given case?
A. Well, it's just been over time I've -- initially my -- my first rate that I charged was $300, and then my current rate is $400, so if there was a new case, I would charge $400, and in previous cases I would charge 300 or 350.
Q. So in this case you're at the bottom end of your range at $300 an hour?
A. That's correct.

Q. If we look at Paragraph 14 in Exhibit 1, which is on Page 5. Page 5.
A. Oh, I'm sorry.
Q. Paragraph 14. In Paragraph 14 there's a list of cases that begin with the following sentence: "In the past four years, I have been retained as an expert and provided testimony on behalf of transgender plaintiffs in the following cases," and then there's a long list of cases that follow.

Does this list of cases in Paragraph 14 contain all the cases on which you've been an expert witness during the past four years?
A. At the time of the writing of this, yes.
Q. Let's go through these cases, then, beginning with the first one, which is Doe et al. v. Lapado in the Northern District of Florida.

About how many hours would you say you worked on that case?
A. I think there's also -- that's a misspelling. I think it's Ladapo. But this is tricky for me. Of course I have this all documented somewhere, but perhaps 12 hours.
Q. The next case is K.C. et al v. Medical Licensing Board of Indiana in the Southern District of Indiana.

About how many hours did you spend on that

case?
A. My -- my best estimate would be seven.
Q. Do you remember what the case in the Northern District of Florida, the Ladapo case, what issue that involved?
A. I think there was a couple issues there. One was a ban on gender-affirming care for minors in Florida, and another aspect of the case involved state-funded coverage for care.
Q. Did you opine on the Florida law at issue in that case?
A. Yes.
Q. Were you supportive of the Florida law at issue in that case?
A. No.
Q. And then in the Southern District of Indiana case, K.C. et al., do you remember what issues were involved in that case?
A. This is a similar restriction of care for children and adolescents in the state of Indiana.
Q. Did you testify in support of that Indiana law?
A. No.
Q. The next case in the list is Doe et al. v. Norman et al., in the Northern District of Georgia.

About how many hours would you say you worked on this case?

A. Maybe 16.
Q. Why did that case involve so many more hours than the first few cases we just discussed?
A. Well, the Florida one and the Georgia one, I actually went to those places and testified in court, whereas the Indiana one, there was just a deposition and work on a report, so that case didn't involve actually testifying in court. Maybe the Florida one or the Georgia one were more close in hours, but those two were more than the Indiana one for the reason I stated.
Q. Do you remember what issues were involved in the Doe, et al., v. Norman, et al., case in the Northern District of Georgia?
A. That was a similar question related to Georgia law restricting care for children and adolescents with gender dysphoria.
Q. Did you testify in support of the Georgia law at issue in that case?
A. No.
Q. The next case in the list is Noe et al. v. Parson et al., in Cole County, Missouri.

About how many hours would you say you worked on the Noe case?
A. I'd say, again, probably about 16.

Q. Do you remember what issues were involved in that Missouri case?
A. That was, again, related to a law or bill in Missouri restricting care for children and adolescents with gender dysphoria.
Q. Did you testify as an expert in support of that Missouri law?
A. No.
Q. The next case in the list is Loe et al. v. Texas et al., in Travis County, Texas.

About how many hours did you spend working on the Loe case as an expert witness?
A. I'm going to say 16 again.
Q. Was there in-person testimony required for this case too?
A. Yes.
Q. Do you remember the issues that were involved in the Loe case in Texas?
A. It was, again, a state bill or law restricting care for the treatment of gender dysphoria in children and adolescents.
Q. Did you provide expert testimony in support of the Texas law?
A. No.
Q. The next case in the list is Roe et al. v. Herrington

et al., in the District of Arizona.

About how many hours did you spend on this Arizona case?

A. My guesstimate would be eight hours.

Q. Do you remember what issues were involved in the Roe Arizona case?

A. I believe this was a case pertaining to how people may change their gender marker on official IDs or birth certificates.

Q. Were you retained by Ms. Berg's law firm for that case in Arizona?

A. I believe so.

Q. Did you testify in support of the Arizona birth certificate law?

A. No.

Q. The next case is called Dekker v. Weida in the Northern District of Florida.

About how many hours did you work on the Dekker case?

A. Here I'm struggling to remember the differences between Doe v. Ladapo and Dekker v. Weida. They both were related to restrictions on care, but I'm having trouble remembering which issues were which and -- and so it's a little harder for me to give you an hour estimate. I -- I would say, you know, unconfidently

ten hours, but I'm, again, struggling to remember what exactly the differences between those two cases were.

Q. You gave me a list of the issues in the Ladapo case, and do you remember there being any differences in the Dekker case with the issues that you described earlier?

A. It was similar. And perhaps the comment I made about the coverage was for one versus the other. There was I remember an issue related to adults and what other -- certain restrictions that adults could -- could be presented with when trying to receive appropriate care, and so between those two cases I think those -- those were the issues covered in both cases I was an expert for the plaintiffs in opposition to the law.

Q. And I think you just answered my next question. It sounds like you did not testify in support of the Florida law in the Dekker case?

A. Correct.

Q. The next case in the list is Boe v. Marshall in the Middle District of Alabama.

About how many hours would you say you worked on the Boe case?

A. I feel like there were more hours in that case comparatively, so maybe 20.

Q. Why do you feel that there were more hours in that Boe case?
A. I think in that case there were several rounds of reports that -- that were -- that were presented and then depositions, so . . . And I didn't travel to Alabama to testify, but I'm just feeling like I spent more time on that case than some of the others, so that's why I gave a higher number.
Q. Were you retained by the United States Government as the expert in Boe?
A. Yes.
Q. So the federal government was the party you were working for in the Alabama case?
A. Yes.
Q. Is that the only time that you've been an expert for the federal government?
A. Yes.
Q. Has your status as an expert in that Boe case changed since the change in presidential administrations?
A. Yes.
Q. How has it changed?
A. The -- I'm no longer retained by the federal government.
Q. How did you learn that you were no longer retained by the federal government?

A. A couple ways. One of the attorneys that I had been working with notified me and then I got an email notification.
Q. What did the email notification tell you about your status as an expert witness?
A. That it was no longer -- that I was no longer retained, that the contract was terminated.
Q. Were you given any reason for the federal government terminating your contract in the Alabama Boe case?
A. I'm not sure if there was a specif -- if the email said a specific reason. I -- I believe that the federal government isn't participating in the case anymore is the reason, but I'm not sure if that was stated in the email.
Q. When did you receive notification that your contract was being terminated by the federal government?
A. I think it was two weeks ago.
Q. The cases that we've looked at in Paragraph 14 so far, did any of those cases involve any sports performance issues?
A. No.
Q. In the Alabama case, did you testify -- do you remember the issues that were involved in that Alabama case?
A. Yes. It was similar in that there was an Alabama law

or bill that was passed to restrict access to care for transgender adolescents, and so I was an expert for the plaintiffs opposed to the law.

Q. Once again, you did not testify in support of the Alabama law?

A. Correct.

Q. The next case in the list in Paragraph 14 is Roe versus the Utah High School Activities Association in Salt Lake County, Utah.

About how many hours did you spend on the Roe Utah case?

A. My estimate would be 12.

Q. You didn't have to travel for that deposition very far, did you?

A. No.

Q. Was that held in Detroit?

A. It was in Romulus, Michigan.

Q. Not far from here; right?

A. Correct.

Q. Do you remember the issues involved in the Roe Utah case?

A. Yes. Similar to this case, I was asked to provide an expert opinion related to puberty, the effect of puberty on the body and the effect of testosterone specifically on athletic performance as there was a

similar question raised in that case as there is in this case.

Q. Was that the first time that you testified on a sports law?

A. Yes.

Q. Did you provide expert testimony in support of Utah's sports law?

A. No.

Q. The next case on the list is Menefee versus the City of Huntsville Board of Education in the Northern District of Alabama.

About how many hours did you spend on the Menefee case?

A. I'm going to say six.

Q. Do you remember what the issues were in the Menefee case?

A. Yes. This was a student that had raised a complaint against the school district related to concerns of discrimination, and my expert report in that case was related to the -- related to topics of gender identity, gender dysphoria, and I did not testify or provide a deposition in that case but provided an expert report on topics related to my area of expertise.

Q. It sounds like there was not a state law at issue in

the Menefee case; is that right?
A. Correct.
Q. The next case is Flack versus the Wisconsin Department of Health Services in the Western District of Wisconsin.
About how many hours did you spend on the Flack case?
A. Now we're going back in time further, so I'm -- I'm saying numbers with the caveat that -- that my memory isn't perfect on these, but I would say something -- something like ten hours.
Q. Do you remember what the issues were in the Flack case?
A. I believe this was a plaintiff who was having trouble receiving coverage for a medically necessary procedure and so I was giving an opinion related to standard care for gender dysphoria.
Q. Was there a state law or policy at issue in the Flack case; do you know?
A. I don't think so.
Q. Then the last case on Page 5 is Whitaker versus Kenosha Unified School District Number 1 Board of Education in the Eastern District of Wisconsin.
About how many hours would you say you worked on the Whitaker case?

A. Again, I'd say about ten.
Q. Do you remember what the issues were in the Whitaker case?
A. This has some similarity -- similarity to the Menefee case where it was a student having trouble with their school district, and my role was to provide an expert report related to gender identity and the management of gender dysphoria and those sorts of topics.
Q. It sounds like there was not a state law or policy at issue in the Whitaker case?
A. Correct.
Q. If we turn the page to Page 6, there's a custody case referenced. Did that case involve the validity of a state law or policy?
A. No.
Q. Does Paragraph 14 identify all the cases in which you've served as an expert witness during the past four years?
A. At the time of the writing of this it did, yes.
Q. So that means that at the time of the writing, which was October 10th of 2024, there are no cases that you've been an expert witness in that are not listed in Paragraph 14?
A. I did my best to make this list complete, so that -- that's my belief, yes.

Q. Did you testify as an expert in many cases outside of the past four years?
A. No.
Q. Did you testify in any cases outside of the past four years that are not listed in Paragraph 14?
A. I don't think so.
Q. So other than the custody dispute at the end of Paragraph 14, let's set that to the side, so all the cases that are in Paragraph 14 on Page 5, has every case in which you provide expert testimony and expert report involved a law or a policy related to transgender people?
A. Well, I'm not sure if we count the Men -- sorry. Did you say -- would you include the Menefee and Flack and Whitaker cases in that? I'm not sure if those would be related to a law or policy. But other -- the other ones, yes.
Q. Okay. So not those last three cases in the list, but the -- all the preceding cases, the Ladapo case, the KC case, the Norman case, the Parson case, the Texas case, the Herrington case, the Dekker case, the Boe case, and the Utah case, all of those involved a law or policy related to transgender people?
A. Yes.
Q. And all those cases I just read off, have you been

opposed to the state law or policy in all of those cases in which you were an expert?

A. Yes. Well, I guess, you know, maybe more accurately, the -- in each of those cases I'm providing an expert opinion based on my -- my area of expertise, which is pediatric endocrinology, and my area of special -- my area of expertise within pediatric endocrinology, being gender dysphoria and assessment and management of gender dysphoria, so the -- in each of those cases I would say my primary role was to provide that expertise, and it is also true that the side that retained me was opposed to a law or bill related to transgender health in some way.

Q. Put another way, have you ever provided expert testimony that supported a state law or policy on transgender issues?

A. I haven't had that experience, no.

Q. I'd like to cover one more topic before we take a break. You talked about the Utah case involving sports issues. Did you submit an expert report in that case?

A. Yes.

MR. SMITH: I'd like to mark as Exhibit 2.

(Marked EXHIBIT 2 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've just handed you what's been marked as Exhibit 2. Do you recognize Exhibit 2?
A. Yes.
Q. What is Exhibit 2?
A. This is a declaration written by me in the Utah case that we were just describing.
Q. If we turn to Page 10 of Exhibit 2. Is that your signature in the middle of the page?
A. Yes.
Q. Is this report dated June 16, 2022?
A. Yes.
Q. Was this the first report that you'd ever prepared on a -- what I'll call a sports law?
A. I believe so.

MS. BERG: Just objection to the phrasing. This is not a report. It's a declaration in support of preliminary injunction.

MR. SMITH: Thank you. I will rephrase.

BY MR. SMITH:
Q. Was this the first declaration that you had provided on a state sports law, Dr. Shumer?
A. I believe so.
Q. Had you prepared any expert reports on state sports laws prior to this declaration of June 16th, 2022?
A. If this is the first declaration from this case, then

no.
Q. And in that case you provided a declaration and then I believe was there an expert disclosure instead of an expert report about your testimony? Does that sound right?
A. It does.
Q. I want to make sure that I keep track. So in the Utah case you might not have prepared an expert report, just a declaration or a rebuttal declaration; is that right?
A. I think these terms are a little over my head.
Q. You don't differentiate between declaration and report when you are talking about your expert work?
A. Correct.
Q. I will try to be as precise as I can.
Dr. Shumer, are you involved in any challenges to a sports law in New Hampshire?
A. So I have been retained, I believe, but there's been no deposition or testimony related to that matter.
Q. Have you provided any expert reports or declarations in the New Hampshire case?
A. I believe so.
MR. SMITH: I'd like to mark Exhibit 3.
(Marked EXHIBIT 3 for identification)
BY MR. SMITH:

Q. Dr. Shumer, do you recognize Exhibit 3?
A. Yes.
Q. What is Exhibit 3?
A. It's a declaration related to a challenge by plaintiffs in New Hampshire.
Q. Is this a challenge to a sports law in New Hampshire?
A. Yes.
Q. If we turn to Page 9, the very last page. Is that your signature at the top of the page?
A. Yes.
Q. Is this declaration dated August 13th, 2024?
A. Yes.
Q. Does it appear to be a fair and accurate copy of your declaration?
A. Yes.
Q. I don't believe I asked that question for Exhibit 2. So just to make sure, was Exhibit 2 a fair and accurate copy of your declaration in the Utah sports case?
A. Yes.
Q. Continuing on in Exhibit 3. The date of August 13, 2024, was before you submitted Exhibit 1 on October 10th, 2024, in this case; is that right?
A. Yes.
Q. Why, then, is this New Hampshire case not included in

Paragraph 14 of Exhibit 1?
A. Because I didn't provide testimony in the New Hampshire case.
Q. So Paragraph 14 does not include cases in which you had expert reports or declarations but not deposition or trial testimony?
A. Correct.
Q. In the New Hampshire case are you testifying in support of the New Hampshire law?
A. No.
Q. About how many hours have you spent on the New Hampshire case?
A. I would say three.
Q. Have you done anything in the New Hampshire case other than prepare the declaration we marked as Exhibit 3?
A. No.
Q. Returning to Paragraph 14, then. Are there other cases that you remember that involved an expert report or declaration that are not listed in Paragraph 14?
A. You're asking at the time of the writing of --
Q. At the time of the writing. Because I thought you testified earlier, and I may have misunderstood, that this was everything, and this New Hampshire case now you say is an exception, so I'm curious if there are other exceptions of cases that are not listed in

Paragraph 14.

A. Well, that's not an exception. Right? Because it says in the past four years I have been retained as an expert and provided testimony on behalf of transgender plaintiffs in the following cases, so -- so that's -- I believe that to be accurate. So you're asking me are there other cases that I've been retained on --

Q. Yeah.

A. -- or provided expert reports but not testimony? Because that wasn't something that I would have included in -- in this paragraph.

Q. I understand. Thank you for clarifying that for me. So Paragraph 14 includes every case that you gave a deposition or trial testimony --

A. Correct.

Q. -- during the past four years at the time of the writing?

A. Correct.

Q. Setting those cases aside, what cases have you served as an expert witness that did not include a deposition or trial testimony and therefore are not listed in Paragraph 14?

A. There may be some, but I don't -- I don't -- I don't have names right now to -- that I'm remembering.

Q. Exhibits 1, 2, and 3 are relating to sports laws in

Arizona, Utah, and New Hampshire.

Have you been involved in any other case involving a state sports law?

A. No.

Q. So you haven't been involved in any case involving Idaho's sports law?

A. No.

Q. You haven't been involved in any case involving West Virginia's sports law?

A. No.

Q. You haven't been involved in any case involving Tennessee's sports law?

A. No.

Q. You haven't been involved in any case involving Florida's sports law?

A. No.

Q. Have you studied the challenges in Idaho, West Virginia, Florida, or Tennessee even though you weren't involved?

A. No.

Q. Do you know the issues involved in those cases?

A. No.

Q. Do you know the experts involved in those cases?

A. No.

Q. Have you reviewed any of the expert reports in any of

those Idaho, West Virginia, Florida, or Tennessee cases?
A. No.
Q. Do you even know who the experts are in those cases?
A. I don't.
MR. SMITH: We've been going right about an hour, so if it's all right, let's take a short break. Off the record.
VIDEO TECHNICIAN: Going off the video record. The time is now 11:01 a.m.
(Recess taken at 11:01 a.m.)
(Back on the record at 11:10 a.m.)
VIDEO TECHNICIAN: Back on the video record. The time is now 11:10 a.m.
BY MR. SMITH:
Q. Dr. Shumer, you're the Clinical Director of the Child and Adolescent Gender Services Clinic at CS Mott Children's Hospital; is that right?
A. Yes.
Q. Do you have a shorthand for what you call that clinic so I don't have to use the full name every time I ask you about it?
A. CAGS. Child and Adolescent Gender Clinic. CAGS.
Q. CAGS it is. Did you found CAGS in 2015?
A. Yes.

Q. Why did you found CAGS?
A. I was -- I was recruited to do so. I -- I was -- I had experience and expertise in assessment and management of gender dysphoria having learned those skills during my training in pediatric endocrinology fellowship. There was -- there was a standard of care in management of gender dysphoria or gender identity disorder at that time that my institution didn't have services to provide that standard of care, and so the founding of CAGS filled that void.
Q. Have you been in charge of CAGS every day it has been in existence?
A. In charge? I would say that I'm the clinical director, so to the extent of that meaning that I'm in charge, yes.
Q. Is there someone else who has some sort of management responsibility for CAGS besides you?
A. I would say that the hospital, the -- A -- you know, our ACU, or Ambulatory Care Unit, my bosses, you know, would provide oversight to the work that I do, but no -- no other person directly, no.
Q. Would it be fair to say that you run the day-to-day of CAGS and then some of your supervisors have oversight responsibility given their location in the chain of command?

A. Yes.
Q. What are your responsibilities as the Clinical Director for CAGS?
A. I organize a weekly case conference where new patients that are going to be seen that week are presented by our mental health team. I organize a monthly meeting of providers to discuss things like when a -- how long is our wait? Is -- are there new providers coming in? Are there protocol questions? When there's a new provider joining the team, I might be asked to participate in interviewing that person or in training that person. So some -- those are some examples.
Q. How big is the team that you oversee in the CAGS clinic?
A. There's two mental health providers and I want to say seven medical providers and about four nurses.
Q. 12 or 13 people total?
A. Yes.
Q. As the Clinical Director, are you familiar with the operations of CAGS?
A. Yes.
Q. Is CAGS part of the University of Michigan?
A. Yes.
Q. If we turn to Exhibit 1 and look at Page 2. Paragraph 5 at the bottom of Page 2 says that CAGS has

treated over 600 patients since its founding.

Do you see that at the bottom of Page 2, Paragraph 5?

A. Yes.

Q. Is that number, 600 patients since its founding, still the correct number?

A. It's higher.

Q. What would the number as of today be?

A. It's an estimate. I would say somewhere in the thousand range.

Q. Does that mean that you've taken on approximately 400 new patients since October of 2024?

A. I'm not sure that that's what it means. I'm just trying my best to estimate the number of patients because I haven't pulled a report, and so it could be that the -- the number provided in this report is an underestimate or it could be that there's been 400 patients. I think at the time of writing this that was my estimate. My estimate now is about a thousand. So I think that's just the best I can do.

Q. Have you noticed any sort of uptick in new patients since October 2024?

A. Yes. I think that we've noticed a lot of patients coming from states surrounding Michigan as those states have had restrictions in care.

Q. The second sentence of Paragraph 5 on Page 2 says that you have personally evaluated and treated over 400 patients for gender dysphoria.

Was that number accurate in October 2024 when you issued this report?

A. To the best of my ability, yes.

Q. What would the number be today?

A. Maybe 450.

Q. Does that mean of the new patients that have come in since October you're not seeing all of the new patients?

A. Correct.

Q. Are you seeing roughly the same percentage of patients as you did in October 2024?

A. Same percentage of patients that -- as it relates to my total job? Yes.

Q. And the same percentage of new patients since -- in October you had seen 400 of the clinic's 600. Now you're saying that you've seen approximately 450 of the clinic's thousand. Are you seeing fewer new patients that come to CAGS clinic?

A. Me personally, yes.

Q. Why is that?

A. Because I have a full panel of patients, and so providers that have less patients on their panel are

open to seeing new patients more readily than me.
Q. Have you had to hire any new staff to deal with this influx of new patients?
A. We've had new providers that have joined our team. I don't know that I would say that it's a direct result of an increase in patients, but more providers interested in providing care that are working at our institution. So I think that -- that answers your question.
Q. Have you tracked the number of new patients that come to the CAGS clinic annually since its founding in 2015?
A. I've tried to do that a little bit. Not all the way back from 2015. But I think that in general we're seeing about a hundred new patients a year.
Q. Have you noticed any trends in the number of patients coming every year to the CAGS clinic?
A. I think more recently we're seeing more patients coming from farther away, and generally over time I would say that there is initially sort of a larger bolus of patients coming in the beginning because there -- it was a service that wasn't previously provided, so patients that were traveling from out of state to receive care were all of a sudden able to receive care closer to home than maybe less patients

for a couple years and then an increase as the general prevalence of patients presenting to care increased in Michigan and across the country.

Q. And it sounds like you see patients who live outside of the state of Michigan; is that right?

A. Some, yes.

Q. About how many states would you say you have patients that come from to the CAGS clinic?

A. Primarily it's two states, but there are probably patients -- a handful of patients from other states.

Q. What are the two primary states that come to Michigan to the CAGS clinic?

A. Ohio and Indiana.

Q. What services does the CAGS clinic provide?

A. It provides assessment of -- of referred patients, provides resources and referrals, community resources. When appropriate, it would provide medical interventions, such as GnRH agonists or gender-affirming hormones.

Q. Anything else?

A. I think that the -- the providers that are caring for these patients are pediatricians, so, you know, through the -- through the course of caring for patients we could provide other health supports, like assessment for depression or testing for sexually

transmitted infections, other basic pediatric care for the patients that we're seeing in clinic.

Q. Can GnRH agonists also be called puberty blockers?

A. Yes.

Q. So if I use the term "puberty blockers," do you know what I mean?

A. I do.

Q. About how many of the thousand patients CAGS collisions have received puberty blockers at one point in time?

A. I think my -- my best estimate would be about a fifth.

Q. 20 percent or 200 patients?

A. Yes.

Q. And so in your estimate there would be roughly 800 patients the CAGS clinic sees that have not received puberty blockers at any point in time?

A. Yes.

Q. Is gender -- can gender-affirming hormones also be called cross-sex hormones?

A. Yes.

Q. So if I use the term cross-sex hormones, you'll know what I mean?

A. Yes.

Q. About how many of the CAGS clinic's patients are currently or have at any point received cross-sex

hormones?
A. I would estimate maybe 65 percent. Some of those would be the same patients as the ones that receive the puberty blockers.
Q. And then since the number of 65 percent is larger than 20 percent, it sounds like there are some patients who receive cross-sex hormones who did not receive puberty blockers?
A. Yes.
Q. Would that be the majority of patients at the CAGS clinic who receive cross-sex hormones did not receive puberty blockers?
A. Yes.
Q. About how many patients at the CAGS clinic are being treated for gender dysphoria?
A. Well, I think that's a trickier question. You know, I think that for some patients there's an assessment that doesn't result in a diagnosis of gender dysphoria. For some patients there is a diagnosis of gender dysphoria, but that -- that condition doesn't require treatment with a medical intervention. Some folks that would qualify for a medical intervention don't meet criteria for that medical intervention for other reasons. And some -- some folks are treated for gender dysphoria with medications but not GnRH

agonists, testosterone, or estrogen. So the diversity in care is -- is pretty -- it's a very individualized treatment process. So I think I've been talking too long to remember the actual question, so can you -- can you say that again?

Q. Your answer was very helpful. I'd like to just maybe explore some of the categories you mentioned.

So you said that there are some children who are diagnosed with gender dysphoria but don't qualify for medical intervention; is that right?

A. Yes.

Q. About how many of the clinic's patients are in that category?

A. Maybe about 20 percent.

Q. Or about 200 patients?

A. Yes.

Q. And then you said that there are some children who are diagnosed with gender dysphoria who do not meet the criteria for medical intervention for some other reason; is that right?

A. Oh, I think I was including all of the folks in that first answer of 20 percent.

Q. Then you said that there's a group of kids that are diagnosed with gender dysphoria who are treated with medications that are not puberty blockers; is that

right?
A. Yes.
Q. About how many patients at the CAGS clinic are in that category?
A. I would say maybe ten percent.
Q. About a hundred patients; is that right?
A. Yes.
Q. Are there any patients at the CAGS clinic diagnosed with gender dysphoria that decline puberty blockers as a treatment?
A. Yes.
Q. About how many of those patients does the CAGS clinic have?
A. Well, I think that I want to just be careful about what the -- that question was, so by decline, I think that there's -- there's a few different possibilities there. You know, the decision to treat with puberty blockers is a shared decision with the clinician, the patient, and the family, and so, you know, it could be that someone would meet criteria for puberty blockers but yet they -- the distress that they feel associated with their gender identity isn't related to the onset of the development of secondary sex characteristics, so they're not necessarily declining. It's just that it's not -- it's not offered, but yet they still have

gender dysphoria.

Patients that are otherwise eligible to receive gender -- puberty blockers and the provider feels like it might be beneficial to them, there's various reasons why that prescription might not happen. The patient might not be able to provide appropriate assent for various reasons. The -- there may be mental health conditions that are not in reasonable control, in which case the medical intervention wouldn't be appropriate at that time. There may be -- there might not be parental consent after the informed consent process. So those are all different reasons that I'm not sure if all of those would fall into the category of patient declines, but -- but that's why I'm just having a little trouble giving you a number.

Q. Does the CAGS clinic receive any revenue for any patient that is receiving puberty blockers?

A. So I think that, just like any other medical visit, there's a billing code that we apply based on the level of complexity, so just like any other visit, but not the -- there's -- first of all, the CAGS clinic doesn't have its own funding mechanism or budget. It's just part of the division of pediatric endocrinology. So we don't have more or less revenue

based on the care that we provide as a provider or as a division.

Q. So any revenue generated by the clinic goes into maybe the university general budget or some other fund that you don't know?

A. Correct.

Q. Not to anything that you control?

A. Correct.

Q. Dr. Shumer, have you had any patients that told you that they'd come to the CAGS clinic because of a state sports law?

A. No.

Q. Has the CAGS clinic seen an increase or decrease in patients that you can tell related to state sports laws?

A. Well, we don't have a state sports law where I work. But no.

Q. Does the CAGS clinic receive any federal grants?

A. No.

Q. Does it receive any other federal funding?

A. Not specifically, no.

Q. Is the CAGS clinic entirely funded by the University of Michigan, to your knowledge?

A. The providers are employed by the University of Michigan, yes.

Q. So you don't depend on donations from private sources or anything like that?
A. No.
Q. Dr. Shumer, I'd like to turn to the report, the first substantive section in Exhibit 1. We'll look at Page Number 6. I'd just like to ask you how you define biological sex.
A. Sorry. Was there a paragraph that you said --
Q. Well, we're talking about this section, and we'll look at specific paragraphs in a moment. But just at a high level, how -- how do you define biological sex?
A. Well, I would say -- I would say the word "sex" is a word that attempts to separate humans in the context of, talking about people today, humans in the categories of male and female, and on the face of it that seems like a pretty simple task. Most of the time that determination is made by a simple examination of a baby's external genitals and the provider says it's a boy or it's a girl, you know, meaning it's a male or it's a female. As a pediatric endocrinologist, I know that there's more complexity to sex than that, that sex is -- has different biologic components, including our chromosomes, our anatomy, our gametes or reproduction -- reproductive cells, our hormones, and our gender identity.

Q. So you include gender identity in the definition of biological sex?
A. I do because there's biologic underpinning to one's gender identity, and, you know, through -- through my work especially with people with different sex development and also patients with gender dysphoria, I understand gender identity to be part of -- of what makes people one sex or another.
Q. Paragraph 24 on Page 8 of Exhibit 1. It's at the very top of Page 8.

Does Paragraph 24 contain your definition of biological sex?
A. Yes.
Q. Dr. Shumer, how do you define gender identity?
A. I would define gender identity as a deeply felt internal sense of one's self as a boy or a girl, a man or a woman, or somewhere on a spectrum between these things.
Q. And you said earlier that it's your opinion that there's a biological component to gender identity?
A. It is, yeah.
Q. In Paragraph 16, if we just flip back two pages to Page 6. Is Paragraph 16 your definition for gender identity?
A. Yes.

Q. I notice in both Paragraph 16 and Paragraph 24 there's no citation in either of those paragraphs. Does that mean that you wrote this definition and didn't need to cite any references?
A. Well, it means that I wrote it and didn't cite any references. You might disagree that I needed to make a citation, but I didn't.

MR. SMITH: I'd like to mark Exhibit 4.

(Marked EXHIBIT 4 for identification)

BY MR. SMITH:
Q. Dr. Shumer, you've been handed Exhibit 4. Do you recognize Exhibit 4?
A. Yes.
Q. What is it?
A. It's an article that I wrote 12 years ago titled "Current management of gender identity disorder in childhood and adolescence: guidelines, barriers and areas of controversy."
Q. Did you write this article in 2013?
A. Yes.
Q. Is it a fair and accurate copy of your article?
A. Yes.
Q. I'd like to turn to the second page of this document. It has a Page 70 in the bottom left corner. On the left-hand column toward the bottom do you see a

section titled "Terminology"?
A. Yes.
Q. The second sentence of that section says, "Biologic sex means the genetic, anatomic and hormonal determinants that define male and female."
Did I read that correctly?
A. Yes.
Q. That definition does not mention gender identity, does it?
A. No.
Q. If we look on the right-hand column toward the top of the page, fourth sentence down, you find the sentence "Gender identity is defined as a person's own classification of self as a male or a female."
Did I read that correctly?
A. Yes.
Q. That sentence does not reference any biological component, does it?
A. No.
Q. If we continue down to the next section, you see the section titled "Children"?
A. Yes.
Q. And this is an article that you wrote with Professor Spack?
A. Yes.

Q. Who is Professor Spack?
A. He's a pediatric endocrinologist and adolescent medicine doctor at Boston Children's Hospital. Now retired.
Q. Did he mentor or supervise you at some point?
A. Yes.
MR. SMITH: I'd like to mark Exhibit 5.
(Marked EXHIBIT 5 for identification)
BY MR. SMITH:
Q. I've handed you Exhibit 5, Dr. Shumer. Do you recognize Exhibit 5?
A. Not specifically. It looks like a PowerPoint slide from something that I put together in 2017, but I don't specifically remember this -- this talk.
Q. Do you disagree that you gave a talk in October of 2017?
A. No.
Q. If we look at Exhibit 1 just to make sure that we're on the same page. If we go back to your CV in the back of Exhibit 1. And if you flip forward four pages in your CV, we find the "Scholarly Activities, Presentations" section. Do you see that?
A. Yes.
Q. Okay. And then midway through that on the following page on Number 13, do you see a conference planner,

host, and presenter topic at the Michigan Medicine, October 2017?
A. Yes.
Q. Does that sound like the same conference at which Exhibit 5 may have been given?
A. It may be.
Q. You just don't have any specific recollection?
A. Yeah. I give -- I have given so many talks, and I'm not sure that this is that one, but I don't dispute that this is something that I created.
Q. I'd like to go in Exhibit 5, the presentation back 12 pages, and unfortunately this PowerPoint is not numbered. So after we flip past the cases, there's a slide entitled "Terminology." Do you see that slide?
A. Yes.
Q. The first bullet point says "Biologic sex - the genetic, anatomic, and hormonal determinants that define male and female." Did I read that correctly?
A. Yes.
Q. That definition does not reference gender identity, does it?
A. No.
Q. The next bullet point says "Gender identity - a person's own classification of self as male or female."

Did I read that correctly?
A. Yes.
Q. And that definition does not reference any biological component, does it?
A. Not specifically.
Q. Are those the same definitions that we just looked at in your article that we marked as Exhibit 4?
A. Yes.
Q. If we flip the page in Exhibit 5, there's a diagram of the gingerbread person. Do you see that?
A. Yes.
Q. Have you used this diagram before?
A. Yes.
Q. And you see that the definition of gender identity on the right-hand side is "Gender identity is how you, in your head, think about yourself. It's the chemistry that composes you (e.g. hormonal levels) and how you interpret what that means."
Did I read that correctly?
A. Yes.
Q. Do you agree with that definition?
A. Well, I think that -- I didn't write that definition. And I think with all of these -- these definitions, I think the idea is that the person that I'm presenting to may be hearing the term "gender identity" for the

first time and maybe have always thought of gender and sex as the same thing, and so when I'm trying to teach someone that these are different words with different meanings, yes, I have oversimplified.

You know, going back to the first -- the first article that I wrote, it very well could be true that -- that I wasn't thinking of gender identity as a component of sex at that time and that I would have written that differently 12 years later. When -- when I am talking to -- when I was talking to this audience in 2017, I presume that the intention was to help differentiate the idea of gender identity from sex but that the question about whether gender identity is a component of sex was not a topic that I was intending to address. In more contemporary talks that I give, I do include a slide on the biologic underpinning of sex -- of gender identity rather.

But the question that you ask is do I agree with this sentence. "Gender identity is how you in your head think about yourself." I don't have a strong disagreeing feeling about that sentence. It's not, you know, my definition. "It's the chemistry that composes you (e.g. hormone levels) . . ." I don't necessarily agree with that part of it. But I think that what the Genderbread person's definition of

gender identity is implying there is that there is something biological about gender identity. There's a picture of a brain next to the term "gender identity" that's sort of implying that this is our brain sex and -- and yet, you know, I didn't write that sentence and wouldn't have written that exactly the same way as -- as the author of this slide.

Q. Is gender identity objectively measurable, Dr. Shumer?

A. It's measurable by clinical interview, so when you ask someone in a clinical interview about their gender identity and you're able to assess that person's gender identity through clinical interview. Not the same way as chromosomal sex can be measured by karyotype or hormonal sex can be measured by a lab evaluation. In that way it's different.

Q. Since you said that gender identity can be determined through a clinical interview, that would be a subjective determination; right?

A. Well, I think that, in essence, yes, it's a subjective determination that's made by clinicians that are trained in obtaining information by a formalized clinical interview, just like the diagnosis of depression would be made by clinical interview using a subjective conversation or clinical interview with the patient.

Q. There's no medical test that you can administer to determine someone's gender identity, is there?
A. Correct.
Q. Returning to Exhibit 5 on that Genderbread person diagram. There's also a category for biological sex. Do you see that?
A. Yes.
Q. And this -- this diagram says that "Biological sex refers to the objectively measurable organs, hormones, and chromosomes."

Did I read that correctly?

A. "Biological sex refers to the objectively measurable organs, hormones, and chromosomes." Yes.
Q. Do you agree with that statement?
A. I think that those are -- are certainly components of sex, but as we've -- as I've mentioned, I would include gender identity as a component of sex, which, as we just discussed, is less objectively measurable.
Q. So in this presentation that you gave in October of 2017 you presented definitions to the audience that you didn't fully agree with?
A. I'm not sure if I had been as deeply thoughtful about these nuances of language in 2017 or not, but it doesn't precisely reflect my current understanding of these terms.

Q. When did your current understanding of these terms begin?
A. Well, I guess I'm just thinking about whether or not I ever had to consider whether gender identity was a component of sex before being asked that question, you know, as it pertains to some of these legal questions. It's not a scientific question that I had -- had necessarily considered in 2017. But I understood that there's biological underpinning to gender identity then, so -- so, you know, I do believe that at the time of this presentation -- you know, even I'm reflecting on my fellowship in -- prior to the writing of the first article that you showed me. I gave a presentation at that time about the effect of testosterone exposure in fetal life on gender identity. There's research related to that, especially coming from some of our patients with disorders of sex development. So understanding that there's biologic underpinning to gender identity has been something that I've known as a scientific fact since I believe 2015, but the semantics of it is something that I just maybe hadn't considered.
Q. Did I just understand you correctly to say that the semantics of these definitions you really didn't consider until you became an expert witness in

litigation?
A. I'm just trying to think about that because, you know, it's not a question that is applicable clinically whether or not gender identity is a component of sex by definition, so I'm just not sure when I -- when I first described it that way.
Q. Can you remember a time prior to litigation serving as an expert witness where you described biological sex and gender identity as you do today?
A. I'm not sure I was ever asked the question.
Q. And so the first time you remember being asked that question was as part of your role as an expert witness in litigation?
A. If the first time I was asked the question was then, then the first time I answered it was the way that I'm answering it now.
Q. Have you been asked outside of litigation, to your knowledge, about the definitions of gender identity or biological sex?
A. No.
Q. I'd like to hand you another article we'll mark as Exhibit 6.
(Marked EXHIBIT 6 for identification)
BY MR. SMITH:
Q. Dr. Shumer, I have handed you what's been marked as

Exhibit 6. Do you recognize Exhibit 6?
A. Yes.
Q. What is Exhibit 6?
A. It's an article that I wrote with two others titled "Advances in the Care of Transgender Children and Adolescents" published in 2016.
Q. One of the coauthors again Professor Spack?
A. Yes.
Q. Does Exhibit 6 appear to be a fair and accurate copy of your article?
A. Yes.
Q. You're listed as the lead author?
A. Yes.
Q. I'd like to turn to the second page of Exhibit 6. There's a section in bold "Definitions and Epidemiology." Do you see that?
A. Yes.
Q. The first sentence reads, "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 non-binary understanding of one's gender."
Did I read that correctly?
A. Yes.
Q. The next sentence reads, "This is in contrast to

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

Did I read that correctly?

A. Yes.

Q. Were those accurate representations of your understanding of those terms in 2016?

A. Certainly what I wrote as the definitions for this article, but, again, I would just reaffirm the idea that at the time of writing this article I also understood gender identity to have a biologic component to it, and -- and whether or not -- the reason that I didn't outline it -- outline those thoughts in these two sentences I don't remember.

Q. To that point, a biological component for gender identity is not mentioned in the definition for gender identity in Exhibit 6, is it?

A. It is not.

Q. And gender identity is not mentioned in the definition to biological sex in Exhibit 6, is it?

A. No.

Q. In fact, biological sex's definition says that it's in contrast to gender identity; is that right?

A. That's what it says.

Q. So this article represents that gender identity and

biological sex are different terms; is that right?
A. They're different terms, yes.
Q. Is it still your understanding that those are different terms?
A. Gender identity and biologic sex are different terms, yes. But that, as I've said, but gender identity is rooted in biology, a question that I -- I didn't address in this -- in these two sentences.
Q. Sitting here today, we still don't know what causes gender identity, do we?
A. Well, there's not a single cause of gender identity that we can point to. It's not an example of say a Mendelian trait where if you inherit this one gene, then you know what your gender identity is going to be. I can tell you that there's evidence to support the idea that there is a genetic component of gender identity. There's evidence to support the idea that hormonal exposures in fetal life contribute to our gender identity. There's evidence to support the idea that neuroanatomic brain structures are different in people with difference in gender identity. But that there's not a test or an x-ray that you can use to determine one's gender identity or a clear-cut cause and effect as is the case in some other areas in medicine.

Q. Is there also evidence to suggest that environmental factors may influence gender identity?
A. I think certainly the -- when we're talking about gender and gender identity, it's true that -- that gender identity doesn't exist in a vacuum, that we live in a social world that organizes people into sexes in different ways, in different places, in different contexts, in different eras of time, and so certainly our environment affects how we understand ourself and our gender.
Q. If we turn to Page 5 in Exhibit 6 before you. At the bottom of Page 5 you see the final paragraph begin with the sentence that reads, "Finally, individual environmental factors may influence the development of gender dysphoria."

Do you see that?

A. Yes.
Q. And that -- is that still your opinion?
A. I don't disagree with that.
Q. If we return back to Page 2 of Exhibit 6. The bottom paragraph on Page 2 reads, "As evidenced by the American Psychiatric Association's decision to remove the stigmatizing word 'disorder' from the lexicon, replacing gender identity disorder (GID) with gender dysphoria, there has been evolving depathologization

for those whose gender identity differs from their sex assigned at birth."

Did I read that correctly?

A. Yes.

Q. Is that your understanding of how the definition for gender dysphoria came to be?

A. That's my understanding. I don't have insider information on the decision to change gender identity disorder to gender dysphoria, but that's my understanding, yes.

Q. So in DSM-III and DSM-IV there's a gender identity disorder, and then that was recast in DSM-5 as gender dysphoria? Is that your understanding?

MS. BERG: Objection. Vague.

A. So there was a definition -- a diagnosis called gender identity disorder in the previous version of the DSM, and I think inherent in -- in that term you can get a sense that it's almost implying that the gender identity itself is disordered, whereas the current -- the current medical consensus or the -- the -- the current definitions now make it more clear that it's not the difference in gender identity itself that's disordered. It's the distress associated with that difference. And so that's my understanding of -- of that evolution.

BY MR. SMITH:
Q. Did you ever diagnose a patient with gender identity disorder when DSM-IV was in effect?
A. Yes.
Q. Have you diagnosed patients with gender dysphoria under DSM-5?
A. Yes.
Q. Are the diagnostic criteria similar between gender identity disorder and gender dysphoria?
MS. BERG: Objection. Vague.
A. They're similar, although the -- the -- the gender dysphoria definition is, as we -- as I've sort of implied, more focused on the negative mental health feelings of the difference, so they're not identical.
BY MR. SMITH:
Q. Are there any other differences between those two definitions that you recall?
A. I'd have to pull up the gender identity. It's been a while since I have looked at that since it's not -- it hasn't been in use for a long time, but I think there are -- there are differences but not that I can recall right now.
Q. You can't remember any here today?
A. Well, I think that there's one -- I think one difference is that gender dysphoria in childhood is a

diagnosis, gender dysphoria in adolescence and adulthood is a diagnosis, and I don't think -- I don't believe that the -- the distinctions were the same for gender identity disorder as a diagnosis. There's been more specifics about the different features of the, you know, the different primary and -- you meet a certain number of criteria from Part A and then also Part B for gender dysphoria. So the way to diagnose is -- is different. But the -- in essence, they both involve similar -- a similar phenomenon.

Q. In the CAGS clinic, before you see a patient, is there one of your team members that conducts a screening interview with a new patient?

A. Yeah. There's a series of evaluation steps.

Q. Do those evaluation steps include considering whether gender dysphoria is present in a new patient?

A. Yes.

Q. Do you ever see a patient prior to a determination being made that a patient is presenting with gender dysphoria?

A. Sometimes it works out that the visit with me has happened before the assessment visit, but then the assessment visit happens and then I'll see them afterwards. That's happened. But the -- the normal flow of patients through the clinic starts with a

referral. The referral then leads to a triage phone call with one of our mental health providers. The mental health provider will learn from the parent at that point what the goals of the referral are, and the goal could be simply community resources or it could be assessment. If there's a goal of assessment, then there will be a series of assessments scheduled with the social worker and followed by a visit with one of the medical providers if appropriate afterwards.

MR. SMITH: This is a good place to stop. Let's go off the record.

VIDEO TECHNICIAN: Going off the video record. The time is now 12:00 p.m.

(Recess taken at 12:00 p.m.)

(Back on the record at 12:31 p.m.)

VIDEO TECHNICIAN: Back on the video record. The time is now 12:31 p.m.

BY MR. SMITH:

Q. Dr. Shumer, what are the different kinds of treatment for gender dysphoria?

A. So I can think of non-medical ways that people address their gender dysphoria, such as engaging in therapy to better understand how your gender identity fits into the world. Non-medical interventions, like binding of the chest or using a different name or pronoun or

decisions about how one dresses or presents themselves to the world, sort of collectively described as social transition. Medical interventions can include things like -- well, I think of medical interventions generally as medications that stop things from happening that are unwanted or causing worsening dysphoria or medications that provide things -- cause things to happen that the lack of them happening is causing dysphoria. So in that first category would be things like puberty blockers, GnRH agonists, medications to address menstrual dysphoria, and the second category would be things like testosterone or estrogen. There's surgical interventions that are used to treat gender dysphoria primarily in adults. So those are some examples of possible treatments for gender dysphoria.

Q. Do you recommend all those different kinds of treatment -- let me rephrase that.

Is everything that you just mentioned options that you consider when meeting with a patient at the CAGS clinic?

A. Sure. There -- there are tools in a toolkit that a patient could use, sometimes already are using. You know, almost every patient that is referred to our -- our clinic has in some way embarked on a social

transition prior to assessment. Most of the time the transition process has started well before referral, but that all of these are -- are things that may or may not be helpful for each individual patient.

Q. Is there a one-size-fits-all treatment for gender dysphoria, in your opinion?

A. Well, there's certainly an outlined standard of care consisting of, you know, a sequence of interventions that -- that -- that we consider but that I agree that there's no one size fits all and that each individual patient, just like in any other area of medicine, requires an individualized assessment and management plan.

Q. We talked earlier today about the CAGS clinic prescribing puberty blockers and cross-sex hormones.

Does the CAGS clinic have any role in surgical interventions that you mentioned?

A. No.

Q. Do you refer any of your patients for surgical intervention?

A. Not technically. Patients that are -- are surgical candidates, there's a process for evaluation and management of surgical concerns in a separate part of our health system that doesn't require me to send a referral, but I'll sometimes counsel patients about

surgery or their questions around surgery.
Q. When you say our health system, do you mean the University of Michigan provides surgical interventions to people with gender dysphoria?
A. Not -- not adolescents with gender dysphoria, but they do for adults.
Q. Does the University of Michigan provide any chest surgery for any individual under 18?
A. No.
Q. Have they ever?
A. Yes.
Q. When did that change?
A. I think that there wasn't a formal policy on chest surgery, but within the last year there was a decision to restrict chest surgery to people over 18.
Q. Do you have patients under 18 who get surgery, either, you know, top or bottom surgery, from a different provider?
A. I've never had a patient under 18 that has had bottom surgery, and that -- I think you're referring to genital surgery. I have had patients under 18 that have gone to external providers for chest surgery, yes.
Q. Dr. Shumer --
(Off the record at 12:36 p.m.)

(Back on the record at 12:37 p.m.)

BY MR. SMITH:

Q. Dr. Shumer, some people who identify as transgender later identify as cisgender; right?

A. Yes. That's possible.

Q. And by cisgender, that means they identify with their biological sex?

A. Yes.

Q. So that includes children with gender dysphoria, you know, may identify as transgender at one point and later identify consistent with their biological sex; is that right?

A. Yes. There's certainly people that have -- their understanding of their gender identity changes over time in the way that you described.

Q. Do you know anyone who has detransitioned?

A. Yes.

Q. Have you had any patients who changed their gender identity while they were coming to the CAGS clinic?

A. I've had -- well, I think it's a tricky one because I certainly have had patients that have -- have made decisions about stopping or starting medications based on their -- their goals of care. I've had patients that have identified as -- have understood their identity as transgender and then later cisgender

that -- that have -- I can think of one patient that -- that meets that category and stopped their medication. Those patients represent probably less than one percent of the patients that -- that I've seen.

Q. What percent of patients have you seen that identify as transgender continue with that gender identity while they're going to the CAGS clinic?

A. Well, I think that I want to step back and say that there's sort of two types of patients that may present to the clinic, patients that are prepubertal and patients that are pubertal or in puberty. Patients that are prepubertal, the -- there is an understanding that one's gender identity before the onset of puberty is less predictive of their future gender identity than it is as puberty is starting. A patient that has a difference in gender identity and then is tangibly seeing the changes associated with the beginning of puberty and has persistence of their difference in gender identity is more likely then to continue to have that difference in gender identity. So I'd say for the patients that are prepubertal, which is a minority of patients that come to gender clinic, the percentage of patients that persist in their gender identity is lower than those who are pubertal, in

both -- in both groups I would say over 50 percent, but for the patients that have persistence or intensification of gender dysphoria as puberty starts or they understand that difference during puberty, the persistence of a transgender identity has been, in my clinical experience, in the 99 percent range.

Q. I'd like to turn with you to -- back to Exhibit Number 4. The second page of this, which is Page 70 of Exhibit 4.

Do you have Exhibit 4 now, Dr. Shumer?

A. Yes. Thank you. Which page?

Q. The second page, Page 70. If you look at the right-hand side under the "Children" section, the third paragraph down, which is the last full paragraph on that page, the first two sentences read, "The majority of children diagnosed with GID appear to 'desist' and identify with their biologic sex by early adolescence or adulthood. The percentage of 'persisters' appears to be between 10 and 27%."

Did I read that correctly?

A. Yes.

Q. Do you still agree with that statement?

A. Well, I -- I'm not sure about -- if the numbers are -- are the same numbers that I would use based on all the data that we have today, but the idea that, as I just

said, children who have a difference in gender identity, that gender identity is less predictive of their future gender identity. So I think we were just talking about CAGS patients. We don't have any patients that are coming to clinic when they're four or five years old. And if every patient with -- that's exploring gender identity in a normal healthy way in childhood were referred to CAGS, then those numbers might be closer to what we see. Really we're seeing patients that are close to pubertal age or having gender-based distress with parents and primary care doctors thinking that a medical intervention might be appropriate. So it's a different denominator than the -- the statistics that I cited here.

So I guess to answer your question, no, I don't dispute the idea that younger children that are healthfully exploring gender identity may or may not persist, but also true that those that are diagnosed with gender dysphoria as puberty begins and progresses are now less likely to persist, to -- to desist.

Q. And returning to my question. Do you still agree with the two sentences I just read here in Exhibit 4?

A. Well, gender identity disorder isn't a term that we use today, so I wouldn't agree with using that term. The majority of children diagnosed with gender

identity disorder, it says "appear to 'desist' and identify with their biologic sex by early adolescence or adulthood." I would -- I would -- based on my understanding of this body of literature, I would say by the onset of puberty instead of the way that I phrased it there. Otherwise I think the -- the gist of it is accurate.

Q. The last sentence on this page which carries over to the following page reads as follows: "There is no consensus among mental health professionals regarding appropriate intervention, or even appropriate goals of intervention, for children diagnosed with GID."

Did I read that correctly?

A. Yes.

Q. If the sentence had ended with the words "gender dysphoria" instead of "gender identity disorder," would you agree with that statement?

A. I don't think that I would agree with it, no.

Q. Why not?

A. I think that -- I think that today there's more consensus that social transition may be an -- may be an appropriate intervention for someone diagnosed with gender dysphoria in careful consideration of all the different options with the patient and family. Social transition is -- making decisions around social

transition isn't necessarily something that I'm confronted with as a pediatric endocrinologist, but -- clinically, but in terms of my understanding of the -- the literature, there's more -- there's -- I wouldn't say there's -- I wouldn't continue to say there's not general consensus about that.

Q. The last two sentences in this paragraph on now Page 71 read, "There is an increasing parental support for young children living as their desired sex; however, desisters may struggle with returning to live as their natal sex when their original desire to live as the opposite sex had been so strongly supported and encouraged by parents and providers, and even accepted by peers. The Endocrine Society's 2009 clinical practice guidelines oppose complete social role change in prepubertal children with GID."

Again, if the last word, "GID," was replaced with gender dysphoria, would you still agree with those two sentences?

A. Well, I don't -- I wouldn't disagree with the fact that that was the Endocrine Society's guidelines in 2009, and, you know, I think there's something to be said for the sentence before that, you know, how I would talk to parents and families around topics of social transition, which, again, I'm not often asked

to do, but would be, you know, clearly to follow the child's lead and let them know that any direction or outcome of their understanding of their gender identity is valid and will be supported and they will be loved regardless, so emphasizing that to families thinking through social transition decisions and I think raising that point, you know, is just an important one to -- to make then as it is now.

Q. It sounds like you're still comfortable with this language sitting here today?

A. Yes.

Q. Turning to the next page, which is Page 72. The very bottom left-hand side you see a section that begins "Barriers to Treatment." Do you see that?

A. Can you say again where it is?

Q. "Barriers to Treatment" at the bottom left of Page 72.

A. Yes. Okay.

Q. The second sentence of that section reads, "In addition, the patients who do present to centres equipped to follow the guidelines often present late, after Tanner stage 3, making pubertal suppression less effective."

Did I read that correctly?

A. Yes.

Q. Do you still agree with that statement?

A. Yes.
Q. I'd like to turn now to Exhibit 6. Do you have Exhibit 6 in front of you, Dr. Shumer?
A. Yes.
Q. I'd like to look at Page 6 of Exhibit 6. The first full sentence of that page reads, "Children referred for assessment due to gender non-conformity may demonstrate gender non-conforming behaviors at a very young age, sometimes as early as 3 years."
Did I read that correctly?
A. Yes.
Q. The next sentence reads, "Other persons may disclose a transgender identity later in adolescence or adulthood, without a history of gender non-conformity in early childhood."
Did I read that correctly?
A. Yes.
Q. Do you still agree with that statement?
A. Yes.
Q. The next sentence says, "Young children who are gender non-conforming or who identify as transgender may or may not continue to identify as transgender as adolescents and adults."
Did I read that correctly?
A. Yes.

Q. Do you still agree with that statement?
A. Yes.
Q. Next sentence. "In fact, there is evidence to suggest that for a majority of young children with cross-gender identity, this identity does not persist into adolescence; at the time of puberty their transgender identity may desist and perhaps evolve into a gay or lesbian sexual orientation."
Do you still agree with that sentence?
A. Yes.
Q. And did I read it correctly?
A. Yes.
Q. If we turn the page to Page 7 of Exhibit 6. You see the third paragraph on this page, the first sentence reads, "There is a lack of consensus among mental health providers regarding the goals of mental health treatment in pre-pubertal children."
Did I read that correctly?
A. Yes.
Q. Do you still agree with that statement?
A. No.
Q. Why not?
A. Well, I think, you know, it's hard to -- to -- it's hard to talk about each of these sentences in isolation. In the last paragraph we were going into

the next sentence which had to do with the fact that once puberty starts, it's more likely to persist, and so, you know, agreeing to each sentence one by one, you know, it's missing some of the context or flavor of the paragraph.

In this example, there's a -- the next sentence says, "Some argue that therapeutic goals should focus on reduction in dysphoria and acceptance of the biologic sex. Affirmative approaches help families to support a child's transgender identity and assist children and families with the logistics of making a social transition." So here we're discussing sort of two approaches to the -- the prepubertal child. And I think that my understanding of the consensus today is more of a neutral approach with love and acceptance of the child regardless of their gender identity, making decisions around social transition that if and when those decisions would be helpful for the child's distress while leaving options open for future decisions and that efforts to, quote unquote, change one's gender identity, you know, have been proven to be unsuccessful and harmful. So I think that -- that I wouldn't agree that there's this lack of consensus, but I also wouldn't agree that there's these two polar opposite ways to approach it

and that my -- my sense is that the modern consensus is an affirmative approach with -- with -- with flexibility.

Q. If we turn the page to Page 8. The second to last full sentence on this page at the bottom says that "The average age of onset of puberty is 10-11 years in females and age 11-12 years in males."

Did I read that correctly?

A. Yes.

Q. Is that still your understanding of the average ages for puberty in both females and males?

A. Yes. Here we're talking specifically about people assigned female and male at birth, yes.

Q. And so just to make sure we're on the same page, it's still your understanding that females at birth reach puberty at an average age of 10 to 11 and males at birth reach puberty at an average age of 11 to 12?

A. Yes.

Q. If we turn to Page 17 of Exhibit 6. Page 17.

A. Oh, I'm sorry.

Q. You see there's a series of case studies. I'd like to direct your attention to Patient 5. The Patient 5 is a biologic male, 12 years old, and, as you see in this paragraph, is put on puberty blockers at age 12. Do you see that? "Treatment with a GnRH agonist was

initiated."
A. Yes.
Q. And then the last sentence reads, "After discussion with the family and mental health professional, the decision is made to withdraw the GnRH agonist medication and allow male puberty to progress with continued supportive counseling in place."
Did I read that correctly?
A. Yes.
Q. Does -- was Patient 5 a patient that you had at some point in time?
A. No. I -- I don't know if any of these were based on actual patients. Just sort of amalgams of examples of things that may happen in the course of caring for gender diverse patients.
Q. Have you encountered a patient at the CAGS clinic like Patient 5 who's a biologic male, starts puberty blockers, and then stops at some point to allow male puberty to commence?
A. Yes.
Q. How often does that happen?
A. Not very often. I think if we're talking about the percentage of individuals like you described that start blockers, less than ten percent would stop the GnRH agonist and allow male puberty to progress.

Q. We're done with Exhibit 6 for now, Dr. Shumer.

MR. SMITH: I'd like to mark Exhibit 7.

(Marked EXHIBIT 7 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you Exhibit 7. Do you recognize Exhibit 7?

A. Yes.

Q. What is Exhibit 7?

A. It's an article that I'm the second author on, this article titled "Transgender and Gender Nonconforming Adolescent Care: Psychosocial and Medical Considerations," published in 2015.

Q. Does it appear to be a fair and accurate copy of that article that you coauthored?

A. Yes.

Q. If you turn to Page 2 of this article. Do you see a section in the middle entitled "Gender identity"?

A. Yes.

Q. The second paragraph in that section describes what we've been talking about with gender identity persisting and desisting. Do you see that discussion?

A. Yes.

Q. In the middle of that paragraph, the fourth sentence reads, "Estimates for the likelihood of gender dysphoria persisting from childhood into adulthood

range from 2-27% depending on the study."

Did I read that correctly?

A. Yes.

Q. And that was your understanding of the science literature at that point in time?

A. Yes.

Q. Do you know of any difference in the science literature today?

A. Well, I think that there's a lot more that I could say about likelihood of gender dysphoria persisting based on my understanding of research over the last ten years that, you know, it really depends on what the denominator is that we're talking about, so if we're talking about anyone who is exploring gender identity, anyone who has said I'm not a girl, I'm a boy, or anyone who has even made a social transition, that is a different denominator than folks that have been clinically diagnosed with gender dysphoria by a mental health provider and -- and also that that mental health providers, that the -- that the history shared by the individual may help the mental health provider to provide some anticipatory guidance about the likelihood of persistence. So, you know, I think there's -- I think that it's easy to understand that there's a difference between someone who is maybe more

interested in stereotypically feminine toys versus someone who has attempted to remove their penis out of distress. Those are two different types of children with different life experiences and experiences around gender, and that the second person I would say is more likely to have persistence of gender dysphoria than the first person.

So it -- so I guess I'm -- I'm explaining this to just help describe the challenge with the denominator. So I don't believe that 2 to 27 percent of referred patients to a gender clinic that are prepubertal will desist because those patients have a higher level of distress. There's a selection bias to those patients. But I don't dispute that 2 to 27 percent of people that have had -- young children that have had gender identity exploration will persist. I hope that sort of helps answer the question.

Q. I appreciate that response, Dr. Shumer.

MR. SMITH: I'd like to mark Exhibit Number 8 now.

(Marked EXHIBIT 8 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you Exhibit 8. Do you recognize Exhibit 8?

A. Yes.
Q. What is Exhibit 8?
A. This is a textbook published by Dr. Finlayson that I believe I wrote a chapter in this book.
Q. Was this published in 2019?
A. Yes.
Q. And then if we were to continue flipping to the Table of Contents, did you write Chapter 10 in this -- this book?
A. Yes.
Q. Chapter 10 titled "Duration of Pubertal Suppression and Initiation of Gender-Affirming Hormone Treatment in Youth"?
A. Yes.
Q. And since it is a book, I've included only Chapter 10 in Exhibit Number 8. If you were to flip through the rest of this, does this look like a fair and accurate copy of Chapter 10 that you coauthored for this book?
A. Yes.
Q. I'd like to direct your attention to Page Number 77. Do you see on Page 77 a section called "Unresolved Questions"?
A. Yes.
Q. At the bottom of that section on the left-hand side is a question that reads, "What about the large

percentage of adolescents seeking medical care well after the onset of puberty - are GnRH agonists helpful for these patients?"

Did I read that correctly?

A. Yes.

Q. Have you resolved that question since this textbook was written?

A. Well, I can tell you what I would do in a clinical scenario if presented with one. I certainly would have opinions about that, yes.

Q. I mean, it says "large percentage of adolescents seeking medical care well after the onset of puberty."

About what percentage would you say present to your CAGS clinic well after the onset of puberty?

A. Well, I --

MS. BERG: Objection. Vague.

A. I don't want to go back on the estimates that I gave you before because I think I answered this question to some degree. I think part of the question is what is -- what is well after the onset of puberty? So I think when I -- when I'm writing this sentence, I'm thinking about, for example, a trans boy who has completed breast development and is having periods. That is someone who I -- I wouldn't typically prescribe GnRH agonist for because GnRH agonists

wouldn't take away the breast development. It would stop the periods. But there's other ways to stop the periods besides GnRH agonists, presuming this patient isn't a candidate for testosterone.

A trans girl, you know, may -- may benefit from GnRH agonists for longer than a trans boy because the -- the cumulative exposure to testosterone over time changes her body in a way that is progressively more obvious from 15 to 16 to 17 and so on. So if someone is in a situation where they're presenting to care after the onset of male puberty, there may be more of a role for GnRH agonists to prevent that cumulative exposure to testosterone and physical changes that would make her look more masculine.

And, again, the other factor is readiness for estrogen. So, you know, is there -- you know, is the patient, you know, a candidate for estrogen? Is estrogen therapy indicated? And if so, then estrogen and spironolactone would be used insisted of the GnRH agonists.

So I think that you asked a question the percentage of people that are presenting well after the onset of puberty. So I think if we're saying past the age where GnRH agonist would be helpful, there's a different answer for perhaps trans boys and trans

girls, but I would say probably about 50 percent of the patients are older than the age that I would think of GnRH agonist as a potential treatment.

BY MR. SMITH:

Q. At what age would that be where you don't think that GnRH agonist would be an effective treatment?

A. There's not an age that I would be able to -- to use to answer that question because it really depends on each individual patient, the timing and tempo of their puberty, and their goals of care.

Q. Is there a Tanner stage that you look to when determining whether puberty blockers might still be effective?

A. Not specifically.

Q. If we were to turn to 80 in Exhibit 8. On the bottom right-hand side you see "Case 4: the 15-Year-Old Transgender Boy at Puberty Stage 4."

Do you see that?

A. Yes.

Q. The first two sentences read, "Many transgender adolescents do not present for care at the time of onset of puberty. In our clinic, for example, approximately two-thirds of patients are presenting for care at puberty stage 4 or 5."

Did I read that correctly?

A. Yes.
Q. Were those the correct percentages back at the time Exhibit 8 was authored?
A. I think so.
Q. So the majority of your patients are presenting at Tanner stage 4 or Tanner stage 5?
A. More than half, yes.
Q. And at Tanner stage 4 or Tanner stage 5, are puberty blockers still effective in preventing puberty?
A. Again, I don't think that I would use the Tanner stage specifically. You know, maybe for trans boys someone at Tanner stage 5 I would have a hard time picturing a scenario where blockers would be helpful, but that's just not how I think about it. I think the point here is is that, you know, that it's -- it's more clear -- it's more clearly indicated at the onset of puberty or Tanner stage 2, but there can be considerations for the use of GnRH agonists later in puberty depending on each individual patient's goals of care and, again, timing and tempo of puberty.
Q. If a transgender girl, that being someone whose biological sex was male who identifies as a female, if they present at Tanner stage 4, has some form of puberty already occurred due to exposure to testosterone?

A. Probably. I think that, you know, Tanner staging, though, is specifically a physical exam finding specific to say the size of the testicles, the size of the genitals, the distribution of the pubic hair, and -- and doesn't -- you know, Tanner staging doesn't describe things like facial appearance or musculature. So it's used sort of as a physical exam descriptor which can be used as -- you know, the way that it's most helpful is to understand whether someone's puberty is normal or abnormal, whether someone's progressing through puberty at a normal or abnormal tempo, the timing is abnormal or normal. So someone that, as you described, is Tanner stage 4, that means that the testicles are, you know, 15 to 20 cc's, that there's pubic hair in the normal distribution but not on the legs yet, that the size of the phallus has grown but not to the normal adult size yet. Those are descriptions that would characterize Tanner stage 4. Many people at Tanner stage 4 will have significant changes to the rest of their body whereas others won't. There's not a, you know, an equivalent Tanner staging system for, you know, the change of the facial bones, for example. So someone that is at Tanner stage 4 that's a trans girl, you can imagine that for some of those folks there's been little impact of

testosterone on say facial changes that some boys -- biological males at Tanner stage 4 look very childlike and not very masculine, whereas others, the testosterone that they've produced to get to Tanner stage 4 has masculinized their features to a significant degree. For the former group, GnRH agonists might be more helpful than the later group.

Q. Do you test to find the testosterone levels in every transgender girl to whom you're considering puberty blockers?

A. No.

Q. What percentage of patients do you submit for testing for testosterone levels for transgender girls?

A. So I'll always check testosterone levels in folks taking estrogen and spironolactone because I'm concerned to keep the testosterone level suppressed, but actually having a testost -- a certain testosterone level isn't one of the factors for meeting criteria for gender dysphoria, so I won't necessarily check a testosterone level to prove that someone is at Tanner stage 2 if I can see that on physical exam because I don't like poking for labs for no good reason. I will measure testosterone levels on GnRH agonists if I'm concerned or the patient and family is concerned that the GnRH agonists aren't

working, but that reflexively measuring testosterone isn't part of my standard practice.

Q. What percentage, then, of patients who are transgender girls do you send to get testosterone tested so you can see their testosterone levels?

A. Probably two-thirds.

Q. So the majority of patients who are transgender girls, you test their testosterone levels?

A. As a -- as a whole, yes.

Q. And then approximately one-third of transgender girl patients that you have you do not submit for testosterone level testing?

A. And the situation there would mostly be the folks that are being treated with GnRH agonists where there's no clinical concern that the medication isn't suppressing their testosterone.

Q. And so of that group, the patients who arrive to you either prepuberty or at a stage at which you thought it was right to -- to administer puberty blockers, what percentage of that group do you send for testosterone level testing?

A. Can you explain the group again?

Q. These are the groups that are going to be on puberty blockers as transgender girls and because they're at let's just say Tanner stage 2 or earlier.

A. So I don't measure testosterone level in someone that's not pubertal. I don't typically measure testosterone level in someone that's Tanner stage 2 to help make the decision to start the GnRH agonists because it's a -- as a pediatric endocrinologist, I know how to assess for Tanner stage 2. But I will check if someone is -- if I'm unsure about the exam or if there's concern that the testosterone level is not suppressed on treatment with GnRH agonists. So that's a minority of patients in your hypothetical.

Q. And then during the course of those transgender girls receiving puberty blockers, do you ever, you know, send them for testosterone level testing just to make sure that the puberty blocker's working?

MS. BERG: Objection. Vague.

A. So I don't have a protocol that everyone on puberty blockers gets testosterone levels checked at certain frequency. I'll do it when there's a clinical question to answer. So I need to have a clinical reason to check the testosterone. But there's no -- I don't have a protocol that everyone on puberty blockers requires a testosterone level at a certain frequency, no.

BY MR. SMITH:

Q. What are clinical reasons that have caused you to

submit a transgender girl who's on puberty blockers to go get testosterone level testing?

A. Perhaps the patient feels like the -- there's a change in her genitals and wants to make sure that it's normal growth of getting older and not testosterone production and then we can assess that with a testosterone level.

Q. Has that happened to you or your patients before?

A. That question has arisen, yes.

Q. In those situations where that question has arisen, have there been times where there was higher than expected testosterone levels?

A. I can't think of a situation that that's been the case. The -- the puberty blockers that we're talking about, the injectable and the implant, work extremely well, which is why most of the time measuring testosterone isn't necessary. I think there's a difference in -- well, I would say that when I'm using GnRH agonists for precocious puberty, you know, sometimes it's -- it's -- I've been in the habit of measuring testosterone levels more in biologic males that have precocious puberty just because any exposure to testosterone would cause, you know, advancement of the bone age, the growth plates in the hand, but even in those situations the -- the mark -- the GnRH

agonists that are available on the market do an excellent job of suppressing puberty, and I haven't seen -- I can't remember patients that have had escape from suppression that's clinically meaningful.

Q. Is it your understanding, setting aside precocious puberty people, but for the patients with gender dysphoria who are receiving puberty blockers, for that set of patients is it your understanding that puberty blockers are 100 percent effective?

A. I don't think you can say that about any medication, but as -- in terms of how -- as far as medications go, they're very, very effective.

Q. So it's your understanding that there could be patients who receive puberty blockers that the blockers are not effective?

A. I mean, that's a hypothetical that -- that I can't disagree is possible, but it's not something that I have -- have seen in my practice.

Q. Puberty blockers are not approved by the Food and Drug Administration for use for people with gender dysphoria, are they?

A. It's not an approved indication, no.

Q. Because it's not an approved indication, use for patients with gender dysphoria, it's considered off label?

A. That's right.
Q. And because it's off label, does that mean that the FDA has not received a request to approve the use of puberty blockers for treatment of gender dysphoria?
A. Well, I think it would mean they haven't received a request or they've received a request and haven't approved the medication for that indication, but, to my knowledge, what you said is correct, they haven't received a request to -- by a drug manufacturing company to have gender dysphoria as an approved indication.

MR. SMITH: I'd like to mark what I believe will be Exhibit 9.

(Marked EXHIBIT 9 for identification)

BY MR. SMITH:
Q. Dr. Shumer, I've handed you Exhibit 9. Do you recognize Exhibit 9?
A. I don't think so.
Q. Have you ever seen Exhibit 9 before?
A. I don't think so.
Q. Is Exhibit 9's title "Commission on Human Medicines report into the safety implications of proposed puberty blockers legislation: factsheet"?
A. Yes. From the United Kingdom.
Q. Does this Exhibit 9 say it was published on the 24th

of January 2025?
A. Yes.
Q. Would that be approximately one month ago?
A. Yes.
Q. At the top left-hand corner of Exhibit 9 does it say "GOV.UK"?
A. Yes.
Q. Is it your practice to follow what developments are happening relating to puberty blockers or treatment of gender dysphoria around the world?
A. To some extent. I'm an American doctor and I belong to the Endocrine Society, and I try to stay up-to-date on -- on things published related to pediatric endocrinology and specifically to gender medica -- gender-affirming care, and I'm certainly familiar with many publications from around the world, but -- but I haven't seen this document yet from a month ago.
Q. And I think in your rebuttal report you talk about what's known as the Cass report; is that right?
A. Yes.
Q. You've seen that document?
A. Yes.
Q. Are you familiar with what the Commission on Human Medicines even is in the United Kingdom?
A. I don't have a lot of knowledge about what that means

in their health system, no.
Q. Besides the Cass report, have you studied what action the United Kingdom government is taking relating to puberty blockers?
A. I've -- I've tried to stay up to speed on it as much as I can. I don't know if I have all the most up-to-date information, but I think the answer is yes.
Q. It's something that interests you it sounds like?
A. Yes.
Q. Seeing Exhibit 9 in front of you, is that the type of document that would interest you as it comes to staying up to speed on what's happening around the world on puberty blockers?
A. Certainly something that I -- I would make myself aware of, yes. But I don't know if the Commission on Human Medicines from the United Kingdom is -- has an impact on my understanding of the body of literature related to these topics.
Q. I'd like to turn to Page 4 in this Exhibit 9.
A. Page 4?
Q. You see in the middle of Page 4 is a section called "Safety of prescribing puberty blockers"?
A. Yes.
Q. And you see the paragraph underneath that section says, "CHM have been clear in their view that the

current prescribing and care pathway for gonadotropin-releasing hormones (GnRH) agonists for gender incongruence and/or gender dysphoria in children represents an 'unacceptable safety risk'. That is why their first recommendation was that an indefinite ban on prescribing of these medicines for these purposes to patients under 18 should be enacted by ministers."

Did I read that correctly?

A. Yes.

Q. Is that a recommendation that you think you should find out more about?

A. I feel like I know a lot about it and disagree with it.

Q. Why do you disagree with it?

A. Because the safety and efficacy of GnRH agonists for the treatment of gender dysphoria have been studied. I understand the literature and believe that when appropriately prescribed can be extremely helpful, and so I don't believe that the -- that this statement comes from literature that I'm unaware of and disagree with the Commission on Human Medicine's interpretation of the literature as stated here.

Q. So you think that this part of the United Kingdom government got it wrong with this statement?

A. I don't know anything about what this commission is or how the commission interfaces with the government of the United Kingdom, but I can just tell you that I disagree with this statement.

Q. If we turn to Page 6 of Exhibit 9. You see at the bottom of the page is a section titled "Use of puberty blockers for other medical conditions"? Do you see that?

A. Yes.

Q. The first sentence under that section reads, "Both Baroness Cass . . ."

Is it your understanding that that would be the person for whom the Cass report is named?

A. I mean, that's an assumption that we can make together. I haven't read this before, and I assume that that's what they mean, but I have nothing else to direct my knowledge of that answer to that question.

Q. This paragraph on Page 6 reads, "Both Baroness Cass and the independent CHM found that there is a lack of evidence for the efficacy of these medicines in the treatment of gender incongruence and/or gender dysphoria, and that there is currently an unsafe prescribing environment."

Did I read that correctly?

A. You did.

Q. Do you agree or disagree with that statement?
A. I don't think that those are the words that Dr. Cass wrote. Dr. Cass's report didn't suggest banning the care -- banning the use of puberty blockers in the United Kingdom. That wasn't one of the recommendations. I'm not sure that she used the words "unsafe prescribing environment" to describe the prescribing environment in the United Kingdom. I'm also not as familiar with the prescribing environment in the United Kingdom. So with those caveats, I guess I can answer the question to say -- what was the question?
Q. I was just asking if you agreed or disagreed that there was a lack of evidence for the efficacy of these medicines and the treatment of gender incongruence and/or gender dysphoria.
A. No, I don't.
Q. And then if we were to turn to Page 11 of Exhibit 9. At the very bottom of the page you see a heading that says "Government response to consultation submissions."

Do you see that?

A. Yes.
Q. If we flip the page to Page 12. We see three different paragraphs. The last paragraph talks about

the Cass review. Do you see that?
A. Yes.
Q. The paragraph reads, "Separately, the Cass review was informed by a large range of sources, including extensive stakeholder engagement of over 1,000 individuals. It met regularly with support and advocacy organisations with a primary or significant goal of supporting gender-questioning young people, and found that there is a lack of evidence for the efficacy of these medicines in the treatment of gender incongruence and/or gender dysphoria."
Did I read that correctly?
A. Yes.
Q. Did you know that about the Cass review about its stakeholder engagement efforts?
A. The -- there's a -- you know, this is a description of the Cass report. It's a description of itself. I've read the Cass report, and so I -- I do have an understanding of the process that they used, yes.
Q. Does this document, Exhibit 9, change any of your opinions in this case relating to puberty blockers or the treatment of gender dysphoria?
A. The opinion that puberty blockers can be used safely and effectively for the treatment of gender dysphoria? No, it doesn't.

MR. SMITH: We've been going right about an hour. This is a good time for a break. Let's go off the record.

VIDEO TECHNICIAN: Going off the video record. The time is now 1:28 p.m.

(Recess taken at 1:28 p.m.)

(Back on the record at 1:34 p.m.)

VIDEO TECHNICIAN: Back on the video record. The time is now 1:34 p.m.

BY MR. SMITH:

Q. Dr. Shumer, we've been talking about gender dysphoria and treatment for gender dysphoria. If we return to Exhibit 1, which is your report in this case. Do you have Exhibit 1 still in front of you?

If we look at Page 6 of your report, Exhibit 1, you see the "Medical and Scientific Background on Gender Identity and Gender Dysphoria" section?

A. Yes.

Q. If we flip the page to Page 7. On this page I don't see any footnotes or scientific citations. Do you see any?

A. No.

Q. So is Page 7 all your work?

MS. BERG: Objection. Vague.

A. It's -- it's written without citation, but, you know, the fact that the, for example, American Academy of Pediatrics, American Medical Association, and American Psychiatric Association and other organizations have denounced what I describe as curing transgender individuals by forcing their gender identity into alignment with their birth sex are harmful and effective, I didn't -- you know, I didn't derive that from my own brain. I read resources that I didn't cite in this particular declaration.

BY MR. SMITH:

Q. So if I understood you correctly, you read different sources, you distilled it into your own words and then wrote that here on Page 7?

A. Correct.

Q. Is that the same case on Page 8? There's some references, for example, in Paragraph 26 to the DSM-5-TR and the World Health Organization's International Classification of Diseases. So those are sources that you may have read and then again here on Page 8 distilled down into your own words?

A. Yes.

Q. Continuing on onto Page 9. We see Footnote 2. It has a lot of citations. Just so I understand Paragraph 28, did any of those sentences come from one

of the sources in Footnote 2 or did they -- those sentences in Paragraph 28 come from you with citations in Footnote 2?

A. The latter.

Q. Okay. And then on Page 10, again, I see references to different organizations in Paragraphs 29, 30, and 31. Are those examples of organizations that, you know, you had consulted and then distilled down into your own words here on Page 10?

A. Correct.

Q. And then Page 11, I don't see any organizations or citations, but are the different organizations that we read on previous pages examples of places that you may have consulted for the words that you used here on Page 11?

A. Yes.

Q. Let's talk sports, then, that begins on the bottom of Page 11.

Do you have a degree in sports science, Dr. Shumer?

A. No.

Q. Have you published any peer-reviewed articles on sports science?

A. No.

Q. Have you conducted any primary research into topics

involved in sports science?
A. Not specifically.
Q. Do you have a degree in exercise science?
A. No.
Q. Have you published any peer-reviewed articles on exercise science?
A. No.
Q. Have you conducted any primary research on exercise science?
A. No.
Q. Do you have a degree in kinesiology?
A. I don't.
Q. Have you published any peer-reviewed articles on kinesiology?
A. No.
Q. Have you conducted any primary research on kinesiology?
A. No.
Q. Do you have a degree in athletic training?
A. No.
Q. Have you published any peer-reviewed articles on athletic training?
A. No.
Q. Have you conducted any primary research on athletic training?

A. I have not.
Q. Do you have a degree in physical education?
A. No.
Q. Have you published any peer-reviewed articles on physical education?
A. No.
Q. Have you conducted any primary research on physical education?
A. No.
Q. When we were talking sports science, among those four topics, you said not specifically when I asked if you conducted any primary research on sports science. Have you conducted some form of research on sports science?
A. I think I answered that differently just because I felt like that was the closest to overlapping with the reason that I am an expert in this case, which is my understanding of puberty and the physiology of puberty and how puberty changes the body and by extension how cumulative exposure to testosterone over time causes differences in athletic performance amongst males and females. So I -- I answered that question in the negative, but I think you sensed my hesitation a little bit more with that question for the reason I just described.

Q. I appreciate that response.

Have you taken any formal classes in your education on sports science?

A. I -- I believe that when I was a pediatrics resident I did. I think there was some, you know, didactic sessions on the pediatrician and -- and sports medicine that I participated in just as a pediatric resident. One of the residents in my pediatrics program was the -- was the trainer for the high school football team and I shadowed him a couple times, but that's the closest I'm getting to something related to the answer to your question.

Q. It sounds like it wasn't a formal course in any part of your formal education; is that fair? Sports science?

A. Correct.

Q. And when you said that you may have had a session on pediatric medicine and its interaction with sports medicine, about how long would that session have lasted?

A. A couple hours.

Q. Have you taken any classes in your formal education on exercise science?

A. No.

Q. Have you taken any classes in your formal education on

kinesiology?
A. No.
Q. Have you taken any classes in your formal education on physical education?
A. No.
Q. Have you taken any classes in your formal education on exercise physiology?
A. No.
Q. Have you taken any classes in your formal education on biomechanics?
A. So I'm -- I'm fairly certain that in the musculoskeletal section in med school there was, you know, lectures related to mechanics of -- of leverage and musculature and things of that sort, so I do think that's, you know, a formal part of the medical school curriculum, but not beyond what every other medical student would have received.
Q. Do you think that was a component of one of your classes?
A. Yes.
Q. It wasn't the entire class?
A. Correct.
Q. Have you taken any classes, any formal education on motor control?
A. No.

Q. Have you taken any classes in formal education on sports psychology?
A. No.
Q. Are you a psychiatrist?
A. I am not.
Q. Are you a psychologist?
A. No.
Q. Have you competed in the Olympics?
A. No.
Q. Have you ever competed at elite levels?
MS. BERG: Objection. Vague.
A. I -- I haven't competed in sports beyond high school.
BY MR. SMITH:
Q. Have you ever coached athletes who were training for the Olympics or for professional sports?
A. No.
Q. Have you ever coached athletics at all?
A. I coached my son's soccer team when they were elementary age.
Q. Was this a recreational soccer team?
A. Yes.
Q. Approximately what ages?
A. Six.
Q. Do you remember if it was a co-ed or a single sex league?

A. In our -- in our public school district there's options for male, female, or mixed, and I signed him up for the male league. You can sign up for any of the three that -- that you -- that you'd like, and I signed him up for the male league because that was his -- his friends were playing in that league.
Q. So you don't have experience coaching girls sports?
A. No.
Q. Would you consider yourself an expert in the field of sports participation?
A. No.
Q. Would you consider yourself an expert in the field of track and field participation?
A. No.
Q. Would you consider yourself an expert on the topic of volleyball?
A. No.
Q. Would you consider yourself an expert on the topic of basketball?
A. No.
Q. Would you consider yourself an expert on the topic of cross-country?
A. No.
Q. Would you consider yourself an expert on what constitutes an unfair competitive advantage in sports?

A. No.
Q. So if we look at Exhibit 1, Pages 11 and 12 contain the paragraphs for your section on "Sports and Gender"; is that right?
A. I'm sorry. Say that again.
Q. Pages 11 and 12 contain your paragraphs under the subheading "Sports and Gender"?
A. Yes.
Q. In these paragraphs on Pages 11 and 12, am I correct that you cite only a single source in Footnote 3, an article by David J. Handelsman?
A. Yes.
Q. You don't cite any other journal articles in your "Sports and Gender" section?
A. I did not in this initial declaration, no.
Q. You don't cite any rules by athletic organizations in your "Sports and Gender" section?
A. I did not.
Q. Just a single citation in Footnote 3 is all that you used to support your opinions on "Sports and Gender"?
A. In this declaration, yes.
Q. And you understood that you were providing your opinions and all the necessary support for those opinions in this report; right?
A. That was my attempt.

Q. Have you published on the prepubertal differences between natal boys and girls, Dr. Shumer?
A. No.
Q. Have you conducted research in the area of prepubertal differences between natal boys and girls?
A. No.
Q. Have you published any articles regarding the effects of exclusion from support -- from sports at any age of adolescence?
A. No.
Q. Are you aware of any studies regarding the effects of exclusion from sports that support your expert opinion?
A. No. I'm not -- I don't have -- I'm not presenting any expertise in inclusion or exclusion from sports. I'm not an expert on a body of literature related to that, no.
Q. Are you aware of any studies showing that preventing transgender youth from participating in sports because of their gender identity causes mental distress?
A. Am I aware of studies to that effect?
Q. Yes. Specifically in the sports context.
A. I don't think that I have specific knowledge of literature pertaining to that question, no.
Q. Have you in your practice at the CAGS clinic ever

forced someone to play sports as part of their treatment for gender dysphoria?

A. That doesn't sound like it would be a treatment for anyone's gender dysphoria, but . . . So no.

Q. You don't think sports would be a treatment for anyone's gender dysphoria?

A. Forcing someone to play a sport that they didn't want to participate in would not be a treatment for gender dysphoria. Helping to encourage participation in -- in areas of -- of activity that are meaningful to the person could be a part of a treatment plan for gender dysphoria. Certainly.

Q. Does the Endocrine Society have standards of care for gender dysphoria relating to sports?

A. No.

Q. Does the Endocrine Society have standards of care relating to sports participation for treatment of gender dysphoria?

A. No.

Q. How about WPATH? Does WPATH have standards of care for gender dysphoria relating to sports or sports participation?

A. I don't think so explicitly, no. I think that these organizations, you know, in describing support for folks that have made social transition, you know,

have -- have, you know, recommendations of helping to -- helping people feel included in -- in all areas of -- of their life, but I don't think specifically to the question you're asking, no.

Q. Are you aware of any organization like WPATH or the Endocrine Society that has a standard of care for treatment of gender dysphoria relating to sports participation?

A. No.

Q. In the absence of that standard, would a transgender girl participating on a co-ed sports team conflict with any standard of care for treating gender dysphoria in adolescents?

A. I think that it's really -- so, you know, I'm saying that there's no explicit provision around, you know, sports as a treatment for gender dysphoria, but yet there's, you know, a more broad understanding that helping a young person to live as authentically as possible as their affirmed gender helps with mental health and quality of life, so how I think about your question, you know, is if there was a situation where a trans girl was not wanting to participate on a co-ed team, then participating on the co-ed team wouldn't be part of her care treatment. But sort of beyond all of this, you know, I don't necessarily have a specific

area of expertise in telling you that in general all trans girls do better playing sports on girls teams but rather have expertise on the effect of puberty on the body of people going through puberty, including trans girls.

So, you know, certainly in my role as a doctor of a patient who wants to participate on a girls team, if there was a need to outline their medical treatment to allow her to participate, I would be more than happy to do that if it meant that she had the potential to play, but the decision about whether her medical history allowed her to play is something that I wouldn't have control over.

Q. You said a lot there. I'm not sure I quite heard the answer to my question, so let me try again.

Would a transgender girl participating on a co-ed team conflict with the standards of care for treating gender dysphoria in adolescents?

A. I'm not -- I guess I'm really not sure how -- maybe you can frame it as an example or . . . I don't understand how playing on a co-ed team would conflict with standards of care if that was something that she wanted to do, and if it wasn't something that she wanted to do, then she wouldn't play, so I guess I'm not sure how to answer your question.

Q. So let me phrase it in the terminology you just used. If a transgender girl with gender dysphoria wants to play on a co-ed team, would playing on that co-ed team conflict with any standard of care for treating gender dysphoria?
A. No.
Q. And if a transgender girl wants to play on a girls club team, would that conflict with any standard of care for treating gender dysphoria?
A. No.
Q. And if a transgender girl wants to play on a girls recreational team, would that conflict with any standard of care for treating gender dysphoria?
A. No.
Q. And, as I think you were also saying, if a transgender girl doesn't want to play on any of those teams, not participating also wouldn't conflict with any standard of care for treating gender dysphoria; right?
A. Correct.
Q. Have you conducted any primary research on transgender youth with gender dysphoria who want to play in school sports?
A. No.
Q. Have you published any peer-reviewed articles on transgender youth with gender dysphoria who want to

play school sports?
A. No.
Q. Are you aware of any such peer-reviewed articles out there?
A. I'm not aware of articles saying, oh, this is a group of transgender youth that the intervention is sports participation and here's the positive or negative outcome. I'm not aware of any studies like that, no.
Q. Have any of your patients at the CAGS clinic ever reported to you that they were suffering mental distress because of not being allowed to participate in school sports?
A. Well, that hasn't been a problem where I live, but I have a few patients that do participate in sports that find it very meaningful for them and have expressed concern about whether or not they'll continue to participate in the sport that they love to play, but I haven't had the scenario that you're envisioning because we haven't had a similar law passed in -- in the state that I live in.
Q. You've seen patients from states outside of Michigan, though; right?
A. Yes.
Q. And do you know if you've seen patients from states that have laws restricting sports participation on the

basis of sex?
A. I do not know the -- I imagine that it's probable that that's the case, but I haven't had -- I haven't been confronted with the scenario that you outlined where someone has wanted to play sports and then was not allowed to.
Q. Has it come up in your practice at the CAGS clinic before?
A. That specific scenario has not, no.
Q. Is there any circumstance in which an adolescent experiencing gender dysphoria should play the sport of their birth sex?
A. So I think that that would be a really individualized question. I could imagine a scenario that that would be true. Sure.
Q. What scenario can you imagine that would make it better for an adolescent experiencing gender dysphoria to play the sport of their birth sex?
MS. BERG: Objection. Vague.
A. A hypothetical scenario would be someone who is, you know, a teenage person that's assigned male at birth that identifies as female who is experiencing gender dysphoria but not -- not out to peers, not on medications, and has found value in participating in sports and wants to continue playing -- wants to

continue playing sports. I feel like that would be an example of what you're describing. That also hasn't come up, but if I'm just trying to imagine a scenario, that could be -- that could be one.

BY MR. SMITH:

Q. As we look at your Exhibit 1, in your sports section, Paragraph 37, you talk about the role that testosterone plays in your opinion; is that right?

A. Yes.

Q. And in the previous paragraph you talk about performance levels both pre and post puberty in Paragraph 36. Do you see that?

A. Yes.

Q. In Paragraph 36 the first sentence reads, "Before puberty, girls and boys generally perform at the same level with small differences at the margins (some favoring boys, some favoring girls)."

Did I read that correctly?

A. Yes.

Q. What resources is that sentence based on?

A. So there's -- there's population studies on different -- different measurables that prepubertal boys and girls have -- have been measured doing different -- various athletic activities. In some of those there's no difference between the groups and

some there's discrete activities favoring boys or girls, but then in my sort of review of the literature on the topic there isn't a -- there isn't a scientific conclusion to suggest that biologic differences between males and females is the driver of any differences in athletic performance before puberty.

Q. Did you cite any of those sources that you just mentioned in Paragraph 36?

A. I did not.

Q. Do you remember the names of any of the authors of the articles that you just mentioned?

A. Well, the article that I did cite by Handelsman I think reviews some of this material as a review article, but the individual articles beyond that, no.

MR. SMITH: I'm going to mark Exhibit 10. I think we're on Exhibit 10.

(Marked EXHIBIT 10 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you what we've marked as Exhibit 10; is that right?

A. Yes.

Q. Do you recognize Exhibit 10?

A. Yes.

Q. What is Exhibit 10?

A. This is a declaration that I wrote in support of the

motion for the preliminary injunction which was -- sorry. I'm just trying to get all these reports straight in my head about which came when and why. So this was a report written before the report that we've been reading or using as Exhibit 1 at the earlier -- an earlier stage of this proceeding.

Q. If we turn to Page 12 of what we marked as Exhibit 10. Was this declaration dated April 4th, 2023?

A. Yes.

Q. Is that your signature on Page 12?

A. Yes.

Q. Does this appear to be a fair and accurate copy of the declaration that you submitted in this case?

A. Yes.

Q. Does this help clear up some of the dates that we were talking about early on in this deposition?

A. Yes. Thank you. So it seems like I was probably approached in early 2023, which I said the first time before I corrected myself, but yes, that helps.

Q. Talked yourself out of the right answer.

A. Yeah. Yeah.

Q. I'd like to look in Exhibit 10 at Paragraph 38. And this paragraph, the first sentence reads, "Before puberty. There are no significant differences in athletic performance between boys and girls."

Did I read that correctly?

A. Yes.

Q. And we just looked in Paragraph 36 on Exhibit 1 at that comparable sentence. What changed in your expert understanding between Exhibit 10 and Exhibit 1 for this sentence?

A. Well, I think I'm trying to be more precise in the second declaration because, you know, it can be true that there's group differences in performance that are due to unknown reasons or non-biologic reasons. To say that there's no differences in athletic performance between boys and girls I don't think is specific enough. So, for example, if, you know, hypothetically a group -- boys are exposed to participation in sports at a higher rate than girls, that could be a driver of differences between prepubertal boys and girls that would be unrelated to biology, and in some -- in some instances there's discrete activities where that -- that may be true. I think that -- that there's, you know, again, not -- there's not evidence to support the notion that there's biologic differences in sports performance in prepuberty, but that doesn't -- that doesn't necessarily mean that there haven't -- there can't be measurable differences in activities between groups of

boys and girls, and so I think that -- for that reason the second time I wrote that sentence I tried to be more clear.

Q. Looking at the second time you wrote that sentence in Exhibit 1, what is your understanding of prepubertal boys having advantages over prepubertal girls?

MS. BERG: Objection. Vague.

BY MR. SMITH:

Q. We're in Exhibit 1 at Paragraph 36 just to reorient you.

A. Thank you.

Q. So your last answer, which is supported by this sentence says that there are occasions when there are small differences at the margins, some favoring boys.

What are those instances when boys have an advantage over girls prepuberty?

A. Well, I don't know that I can say with a blanket statement any specific thing. You know, I think that the -- for example, the -- some of the defense experts have presented data showing, you know, differences in top performers in different activities. So that's something that -- that, you know, exists in the -- in the -- in the public domain. Those aren't necessarily studies that are trying to isolate biologic differences between boys and girls but is an example

of, you know, something that has demonstrated a difference that was highlighted by the defense experts.

Q. So can you remember any instances from your review of the defense experts or other literature when prepuberty boys have some sort of advantage over prepuberty girls?

A. Well, I don't think I would frame it like prepubertal boys have an advantage over prepubertal girls. Just in discrete areas of measurement there's been better performances by groups of boys over girls. So I wouldn't call that a competitive advantage based on biology, and I don't have an example of that.

Q. An example of those discrete areas of measurement that you just mentioned, you don't have examples of when boys have -- are -- when those measurements favor boys over girls?

MS. BERG: Objection. Asked and answered.

A. Yeah. That's a sort of a different way of asking the question. So I didn't agree with it the first time. But, you know, there's -- you know, I recall the defense experts providing, you know, data of, you know, the best performances in different events and demonstrating that the scores were higher in certain ages of prepubertal boys than girls and others where

girls were better than boys, and so that's an example of something that has been -- boys have measured higher, but not an example of a competitive advantage if I'm sort of trying to parse the two questions that you asked.

BY MR. SMITH:

Q. The next sentence in Exhibit 1, Paragraph 36, reads, "In contrast, post-pubertal boys as a group generally begin to show a significant athletic advantage over post-pubertal girls due to their exposure over time to the elevated levels of testosterone associated with male puberty."

Did I read that correctly?

A. We're on Exhibit 1; is that right?

Q. Yes.

A. Yes. You read that correctly.

Q. You didn't cite any journal articles or peer-reviewed literature to support that statement, did you?

A. No.

Q. Are you aware of anything other than the Handelsman article that supports that statement?

A. I think as I wrote that statement, I was relying on my expertise as a pediatric endocrinologist and my understanding of normal puberty physiology. So I don't have -- I wasn't relying on a specific

scientific article, no.
Q. In Paragraph 37 of Exhibit 1 the first sentence reads that "The biological driver of these average group differences is testosterone, not anatomy or genetics."
Did I read that correctly?
A. Yes.
Q. Do you have support for that sentence in journal articles other than the Handelsman article in Footnote 3?
A. No.
Q. When you say the biological driver, does that mean that testosterone is the only biological factor that causes the average group differences in sports?
A. Are you talking about between biologic males and females specifically?
Q. Yes.
A. So I would say that testosterone -- so testosterone is the initial biologic driver that sets the stage for other changes that also can become their own independent drivers of change but that the basis is testosterone.
Q. What are the other biological factors that may play a role?
A. So, for example, you know, average group differences in adult men versus adult women in musculature. You

know, increased musculature could be a driver of competitive advantage, but the baseline reason for that difference in musculature is the testosterone differences and the cumulative testosterone exposure over time to the muscle, so that's sort of an example of what I was trying to describe.

Q. Paragraph 37 talks about testosterone after puberty. It doesn't talk before puberty. What are the testosterone levels between boys and girls like before puberty?

A. So in -- in prepubertal children, both boys and girls have -- are not making testosterone.

Q. Does that mean they both have levels of zero on testosterone prepuberty?

A. So it's close to zero. I think that the gonads themselves aren't producing testosterone. There's another part of the body called the adrenal glands that can make some androgens that can get converted to testosterone. But I would suggest that there's no significant measurable differences in the very low amounts of testosterone between prepubertal boys and girls during childhood.

Q. I'd like to go to an exhibit we had before. I believe it's Exhibit Number 5. Since this, again, doesn't have page numbers, we'll flip through together. I

counted 21 pages back, a chart that says "Sex Differences in Testosterone." Do you have that slide before you?

A. Yep.

Q. You see a graph there on the slide. Do you know who prepared that graph?

A. I don't recall where I copied this from, no.

Q. On this graph there are two different lines on a chart that's titled "Sex Differences in Testosterone." Do you see those lines?

A. Yes.

Q. The top line, is that boy or girl?

A. Yeah. It's male.

Q. Male? And the bottom line, is that female?

A. Yes.

Q. On this graph that you had in your 2017 presentation, is the male line testosterone above or below the female line at all points in this graph?

A. Yeah. That's how it's depicted, but, you know --

Q. How is it depicted?

A. It's depicted that the male and female points start together, that in fetal life there's a difference. There's a difference right after birth, which is what is referred to as the minipuberty of infancy. And then, you know, this is -- it's not drawn to scale or,

you know, accurate to the level of detail that we need to be talking about today, but the line continues to be above that of the female line. I didn't -- I didn't make this picture, but I assume that's to keep the lines separated so you can tell which one is which later on. But I -- I would reaffirm the idea that -- that when you asked about childhood that there's not significant or measurable differences and the level of testosterone is -- is close to zero for all children. You know, in infancy there's a difference. In fetal life there's a difference. But not -- not in childhood.

Q. And then this large spike that we see on the male line, is that reflective of when puberty occurs in the average male?

A. Yes.

Q. And so it's your opinion that after this spike is when there begins to be a competitive advantage between males and females playing sports?

A. Well, I would say that there is a competitive advantage that develops over time with the cumulative exposure to testosterone with boys going through puberty.

Q. You say it develops over time. How long are we talking about on average?

A. So I think that it's hard for me to answer that question given the fact that puberty looks different for every person. I'm also not feeling like I'm an expert in what constitutes, you know, a significant competitive advantage. You know, in the case of the plaintiffs in our case here, you know, they didn't go through puberty, so my -- that's why I am claiming that they have no competitive advantage, but what constitutes an advantage I think is, you know, probably different for each sport, different for other factors that are outside of my area of expertise.

Q. So what constitutes an advantage in sports isn't something that you're trying to present an expert opinion about?

MS. BERG: Object. Misphrases the testimony.

A. I just don't feel comfortable drawing a line somewhere and saying that's what constitutes an unfair competitive advantage, but I can provide expertise on the fact that the plaintiffs don't have a competitive advantage.

BY MR. SMITH:

Q. How would you define competitive advantage?

A. Well, I can say that -- I can say that postpubertal men in general are larger and stronger than

postpubertal women who have gone through normal male and female puberty and that there's -- as a pediatric endocrinologist I understand that the differences are -- are driven by cumulative exposure to testosterone over time. As a layperson I can understand that there's a competitive advantage obtained by being bigger and stronger and that in the absence of masculinizing puberty there isn't a competitive advantage. I can tell you about averages in terms of what consist -- what is considered normal and abnormal puberty, but -- so I think to answer your question, you know, the fact that a competitive advantage exists between men and women, I agree to, but that what constitutes an unfair advantage or a significant advantage for each sport I don't have an expert opinion in.

Q. Do your opinions as it relates to testosterone largely depend on the Handelsman article cited in Footnote 3 of Exhibit 1?

A. I think that and my clinical experience and understanding of puberty and development.

Q. You say you also are relying on your own experience. Have you observed any of your patients playing school sports?

A. I was meaning my experience on changes that happen

during puberty and the impact of medical interventions on that but don't claim to be an expert on sports performance, no.

Q. And back to my question. Have you observed any of your patients playing sports?

A. I don't think so.

Q. Have you timed any of your patients running?

A. No.

Q. Have you measured the muscle mass of any of your patients?

A. No.

Q. Have you seen how far your patients can jump over time?

A. I have not.

Q. Have you tested their grip strengths of any of your patients?

A. Not outside of like a normal neurologic exam, no.

Q. So when you say you're an expert on the effects of puberty, are you an expert on any of the changes that happen in muscles or strength or speed that would affect sports performance?

A. You know, I would say that I am an expert on body -- body changes and body composition changes over time with respect to puberty. Extrapolating those to how each of those changes impact sports performance in

various sports, no.
Q. And when you say you're an expert on body changes during puberty, it sounds like that's mostly based on observation since you're not measuring muscles or speed or strength; is that fair?
A. I'm not engaged in specific research related to those topics, no. But I -- I'm -- part of the training of becoming a pediatric endocrinologist is understanding puberty and muscular changes in a way that's, you know, different from a primary care doctor observing patients going through puberty and observing that their muscles are changing. So I do have -- I -- I guess I'm reaffirming the idea that I do have expertise in puberty and its effects on the body more than a general pediatrician as -- as puberty and growth and development is -- is within the purview of pediatric endocrinology, but not extrapolating that to how those changes and each of those changes affect sports performance in specific ways.
Q. Do you conduct physical exams on your patients at every visit?
A. Yes.
Q. What does that physical exam consist of?
A. It would be different depending on the reason for the visit and the -- the concerns that are raised. So

generally it would involve a description of their general appearance, their rundown of an exam of their eyes, nose, mouth, throat, thyroid, general muscular tone, heart, lungs, and abdomen. If there was concerns with regards to the genitals or chest, that would be part of the exam. And a note of their psychiatric exam.

Q. Do you ever see patients by Zoom?

A. Sometimes.

Q. How do you conduct a physical exam by Zoom?

A. It's more limited in that situation, so it would be more of a -- the exam would consist of a general -- general appearance exam, psychiatric exam, and -- and would be missing some of the exam that would require one-on-one obser -- in-person observation.

Q. What percentage of your patients do you see by Zoom?

A. About a fifth. All of the patients come in person at least for some of their visits, but then one half day a week I have virtual clinic and use that for patients that it makes sense that -- that a video visit would accomplish the goals of whatever that visit is.

Q. For that one-fifth of visits that are conducted by Zoom, you can't do the full physical exam for those visits, can you?

MS. BERG: Objection. Asked and answered.

A. I would perform the physical exam. As I described, it would be different than the physical exam that would be possible in person, yes.

MR. SMITH: I'd like to mark the Handelsman article as Exhibit 11.

(Marked EXHIBIT 11 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you Exhibit 11. Do you recognize Exhibit 11?

A. Yes.

Q. What is Exhibit 11?

A. I just want to confirm that it's the same.

Yeah. Okay. This is the article that was cited in my second report.

Q. It's Footnote 3's article in Exhibit 1?

A. Yes.

Q. Does Exhibit 11 appear to be a fair and accurate copy of the article that you've relied on in Footnote 3 of Exhibit 1?

A. Yes.

Q. Dr. Shumer, do you consider Exhibit 11 to be a form of primary research or secondary research?

A. Secondary.

Q. What does secondary research mean?

A. It means that Handelsman is reviewing articles done by

others to form his conclusions.
Q. Does that mean there is no like original primary research contained in Exhibit 11?
A. I believe -- I don't believe there is, no.
Q. I'd like to look on the very first page numbered 803. The very first paragraph of the article's text, the first two sentences read, "Virtually all elite sports are segregated into male and female competitions. The main justification is to allow women a chance to win, as women have major disadvantages against men who are, on average, taller, stronger, and faster and have greater endurance due to their larger, stronger muscles and bones as well as a higher circulating hemoglobin level."

Did I read that correctly?
A. Yes.
Q. Do you agree with that statement?
A. Yes.
Q. Based on that statement, do you think that there is at some point when it's appropriate to separate men and women on the basis of sex in sports?
A. Yes. I agree with that. I think that, as it's not necessarily my area of expertise, I feel like I'm providing that answer more as a layperson, but to that extent, yes.

Q. So you don't have an expert opinion on when the right time is to separate on the basis of sex in sports; is that right?
A. Correct.
Q. On Page 804, the next page in this article, on the right-hand side the first paragraph that you see says, "The terms sex and gender are often confused and used as if interchangeable."
Do you see that?
A. Yes.
Q. There's then a discussion that follows on the definitions of sex and gender. Do you agree with Dr. Handelsman's definitions for sex and gender in this article?
A. I mean, for reasons that we discussed earlier today, I -- I wouldn't provide exactly the same definitions. I think some of what -- these are two long paragraphs that are definitions, so I wouldn't necessarily agree with every word therein, but the fact that those are two different terms, I agree.
Q. The last two sentences in this paragraph on Page 804 on the bottom right-hand side read, "For example, if gender were the basis for eligibility for female sports, an athlete could conceivably be eligible to compete at the same Olympics in both female and male

events. These features render the unassailable personal assertion of gender identity incapable of forming a fair, consistent sex classification in elite sports."

Did I read that correctly?

A. Yes.

Q. And do you have expert opinions that you've formed on what is a fair, consistent sex classification for elite sports or sports at any level?

A. No.

Q. So do you have any opinion on Dr. Handelsman's statement here on Page 804 in your expert capacity?

A. I guess I don't understand the first sentence, to be honest, how an athlete could be eligible to compete at the same Olympics in both female and male events. But I think the answer to your question is no, I don't have an expert opinion.

Q. On Page 805, the following page, the first paragraph at the top left talks about justifications for sex classification in elite sports. The third and fourth sentences read as follows: "The striking male postpubertal increase in circulating testosterone provides a major, ongoing, cumulative, and durable physical advantage in sporting contests by creating larger and stronger bones, greater muscle mass and

strength, and higher circulating hemoglobin as well as possible psychological (behavioral) differences. In concert, these render women, on average, unable to compete effectively against men in power-based or endurance-based sports."

Did I read that correctly?

A. Yes.

Q. Do you agree with that statement by Professor Handelsman?

A. Generally, I guess, with a few question marks. You know, I think that the word "durable" to me means like can't be -- can't be reversed in any way, and so I think that perhaps outside of the scope of the question, you know, I'm not sure that -- maybe that's a little bit of a strong word for this sentence, in my opinion. I don't have expertise in -- in what he's describing as possible psychological behavioral differences and testosterone as it relates to sports performance. Otherwise I don't have any issues with the two sentences.

Q. If we flip forward to Page 812. There's a section on the bottom left that begins "Observational data."

A. Yes.

Q. Without reading the parenthesis citations, it says, "There is a clear sex difference in both muscle mass

and strength even adjusting for sex differences in height and weight."

Did I read that correctly?

A. Yes.

Q. Do you agree with that statement in this Handelsman article?

A. That -- that sentence is so vague and out of context. With -- without me reading the surrounding materials, I guess I'm not sure.

Q. Well, you've read this article before; right?

A. Yes.

Q. And the surrounding material that follows goes through what those differences are in muscle mass and strength; right?

A. Yeah. I guess I would just prefer to read the entire paragraph to myself before answering.

Yes. So that helped me to remember that, you know, he's talking about the differences in adult women compared to adult men and mentioning that at the end of that paragraph the major cause of sex differences in muscle mass and strength is the sex difference in circulating testosterone, and I don't have any reason to dispute that paragraph.

Q. And is that -- circulating testosterone, that's the basis for your expert opinion on sports in this case;

right?
A. Well, I guess that was one of the pieces of my expert report.
Q. And so if we flip to Page 813, the following page, you see Figure 1 on this page; right?
A. 813?
Q. 813. Top of the page it says Figure 1.
A. Yeah.
Q. And Figure 1 has three different graphs, one for running, one for jumping, and one for fitted curves; right?
A. Yes.
Q. The -- the axis at the bottom of each of these, the X axis, is an "Age (years)"; right?
A. Yes.
Q. And the years go from 10 to 19 in all of these graphs; right?
A. Yes.
Q. Do you consider 10 to be prepubertal?
A. Not necessarily.
Q. Do you consider 11 to be prepubertal?
A. Well, normal puberty starts within a range of 8 to 13, so not -- some people that are 10 are prepubertal and others are not.
Q. So does Figure 1 on Page 813 contain any exclusively

prepubertal data on either boys or girls?
A. I wouldn't say that it does, no.
Q. Looking at the far left-hand side of each of these three graphs on Figure 1 at age 10, you see the Y axis is gender difference percentage for all three of these charts; right?
A. Yes.
Q. And in all three of these charts there was a gender difference in running, jumping, and the fitted curves; correct?
A. Yes.
Q. And so that means based on the -- the text and the description to Figure 1 that in these charts that boys had a difference over girls in all three of these charts; right?
A. Can you say that one more time? I'm sorry.
Q. All three of these charts, running, jumping, and the fitted curves, detected a difference which boys had an advantage over girls even at age 10; right?
A. Well, I guess I'd have to dive in to understand if there's a statistically significant difference, so I don't know if there's a difference at age 10. You know, it's a -- the line starts above zero for all of them. So -- so -- so that's true. But whether that's a statistically significant difference or a meaningful

difference, I don't know. I think that the author is -- is noting how the difference rises with exposure to testosterone. Whether or not the -- the initial difference is in part due to the fact that some of those kids are pubertal at age 10 or other environmental factors that are causing a difference or whether that difference is statistically significant or not I think is. Is hard to know from these -- these three graphs.

Q. So you're relying on the phrase "statistically significant." Do you have an expert opinion of what is statistically significant in competitive sports?

A. I guess I'm not talking about statistically significant in competitive sports. I'm talking about just data. So you can -- if you do -- if you compare -- if you take a hundred marbles, 50 of them are blue and 50 of them are red, and you grab ten of them, if you get two blue ones and ten red ones, that's different, but it might not be statistically significantly different because you would need a much larger sample to know if there's more blue or red. So that's just a math term that a statistician uses to understand whether a measured difference is actually -- actually suggests that there is a real difference, and that's a different question for

whether that statistically significant or not statistically significant difference has meaning when it comes to sports.

Q. Do you know what the sample size was for the Handelsman article in Exhibit 11?

A. I don't right now. I'd have to go back to the primary article to -- to learn.

Q. And if I understood you, since you don't know the sample size, that's why you're saying you don't know if these differences are statistically significant?

A. I don't. But then I also know that the conclusion that Handelsman is making from review of all of the literature on this topic, which the second line of the abstract is "Prior to puberty, there is no sex difference in circulating testosterone concentrations or athletic performance, but from puberty onward a clear sex difference in athletic performance emerges as circulating testosterone concentrations rise," et cetera, et cetera.

Q. And I see that in the abstract, and I guess I'm curious where in this article you see there -- it being in your report of prepubertal data on athletic performance.

A. So it's not in this picture.

Q. Is it anywhere in the report, data that for kids that

you would consider prepuberty?
A. So I don't think that Handelsman proves in this article that there's no difference in prepubertal children with data. I think that the -- that the -- I guess I -- I'm saying this with maybe less certainty, but I think that the -- that there's -- there's no -- there's no evidence to support the conclusion that biologic differences drive differences in athletic advantage in prepuberty, but that's a different statement from proving that there's no biologic driver of competitive advantage before puberty, so I think that would -- that may be hard to prove, but there's no evidence to suggest or support that that's true.
Q. I guess what I'm asking is, in this abstract sentence that you just read what support you see in the article for the statement prior to puberty there is no sex difference in circulating testosterone concentrations for athletic performance.
A. If there's specific data to that specific question in here, I'm not finding it readily and I don't want to waste too much of the -- of your time, but I don't have -- I don't have something to point you to in this article to -- to answer your question.
Q. So closing out our questions on this article, back on Figure 1 on Page 813, in those three charts, running,

jumping, and fitted curves, which includes both running, jumping, and swimming, in none of these graphs do girls have an advantage over boys; is that right?

A. That's right.

Q. And in none of these three graphs in Figure 1 on Page 813 is the gender difference percentage in the Y axis equal to zero?

A. Correct.

MR. SMITH: Let's take a break and go off the record.

VIDEO TECHNICIAN: Going off video record. The time is 2:42 p.m.

(Recess taken at 2:42 p.m.)

(Back on the record at 2:52 p.m.)

VIDEO TECHNICIAN: Back on the video record. The time is now 2:52 p.m.

BY MR. SMITH:

Q. Dr. Shumer, we were talking about literature before we took our break. I'd like to show you some more articles.

MR. SMITH: I'll mark this as Exhibit Number 12.

(Marked EXHIBIT 12 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you what's been marked as Exhibit 12. Do you recognize Exhibit 12?
A. I have seen this before, yes.
Q. What is Exhibit 12?
A. It's an article titled "Evidence on sex differences in sports performance."
Q. Does this Exhibit 12 appear to be a fair and accurate copy of the journal article that you've seen before?
A. Yes.
Q. Was this article first published on the top of Exhibit 12 December 24th, 2024?
A. Yes.
Q. Do you know any of the authors of Exhibit 12?
A. No.
Q. Do you know Sandra Hunter at the University of Michigan?
A. No.
Q. Does the biography, Number 3, say that she is in the School of Kinesiology at the University of Michigan?
A. Yes.
Q. And you just haven't interacted with her before?
A. No.
Q. I'd like to turn to the second page of this, which is Page 275. Do you see on the right-hand column "Statement 2: The Male-Female Performance Gap is

Evident before Puberty"?
A. I see that, yes.
Q. Do you see in the second sentence of the paragraph that follows it reads, "For example, among the best prepubescent athletes in the United States, the male-female performance gap is approximately 3%-5% in track and field running events (Fig. 4) and approximately 5%-10% in jumping events," citation to 11, 13. "The magnitude of the male-female performance gap is smaller in swimming (approximately 1%-5%) than in track and field," citation to Article 12.

Do you see all that?
A. Yes.
Q. If we were to look on Page 279 of this article, Page 279 in the "References" section.
A. Yes.
Q. Do you see Articles 11, 12, and 13 listed?
A. Yes.
Q. Is Article 11 an article by Atkinson dated 2024?
A. Yes.
Q. Is Article 12 an article by Senefeld dated 2019?
A. Yes.
Q. Is that 2019 Senefeld article one that you cite in your rebuttal report in this case?
A. I don't believe so.

Q. Article 13 by Brown dated 2024. Do you see that?
A. Yes.
Q. If we were to turn back, then, to Page 276, you see Figure 4 that was referenced at the bottom of 276?
A. Yes.
Q. Do you see the X axis in these two charts says "Age, years"?
A. Yes.
Q. Do you see the Y axis says "Sex Difference, %"?
A. Yes.
Q. And is the graph on the left for track and field six different disciplines?
A. Yes.
Q. And is the graph on the right, "Freestyle Swimming," six different lengths or distances?
A. Yes.
Q. Does the X axis in Figure 4 contain data for 7 and 8-year-olds?
A. Yes.
Q. 9-year-olds as well; right?
A. Yes.
Q. So this is all data that is earlier than the Handelsman Figure 1 that we looked at earlier; right?
A. That's correct.
Q. Would you consider 7-year-olds to be prepuberty?

A. Yes.
Q. Would you consider 8-year-olds to be prepuberty?
A. There's a chance that some 8-year-olds will have experienced puberty that would be considered normal, but for the most part a majority, yes.
Q. The majority of 8-year-olds are not experiencing puberty, either boys or girls; right?
A. Correct.
Q. Are the majority of 9-year-olds experiencing puberty?
A. Not the majority, but I think enough that the data would be hard to call it strictly prepubertal.
Q. What percentage of 9-year-olds do you think are experiencing puberty? Let's start with boys.
A. Ten percent.
Q. What percentage of 9-year-old girls do you think are experiencing puberty?
A. Probably 20 percent.
Q. And then for age 10, are the majority of 10-year-olds experiencing puberty?
A. Not the majority, no.
Q. What percentage of 10-year-old boys are experiencing puberty?
A. Maybe 15 to 20 percent.
Q. And what percentage of 10-year-old girls are experiencing puberty?

A. 30 to 35 percent.
Q. So at each of the ages that you just mentioned, it sounds like there are more girls experiencing puberty than boys; is that right?
A. Yes.
Q. And so for these graphs in Figure 4, is it true that at every age boys have a -- there's a recorded difference between boys and girls in track and field?
A. In the observational data that's presented here, that's -- that is the case.
Q. Is this --
A. Yes.
Q. Is the same true for freestyle swimming that every age there is an advantage between -- of boys over girls?
A. It's hard to tell if that's the case with the 800-meter freestyle swimming. It looks close to zero at age 11.
Q. Would that be for 11-year-olds?
A. Yeah.
Q. Other than the 11-year-old freestyle swimming data, does it appear that boys have an advantage over girls in the six freestyle swimming distances recorded?
A. So I don't think that's what this is showing specifically. I think it's showing that the observed times are faster.

Q. Let me rephrase my question, then.

In all six of the freestyle swimming distances, did boys on average have faster times than the girls at every age listed?

A. Yes.

Q. The previous page on 275 has a sentence that runs over the page. It begins, "The extent to which these sex differences in children reflect the impact of biology, socialization, or both is a matter of discussion (20), but differences in early childhood body composition indicate that at least some of the male-female performance gap among prepubertal children is due to intrinsic biological factors."

Did I read that correctly?

A. You did.

Q. Do you have any journal articles you can cite that disputes that statement?

A. Not specifically. I think that this is the last sentence in a discussion of -- of various potential impacts to explaining these things. But the answer to your question is -- is no, I don't have a specific resource to dispute that -- that there's at least some -- that -- that there's differences in early childhood body composition, but I don't think that the logical conclusion from that is that -- that that

proves at least some of the male-female performance gap among prepubertal children is due to intrinsic biological factors necessarily. I don't think she's made that case at least to me.

Q. You don't have a journal article to cite that disproves that case, though, do you?

A. No.

Q. If we turn to the summary on Page 279. The first two sentences read, "There are profound sex differences in human performance in athletic events determined by strength, speed, power, endurance, and body size such that males outperform females. These sex differences in athletic performance exist before puberty and increase dramatically as puberty progresses."

Did I read that correctly?

A. Yes.

Q. Do you have any journal articles that disprove that conclusion?

A. Well, I guess I would say, you know, body size, you know, she doesn't have any citations for this -- this very compact sentence with a lot in it, but there's no -- there's no significant difference between the height of boys and girls in prepubertal ages according to the CDC growth charts, for example. You know, I don't know if she's claiming that there's differences

in strength, speed, power, endurance, and body size in prepuberty that -- but that's what this sentence implies. It doesn't seem like she's made those -- she's proven those -- all of those points in her -- in her article. So I guess that was my attempt at answering your question.

Q. And we don't have time to go through all the different support in this article. Let me just ask you about the second sentence, then, since you've identified your dispute based on the CDC growth charts on height. That second sentence that says that "These sex differences in athletic performance exist before puberty and increase dramatically as puberty progresses," do you have any peer-reviewed journal articles disputing that statement?

MS. BERG: Objection. Vague. Lacks foundation.

A. No.

MR. SMITH: Let's mark Exhibit 13.

(Marked EXHIBIT 13 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you what's been marked as Exhibit 13. Do you recognize Exhibit 13?

A. Yes.

Q. What is Exhibit 13?

A. Let me just make sure that I . . . So this is one of the articles that we were just talking about from the previous article that was citing to this article which is called "Sex Differences in Track and Field Elite Youth."
Q. Does it appear to be a fair and accurate copy in Exhibit 13 of the article that you've seen before?
A. Yes.
Q. Was this article published in 2024?
A. Yes.
Q. Do you know any of the authors on this article?
A. No.
Q. You see in the abstract there's a bold word that says "Conclusions"?
A. Yes.
Q. It says, "Before 12 year of age in elite youth track and field athletes, there was a consistent and significant sex difference of approximately 5%, such that males ran faster and jumped higher and farther than females."
Did I read that correctly?
A. Yes.
Q. Do you know if -- strike that.
Let's turn to Page 1393. Do you see Figure 1 on Page 1393?

A. Yes.
Q. Are there six charts, Letters A through F, in Figure 1?
A. Yes.
Q. Is Chart A for 100 meters?
A. Yes.
Q. Chart B for 200 meters?
A. Yes.
Q. Chart C for 400 meters?
A. Yes.
Q. Chart D for 800 meters?
A. Yes.
Q. Chart E for long jump?
A. Yes.
Q. Chart F for high jump?
A. Yes.
Q. Is the X axis for all six of these charts the age of the individuals?
A. Yes.
Q. Figure 1 says that it's displaying age-related improvements in track and field performances of elite youth males and females. Do you see that? The very first sentence in the Figure 1 text.
A. Yes.
Q. Do you see in the second to last sentence it says

"Dagger symbols indicate better performance (faster velocity or longer or higher jump) among males compared with analogous females in the same age group"? Did I read that correctly?

A. Yes.

Q. In Chart A for 100 meters, is there a dagger symbol at every single year between ages 7 and 18?

A. In A you said?

Q. In Chart A, yes.

A. Yeah. I just wanted to just reflect on the fact that it says indicate better performance and not necessarily statistically significant better performance. So I think the answer to your question is yes, there's daggers in each of those ages.

Q. And in Chart A that is showing the velocity or how fast someone was running; right?

A. "Age-related improvements in track and field performance of elite youth males and females. Scatter and line plots display the improvement in performance across youth years among male youth . . ."

Q. I'm only asking you about the Y axis, which is velocity MS minus one. Do you see that?

A. Yeah. I'm just trying to understand if it's talking about change over time or just standard velocity, so that's why I'm pausing. Because it says age-related

improvements. "Scatter and line plots display the improvement in performance across youth years . . ." So it's -- it -- so I think, if I'm understanding the graphs correctly, it's that there's an improvement of six meters per second in the hundred meter at age 7, at age 8, but not necessarily that they're running at six meters per second, but I could be interpreting that -- that incorrectly.

Q. So you don't understand these graphs to be showing that the improvement over time?

A. Well, I guess I -- I'm -- I'm seeing graphs that look very, very close together from ages 7 to 12 and then a separation of the two lines, so I'm -- so I don't dispute that there's daggers under most of these lines, that there's -- that the circle dot is higher than the triangle dot, so a little unclear as to whether it's describing actual speed or change in speed by year. So that's just why I'm pausing.

Q. Well, let's complete this figure and then I think we'll go to the actual data if you need it.

Back to my question. Is there a dagger symbol on every single year in Chart A?

A. Yes.

Q. Is there a dagger symbol for every year in Chart B?

A. Yes.

Q. Is there a dagger symbol in every year in Chart C?
A. Yes.
Q. Is there a dagger symbol for all but the eight -- for -- strike that.
Is there a dagger symbol for every year in Chart D with two dagger symbols at age 7 and 8 above the line?
A. Yeah. But I think that that's the same. It's just they couldn't fit the dagger below.
Q. Is there a dagger symbol for every year in Chart E?
A. Yes.
Q. Is there a dagger symbol for every year except age 7 in Chart F?
A. Yes.
Q. If we turn back a page to Page 1392, you see Table 1 is "Age-group performance times for track events of top 50 youth for both males and females."
Do you see that?
A. Yes.
Q. So this is the underlying data that I think you were longing for previously?
A. Sure.
Q. So if we looked at -- let's take age 7. Do the boys have a lower time and therefore faster at age 7 in the hundred meters versus the girls on the right-hand side

of that chart?
A. Yeah. To be clear, this is the top 50 youth for males and females, and the answer is yes.
Q. Is the answer also yes that for age 7 at 200 meters the boys have a faster time?
A. Yes.
Q. Is the answer also true at age 7 at 400 meters that the boys have a faster time?
A. Yes.
Q. For all three distances at age 8, do boys have a faster time?
A. Yes.
Q. For all three --
MS. BERG: Objection. Vague. Sorry. Objection to the last question. Vague.
BY MR. SMITH:
Q. For all three distances, 100 meter, 200 meter, 400 meter, and we can include 800 meter, for age 9 do the boys have a faster time than girls?
A. Yes.
Q. For all four distances, 100 meter, 200 meter, 400 meter, 800 meter, at age 10 do boys have a faster time than girls?
A. Yes.
Q. And so this underlying data would support that on

Charts A through D that the boys were faster at all four of those ages, 7, 8, 9, and 10, than girls; right?

A. In this -- in this set of observational data, yes.

Q. Then at Table 2 at the bottom we have the long jump and high jump data for male youths and female youths; right?

A. Yes.

Q. The Table 2 says it's "Age-group performance distances of top 50 youth for both males and females"; right?

A. Yes.

Q. Taking age 7 long jump, the males jump farther than the girls; correct?

A. Long jump, yes.

Q. Age 8, the boys had a longer jump than girls; correct?

A. Yeah. With the caveat that there's a little -- or no. That's -- yeah. Yes. That is true.

Q. Age 9 the boys had a longer jump than girls; correct?

A. Yes.

Q. Age 10 boys had a longer jump than girls; correct?

A. Yes.

Q. Age 8 on the high jump, the boys had a higher jump than girls; correct?

A. Yes.

Q. Age 9 boys --

A. Sorry. With the caveat there's a little A, and that means that we've been talking about age-group performance distances of top 50 youth for males and females, but when there's a little A for age 7 for high jump where that was the one example where the females were higher and 8 where, you're correct, the males were higher in that one, it says, "Data associated with high jump performances were incomplete for youth" -- "elite youth for both the 7-year age group," where there was only seven males and seven females and the 8-year age group where there was only 17 of both. So that's just different from the other ones as we're going through these one by one.

Q. Thank you for that explanation, Doctor.

For age 9, high jump, the boys jumped higher than the girls; correct?

A. Yes.

Q. For age 10, the boys jumped higher than the girls; correct?

A. Yes.

Q. If we turn to Page 1394. In the "Discussion" section. Do you see that?

A. Yes.

Q. The second sentence says, "The major findings from this study are threefold. First, males ran faster,

jumped farther, and jumped higher at every age between 8 and 18 years compared with females."

Did I read that right?

A. Yes.

Q. "Second, before the ages of puberty, there was a consistent sex difference in performance of about 5% across key track and field events."

Did I read that correct?

A. Yes.

Q. The next sentence says, "This sex difference in performance (%) among youth was significant, although smaller than the sex difference in performance that emerged with puberty and among adult males and females."

Did I read that correctly?

A. Yes.

Q. If you flip the page to 1395, do you see a section entitled "Sex Differences in Athletic Performance Before Male Puberty"?

A. Yes.

Q. If you flip to Page 1396, do you see a "Limitations" section on the right-hand side?

A. Yes.

Q. Do you see the third sentence that reads "We did, however, analyze the sex difference in ranking to

determine whether social factors often associated with lower participation and a reduced talent pool of females, and which widens the sex difference in performance, contributed before puberty. This was not the case."

Did I read that correctly?

A. Yes.

Q. Then in the "Conclusions." You see the first sentence. "Before puberty (ages 7-12 year) in elite youth track and field athletes, there was a consistent sex difference in athletic performance of about 5%, such that males ran" -- "run faster and jump higher and further than females."

Did I read that correctly?

A. Yes.

Q. Are you aware of any journal articles that would dispute those conclusions?

A. Not with respect to the questions they were asking in this study, no.

Q. If you look back at article Exhibit 12, in the introduction of Exhibit 12, the Joyner article, you see in the first paragraph of the article, the second to last sentence of that paragraph begins with the word "Second"? Do you see that?

A. Sorry. Can you orient me one more time --

Q. The second to last paragraph, the sentence of the first paragraph, begins with the word "Second."
A. Okay.
Q. It says, "Second, because the margin of victory is often very small in elite sports, sports policy makers routinely regulate competitive advantages of 1% or less."
Did I read that correctly?
A. Yes.
Q. Do you have any expert opinion on when sports policymakers regulate competitive advantages?
A. No.
Q. Do you have any expert opinion on when they should regulate competitive advantages?
A. No.
MR. SMITH: I'd like to mark Exhibit 14.
(Marked EXHIBIT 14 for identification)
BY MR. SMITH:
Q. I've handed you Exhibit 14, Dr. Shumer. Do you recognize Exhibit 14?
A. Yes.
Q. Have you seen Exhibit 14 before?
A. I believe this was the article cited in one of the expert reports from defendants.
Q. What is Exhibit 14?

A. It's titled "Sex-based differences in track running distances of 100, 200, 400, 800, and 1500 meters in the 8 and under 9-10-year-old age groups."
Q. Does this appear to be a fair and accurate copy of the article you read before?
I guess I should ask, have you read this article before?
A. I don't think -- I don't remember reading this article before.
Q. Do you recognize any of the authors of Exhibit 14?
A. I recognize the name of Dr. Brown.
Q. Is Dr. Brown a defense expert in this case?
A. I believe that's the same doctor.
Q. Is this Exhibit 14 an article that was published in 2024 at the bottom citation?
A. Yes.
Q. Is the European Journal of Sport Science a peer-reviewed journal?
A. I don't know.
Q. You don't know that it's not; correct?
A. Correct.
Q. You see at the top that there are three dates on Exhibit 14, a received date, a revised date, an accepted date? Do you see that?
A. Yes.

Q. Does a revised date suggest to you that this might have been as a result of a peer review process?
A. I suppose that could be one explanation. I -- I don't dispute that it's peer-reviewed, but I don't -- I don't know.
Q. If we turn to Page 222 of Exhibit 14. Do you see the "Discussion" section on that page?
A. Yes.
Q. The first paragraph reads, "In this evaluation of finishing times for finalists in the 100, 200, 400, 800, and 1500 meter events in the USATF National Youth Outdoor Championships and Junior Olympic National Championships from 2016 to 2023, males in the 8 and under and 9-10-year-old age groups had faster average finishing times than females, and the fastest times for males were faster than the fastest times for females."

Did I read that correctly?

A. Yes.
Q. Just to be complete, the next sentence says, "These sex-based differences in running performance corresponded with moderate to large effect sizes indicate that the differences are of considerable practical importance."

Did I read that sentence correctly?

A. Yes.
Q. The final sentence of that paragraph then reads, "These findings therefore indicate that there are consistent and meaningful sex-based differences in track running performance in the 100, 200, 400, 800, and 1500 meter events before puberty."
Did I read that correctly?
A. You did.
Q. Are you aware of any peer-reviewed journal articles that disagree with Dr. Brown's conclusions in that paragraph we just read?
A. Well, I guess I'm just not sure that his own paper proves exactly those two sentences as this is specific to, you know, the -- these elite competitions of national -- the best national athletes as I understand it, but -- but I don't have anything to dispute the fact that in that pool of athletes these are the -- the times and those times are different between the males and females in those age groups.
MR. SMITH: Let's mark Exhibit 15.
(Marked EXHIBIT 15 for identification)
BY MR. SMITH:
Q. Dr. Shumer, I've handed you what's been marked as Exhibit 15. Do you recognize Exhibit 15?
A. Yes.

Q. What is Exhibit 15?
A. It's another article written by looks like the same authors in this one. It is, you know, just presenting data from competitions from javelin this time and long jump in a similar way as the last article.
Q. Was this article published in 2025 according to the bottom citation on Page 1?
A. Yes.
Q. Had you seen Exhibit 15 before I just handed it to you now?
A. I don't think so.
Q. It's a fascinating read that you can do on your own time, but for now let's turn to Page 5. Do you see the section "Discussion" on the right-hand side?
A. Yes.
Q. The paragraph begins, "In this evaluation of the top 8 distances in shot put, javelin throw, and long jump in the USATF National Youth Outdoor Championships and Junior Olympic National Championships from 2016 to 2023, males in the 8-and-under and 9-10-year-old age groups had farther average distances than females and the longest distances for males were farther than the longest distances for females."
Did I read that correctly?
A. Yes.

Q. And the underlying data is on the pages that we skipped for all of these competitions as are the charts depicting that data, but if you flip forward one page to Page 6 of 11, do you see the first long paragraph on the left-hand side that begins "To the best of our knowledge"?
A. Yes.
Q. That sentence reads, "To the best of our knowledge, this is the first evaluation of sex-based differences in competitive shot put performance in athletes 10 years old and younger."
Did I read that correctly?
A. Yes.
Q. Do you have any knowledge of journal articles on competitive shot put performance in athletes 10 years old and younger that would dispute that sentence?
A. No.
Q. The next sentence says that "The current data indicate that the average distances for shot put are farther for males than females by 19.3% in the 8-and-under and 6.5% farther in the 9-10-year-old age groups."
Did I read that correctly?
A. Yes.
Q. If you looked on the right-hand side of this page, you see another paragraph that begins "To the best of our

knowledge"; right?
A. Yes.
Q. It says, "To the best of our knowledge, this is also the first evaluation of sex-based differences in competitive javelin throw performance in children 10 years of age and younger."
Did I read that correctly?
A. Yes.
Q. Are you aware of any other evaluation of sex-based differences in competitive javelin throw for children 10 years of age and younger besides this Exhibit 15?
A. No.
Q. The next sentence reads, "The current data indicate that the average distances for javelin throw are farther for males than females by 32.6% in the 8-and-under and 23.5% farther in the 9-10-year-old age groups."
Did I read that correctly?
A. Yes.
Q. If we flip forward one page to Page 7. On the left-hand side there's a paragraph at the bottom left that begins "In the present data." Do you see that?
A. Yes.
Q. The sentence reads, "In the present data, the average long jump distances for 8-and-under males were 4.7%

farther than females and were 3.8% farther for 9-10-year-old males than females."

Did I read that correctly?

A. Yes.

MR. SMITH: Let's mark Exhibit 16.

(Marked EXHIBIT 16 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you what's been marked Exhibit 16. Do you recognize Exhibit 16?

A. I don't think I've read this one. It looks like it's another report of statistics from elite sports, this time swimming, written by the same authors.

Q. According to the citation at the bottom of Page 1, does this appear to have been published in 2025?

A. It does.

Q. Is the title of this article "Sex-based differences in swimming performance in 10-years-old-and-under athletes in short course national competition"?

A. That's the title.

Q. If we turn to Page 4 of 10. Do you see the "Discussion" section on the bottom right-hand side of Page 4?

A. Yes.

Q. The sentence that begins that paragraph reads, "The present data indicate that at a national level short

course youth swimming meet over seven years of competition when the 8 fastest times in each event for the 10-and-under age group are evaluated, males were 1.16%-2.63% significantly faster than females in the 50 yard, 100 yard, and 200 yard freestyle, 100 yard backstroke, 50 yard breaststroke, 100 yard butterfly, and 100 and 200 yard IM," which stands for individual medley.

Did I read that correctly?

A. Yes.

Q. You said that you hadn't seen this paper before I just handed it to you?

A. I don't -- I don't believe so.

Q. Are you aware of any journal articles that dispute that prepuberty boys swim faster than girls at the distances that Dr. Brown evaluated?

A. Well, I don't think that's exactly what this says without more intimate knowledge. He's just taking statistics from national championship competitions and displaying the results. So that's not really research or a study with -- that can draw conclusions like I think that you're implying. And I think to generalize this in the last three articles to high school sports in general across the country to then make another leap and claim that there's conclusions to be drawn

from the impact of biology as opposed to other factors, you know, I just want to be careful that we're not -- as I am agreeing that this is what each of the sentences you're reading actually says, that I don't want to lose focus on the fact that I'm not sure that -- that -- that I want to make sure that it doesn't imply that I'm agreeing with the underlying premise that the biologic differences are the driver of competitive advantage that we're seeing perhaps in the -- in basically the statistics that are presented by these three authors.

MR. SMITH: I'll move to strike that response as non-responsive.

MS. BERG: No objection to that moving to strike the response as non-responsive.

BY MR. SMITH:

Q. Dr. Shumer, you haven't evaluated any data from sporting competitions at any level, be it high school, middle school, national competitions? You haven't looked at any sports data for the purposes of your expert report in this case, have you?

A. No. Not that I independently compiled.

Q. So you don't know whether the data that was reported in these Exhibits 12 through 16 that we just looked at is or is not representative of athletes in high school

in Arizona, do you?
A. I think just as a physician and scientist when reading any paper about anything, I think it's -- it's my job to think critically about the participants that are described in the paper and then say is this generalizable to the population that we're thinking about? What reasons could it be generalizable? For what reasons may it not be generalizable? So, you know, I think that's just the role of any reader of any medical journal that that generalizability is an inherent limitation of any study, this -- these studies being no different.
Q. You're raising the question of generalizability, but you haven't tried to find out any answers about whether it's generalizable to other populations, have you?
MS. BERG: Objection. Vague.
A. I haven't performed independent research to that -- to that effect, no.
BY MR. SMITH:
Q. Because you haven't performed independent research, you don't know whether it's generalizable or not to a population such as middle school or high school, do you?
A. I don't know how generalizable it would be.

Q. You mentioned earlier when we were discussing your report that there were studies of other countries involving children fitness test; is that right?
A. I did mention that.
Q. And as I recall, you didn't identify any specific articles that you remember reading along those lines, but you just remember that there are articles out there about fitness tests --
A. I didn't provide names of articles. Correct.
Q. Let's see if you recognize any of these articles, then.

MR. SMITH: I'll mark Exhibit 17.

(Marked EXHIBIT 17 for identification)

BY MR. SMITH:
Q. Dr. Shumer, I've handed you Exhibit 17. Do you recognize Exhibit 17?
A. I'm sorry. I'm just not sure if I -- if it's one of the ones that I was thinking of or not. I'm not sure.
Q. Do you remember reading Exhibit 17 at any point?
A. I think I have, but I'm just not a hundred percent sure that this is the article that I read that -- that is related to this topic. I believe so, but I'm not a hundred percent sure.
Q. And before I try to connect it to one of the articles you read, let me just ask if this is a fair and

accurate copy of the article that you believe that you read at some point.

A. Yes.

Q. Is this article one that was published in 2018?

A. Yes.

Q. Do you know any of the authors of this article?

A. No.

Q. Is the title of Exhibit 17 "European normative values for physical fitness in children and adolescents aged 9-17 years: results from 2 779 165 Eurofit performances representing 30 countries"? Is that the title of this article?

A. Yes.

Q. If we flip to Pages 5 -- let's start on Page 5. Do you see Tables 1 and 2 on Page 5?

A. Yep. Yes.

Q. And do you see Tables 3 and 4 on Page 6?

A. Yes.

Q. For Table 3 -- strike that.

For Table 4 you see it's for standing broad jump centiles by age and sex?

A. Yes.

Q. It's based on 464,900 test persons of children and adolescents aged 9 to 17 years representing 29 countries?

A. Yes.
Q. And do you see the data in Table 4 is broken out first by boys and girls?
A. Yes.
Q. And it's broken out within each sex by age from 9 to 17?
A. Yes.
Q. And then do you see the percentiles 5, 10, 20, continuing on by 10 up to 90 and then 95?
A. Yes.
Q. And so you could look at this table and compare boys at each of those percentiles for each year against girls?
A. You could -- you could do that.
Q. Would this also allow you to make any conclusions without considering puberty since you could separate whatever percentage you estimate of puberty at those ages and then look at just lower percentiles?
A. I don't think so.
Q. And so it's your opinion that someone entering puberty would not be one of the high performers in these ages?
MS. BERG: Objection. Mischaracterizes the testimony.
A. Are you asking -- no. I guess I'm not exactly sure what you're asking.

BY MR. SMITH:

Q. You testified earlier that starting at age 9 there will be some boys and girls that have started puberty; right?

A. Yes.

Q. And that number increases for -- as you proceed through each year; right?

A. Yes.

Q. What I'm asking next, then, is do you think that boys who are entering puberty will have any advantages over boys who have not entered puberty?

A. In the standing broad jump, perhaps. But with the -- there's no way to know which of the 35,000 boys are those in puberty versus the ones that aren't. And I think making an assumption that the ones in puberty are all represented in the upper end wouldn't be a conclusion that I would draw from the data.

Q. You have eleven different percentiles to look at in Table 4; correct?

A. Um-hmm.

Q. Is that right?

A. Yes.

Q. For age 9, if we are looking at the broad -- standing broad jump, did the boys jump farther than the girls at all nine of those percentiles?

A. Yes.
Q. If we flip the page to Page 7, Table 5 relates to handgrip strength; right?
A. That's correct.
Q. It's broken down the same way as the previous table we looked at; right?
A. Yep.
Q. So let's look at age 9. Did the boys have stronger handgrip at each percentile, all eleven, than the 9-year-old girls?
A. Yep. The number is bigger in each of those categories, yes.
Q. If you see the paragraph in the -- between the tables on the left-hand side, it begins "On average." Do you see that?
A. Yes.
Q. It says, "On average, boys performed substantially better than girls at each age group on muscular strength (ES: large), muscular power (ES: large), muscular endurance (ES: moderate to large), speed-agility (ES: moderate) and CRF (ES: large) tests, with the magnitude of the sex-specific differences increasing with age and accelerating from about 12 years (figure 6)."
Did I read that correctly?

A. Yes.
Q. If we turn the page to Page 8. Do you see the same table division that we looked at in the previous tables?
A. Yes.
Q. Is Table 8 for the ten by five meter agility shuttle run?
A. Yes.
Q. For age 9, did the boys complete the ten by five meter agility shuttle run faster than the girls at all eleven percentiles?
A. Yes.
Q. Having looked at that article now, do you remember whether that was one of the articles that you were referencing in our discussion earlier?
A. I don't think it -- I don't think it was, but I -- I recognize the article, but I don't think it was one I was thinking of when we were talking before.
Q. All right. Let's see if this is it.

MR. SMITH: Exhibit 18.

(Marked EXHIBIT 18 for identification)

BY MR. SMITH:
Q. Dr. Shumer, do you recognize Exhibit 18?
A. Yes.
Q. What is Exhibit 18?

A. It's titled "Physical fitness normative values for 6-18-year-old Greek boys and girls, using the empirical distribution and the lambda, mu, and sigma statistical method."
Q. Have you seen Exhibit 18 before?
A. Yes.
Q. Was this one of the articles that you were mentioning when we discussed these types of studies earlier?
A. This is one of the ones I was thinking of, yes.
Q. Was this published in 2015?
A. Yes.
Q. Or 2016?
A. It looks like one of those is -- is true, yes.
Q. Do you know any of the authors of Exhibit 18?
A. No.
Q. If you turn to the second page of this, which is Page 737 in the top right, do you see the "Methods" section on the right-hand side? The second page of the article.
A. Sorry. Yes.
Q. Do you see that this study involved 424,328 children?
A. Yes.
Q. Do you see that the participation rate was 40 percent of the total Greek population?
A. Yes.

Q. If we turn to Page 739. It's confusing because there are a lot of different page numbers on here.
A. I know.
Q. It's Page 733 in the bottom right and Page 739 in the top right.
A. Okay. Thank you.
Q. You see a "Results" section in the left-hand side?
A. Yes.
Q. Do you see in the second paragraph it says "For each of the fitness tests, performance was better in boys compared with girls, except for the SR test"?
A. Yes.
Q. And then if you look at the next pages, do you see the data underlying those conclusions?
A. Yes.
Q. If you look at the very bottom right-hand of the page we were looking at on results, there's a sentence that begins "Our findings are in accordance with recent studies from Latvia."

Do you see that?

A. Not yet.
Q. So the very last words at the bottom right-hand.
A. Okay.
Q. That sentence continues past the tables we just looked at and picks back up five pages later. Do you see

where the sentence recommences?
A. Yes.
Q. And there are a series of studies listed from Portugal and Australia as well?
A. Yes.
Q. And you see the first full sentence on that page says, "In all the aforementioned studies, boys performed better than girls in cardiorespiratory endurance, speed/agility, muscular strength, and muscular endurance tests, while older ages, in both sexes, have incorporated higher percentile values in comparison with younger ones."
Did I read that correctly?
A. Yes.
Q. And then on the right-hand side of that page you see "Conclusions" lower down on the page?
A. Yes.
Q. You see the second sentence says, "Boys performed better in all measurements except flexibility than girls of the same age and older children performed better than younger ones."
Did I read that correctly?
A. Yes.
Q. Did you take this article into account when forming your expert opinion, Dr. Shumer?

A. I think when -- I think the answer is yes when forming my expert opinion. You know, I'm not claiming that there may -- that there may be observational data to suggest better scores in activities in boys and girls in different areas or different countries or even our own country, but that the -- that my -- so I don't think that is something that conflicts with my expert opinion, but in addition to that, the link between those observational differences and a biologic driver of those differences is something that I don't find to be demonstrated in literature like this.

Q. Why are observational data like those reported in these exhibits we've been looking at, why are they not relevant to your expert opinion?

MS. BERG: Objection. Vague.

A. It's not that they're not relevant. It's just that there's not a cause and effect that you can discern from this type of data such that -- you know, I think in one of the sentences in one of these articles that we didn't read, you know, it was saying there's various possible causes for this, including -- including the hypothesis that -- that -- that you seem to be supporting, that there's inherent biologic differences that are driving this advantage and also possible causes that are related to exposure,

enthusiasm to sports across the national population, differences in coaching, differences in access to playing, and, you know, I don't think that the -- I don't think that any of these articles that demonstrate these differences are attempting to parse out the -- that -- that question that -- that I guess we're both sort of asking each other.

BY MR. SMITH:

Q. And I'm not asking about the causation question. I'm just saying these articles that we've looked at from Articles 12 through 18 show data of a difference between prepuberty boys and prepuberty girls; correct?

A. Well, I think that the data specifically under age 8 you could say that with more confidence. The -- you know, all of these ones from Brown that were including -- or the ones that were the European one, 9 to 17, you know, so just a blanket statement that all of these show that, I would just put the caveat that those that are exclusively demonstrating prepubertal data but not all of the data that we just reviewed.

Q. Do you know of any observational data for children 8 and under that shows girls have an advantage over boys in say track and field?

A. I think that I've seen data suggesting different -- differences with regards to flexibility in girls, but

that doesn't answer your question. The answer is no with regards to track and field. I don't have data specific to that, to dispute the fact that -- that -- I don't have -- I don't have an observational study, for example, showing that in a different group of people the highest score for girls at a certain age under puberty was -- was faster or higher.

Q. You don't have any peer-reviewed journal articles that point to some non-biological cause of these observational differences that we've looked at, do you?

A. I don't have data to -- to demonstrate that, no.

Q. So you've suggested several different alternatives, but there's no journal article that finds any of those alternatives actually are a cause of any of this observational data, is there?

A. I don't think that there's any -- any article that proves a cause in any direction.

Q. We did look at articles that said that there was at least some biological component; right?

A. That was -- I think that was ones -- I think that was in one of the articles that suggested that --

Q. And we also --

A. -- as -- s one of their -- their conclusions.

Q. And we also looked at an article that ruled out some

of those social factors that you're talking about; right?

MS. BERG: Objection. Mischaracterizes the evidence.

A. That was a statement that was read in one of the articles that I recall that they had tried to assess for those.

BY MR. SMITH:

Q. Just so we're all on the same page, Exhibit 13 is what I was referencing. If you looked at Page 1396 toward the back, you see the "Limitations" section. Do you remember looking at this?

A. Yes, I do.

Q. Okay. And I'm referring to the third and fourth sentences of this paragraph, which I've read to you previously. Do you see that they looked at whether there are social factors that were contributors; right?

A. That's what they said, yes.

Q. And they said that this was not the case; right?

A. That's what they --

MS. BERG: Objection. Mischaracterizes the evidence.

A. That's what the authors wrote, yes.

BY MR. SMITH:

Q. And so you don't have anything that goes the other direction when it comes to social factors being a cause of differences in athletic performance between prepuberty girls and prepuberty boys, do you?
A. I don't have an article that's demonstrating that as a cause, no.
MS. BERG: Do you need a break?
MR. SMITH: We've been going about an hour. Do you want to take a short break?
THE WITNESS: Okay.
MR. SMITH: Off the record.
VIDEO TECHNICIAN: Going off the video record. The time is 3:55 p.m.
(Recess taken at 3:55 p.m.)
(Back on the record at 4:07 p.m.)
VIDEO TECHNICIAN: Back on the video record. The time is now 4:07 p.m.
BY MR. SMITH:
Q. Dr. Shumer, do you know who Joshua Safer is?
A. Yes.
Q. How do you know him?
A. He's the -- I think he's the president of the Endocrine Society or has a role in the Endocrine Society. He's an endocrinologist. And I met him when I lived in Boston as we were colleagues in the same

city.
Q. Do you know if Mr. Safer has served as an expert witness in any case?
A. I -- I'm -- I'm remembering that I think he was an expert in maybe it was Idaho, but I'm not certain about that.
Q. Have you reviewed any of Dr. Safer's reports in any sports related case?
A. I know I've read his -- some writings about this topic from him. I don't know if it was an expert report from Idaho or if it was writings that he was doing for another reason. If I did, it was about four years ago. And I guess that's all -- that's what I would say.
Q. Do you know who Stephen Rosenthal is?
A. Yes.
Q. How do you know him?
A. He's a pediatric endocrinologist that works at the University of San Francisco, and I think he's still clinically active. He may be retired. And I know him through being a colleague in the field of pediatric endocrinology, through conferences, and -- and I've read his articles related to the topic of treatment of gender dysphoria.
Q. Do you know if Dr. Rosenthal has served as an expert

witness in any case?
A. Not that I know of.
Q. Have you reviewed any expert report that Dr. Rosenthal has written in any case?
A. I'm not aware of seeing anything like that.
Q. Dr. Shumer, did you plagiarize any of Dr. Safer's reports to prepare Exhibit, your report in this case?
A. I think that I read Dr. Safer's report as I was preparing to write the first report that I wrote related to gender and sports maybe four years ago, but I wouldn't use the word "plagiarize."
Q. Did you plagiarize any of Dr. Rosenthal's reports to prepare Exhibit 1, your report in this case?
MS. BERG: Objection. Vague.
A. I don't remember reading Dr. Rosenthal's reports, but if -- if I -- if I did and don't recall, I wouldn't consider anything that I've written plagiarization.
BY MR. SMITH:
Q. Does plagiarization have a specific defined term in your mind?
A. I guess using other people's work without incorporating your own thoughts into it. I don't have a specific definition, no.
Q. Do you know if your university has a definition for plagiarism?

MS. BERG: Objection. Relevance.

A. I imagine that there's -- there is one, but I don't -- I don't know what it is.

MR. SMITH: I'd like to mark Exhibit 19.

(Marked EXHIBIT 19 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you what's been marked Exhibit 19. Have you seen Exhibit 19 before?

A. I don't think I have. I think that I've read something of Dr. Safer's that was related to Idaho, as I said, but this looks to be West Virginia. Perhaps it's similar. But -- but I -- I don't -- I don't recall seeing this exact document.

Q. All right. I'd like you to keep that document, Exhibit 19, in front of you and pull out Exhibit 1. We're going to look at them both side by side.

All right, Dr. Shumer. Exhibit 1. Turn to Page 6. That's your report. Your report, Page 6. Okay. And Exhibit 19, Dr. Safer's report, turn to Page 5.

Do you see the heading of Dr. Safer's report "Relevant Medical and Scientific Background"?

A. Yes.

Q. Paragraph 17. "'Gender Identity' is the medical term for a person's internal, innate sense of belonging to

a particular sex."

Did I read that correctly?

A. Yes.

Q. Do you see a citation to one of Dr. Safer's articles in the New England Journal of Medicine in 2019?

A. Yes.

Q. And a citation as well to the Endocrine Society Guidelines, Table 1?

A. Yes.

Q. Paragraph 16 of your report. "'Gender Identity' is the medical term for a person's internal, innate sense of belonging to a particular sex."

Did I read that correctly?

A. Yes.

Q. Are those paragraphs identical in that sentence except for the lack of citation in Exhibit 1?

A. Yes.

Q. The next paragraph, Paragraph 17 in your report and Paragraph 18 in the other report. Do you see there's a paragraph that "Although the detailed mechanisms are unknown, there is a medical consensus that there is a significant biologic component underlying gender identity"? Do you see that?

A. Yes.

Q. Paragraph 17 of your report reads, "A person's gender

identity has a strong biological basis."

Do you see that?

A. Yes.

Q. Did you cite Dr. Safer in Footnote 1 of Exhibit 1?

A. I'm sorry. I didn't -- those aren't the same, are they? I didn't, no.

Q. Okay. Turning the page to Paragraph 18 in your report. Let's look at Paragraph 19 in Dr. Safer's report. "The terms 'gender identity,' 'gender roles,' and 'gender expression' refer to different things."

Did I read that correctly?

A. Yes.

Q. In Paragraph 18 of your report you say that "The terms 'gender role' and 'gender identity' refer to different things."

Did I read that correctly?

A. Yes.

Q. Are those paragraphs identical except for the reference to gender expression in Dr. Safer's report?

A. Right.

Q. Paragraph 20 in Dr. Safer's report. "Gender roles are behaviors, attitudes, and personality traits that a society (in a given culture and historical period) designates as masculine or feminine and/or that society associates with or considers typical of the

social role of men or women."

Did I read that correctly?

A. Yes.

Q. Is the wording similar but not exactly identical to your sentence in Paragraph 19?

A. It's similar.

Q. The second sentence in Dr. Safer's report. "The convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are examples of socially constructed gender roles from a particular culture and historical period."

Did I read that correctly?

A. Yes.

Q. The second sentence of your Paragraph 19. "For example, the convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are example" -- "are socially constructed gender roles from a particular culture and historical period."

Did I read that correctly?

A. Yes.

Q. So are the -- those sentences the same except for the two words "example of" in Dr. Safer's report?

A. Yes.

Q. In Paragraph 21 of Dr. Safer's report, let's look at

the second sentence first. It says, "It is an internal and largely biological phenomenon."

Did I read that correctly?

A. Which paragraph?

Q. The second sentence of Paragraph 21 in Dr. Safer's report.

A. Yes.

Q. The first sentence of your Paragraph 20 reads, "By contrast, gender identity is an internal and biologically influenced phenomenon."

Did I read that correctly?

A. Yes.

Q. Are those two sentences virtually the same between your report and Dr. Safer's report?

MS. BERG: Objection. Vague.

A. They're similar.

BY MR. SMITH:

Q. The first sentence of Dr. Safer's Paragraph 21 reads, "By contrast, 'gender identity' does not refer to a set of socially contingent behaviors, attitudes, or personality traits that a society designates as masculine or feminine."

Did I read that correctly?

A. Yes.

Q. Paragraph 20, second sentence of your report. "It

does not refer to socially contingent behaviors, attitudes, or personality traits."

Did I read that correctly?

A. Yes.

Q. Are those two sentences virtually the same?

MS. BERG: Objection. Vague.

A. They're similar.

BY MR. SMITH:

Q. If we look at Dr. Safer's Paragraph 23, do you see the discussion of biological sex in Dr. Safer's Paragraph 23?

A. Yes.

Q. On your Paragraph 24 do you see a discussion of biological sex?

A. Yes.

Q. So let's read the second sentence of Dr. Safer's Paragraph 23. "A person's sex encompasses the sum of several different biological attributes, including sex chromosomes, certain genes, gonads, sex hormone levels, internal and external genitalia, other secondary sex characteristics, and gender identity."

Did I read that correctly?

A. Yes.

Q. And the first sentence of your Paragraph 24. "From a medical perspective, a person's sex is comprised of

several components, including, among others, internal reproductive organs, external genitalia, chromosomes, hormones, gender identity, and secondary-sex characteristics."

Did I read that correctly?

A. Yes.

Q. Does Paragraph 23 in Dr. Safer's report contain citations again to the Endocrine Society guidelines and one of his articles in the New England Journal of Medicine?

A. Yes.

Q. Are those citations included in your Paragraph 24?

A. No.

Q. If we turn the page in Dr. Safer's report to Paragraph 25, do you see the paragraph that begins "Before puberty"?

A. Yes.

Q. So that paragraph reads, "Before puberty, age-grade competitive sports records show minimal or no differences in athletic performance between non-transgender boys and non-transgender girls before puberty. But after puberty, non-transgender boys and men as a group have better average performance outcomes in most athletic competitions when compared to non-transgender girls and women as a group. Based

on current research comparing non-transgender boys and men with non-transgender girls and women before, during, and after puberty, the primary known biological driver of these average group differences is testosterone starting at puberty, and not reproductive biology or genetics."

Did I read that correctly?

A. Yes.

Q. Does Dr. Safer then cite to the Handelsman's 2018 article?

A. Yes.

Q. If we move forward in your report to Paragraphs 36 and 37. Paragraph 36 on Page 11 reads, "Before puberty, girls and boys generally perform at the same level with some small differences at the margins (some favoring boys, some favoring girls). In contrast, post-pubertal boys as a group generally begin to show a significant athletic advantage over post-pubertal girls due to their exposure over time to the elevated levels of testosterone associated with male puberty."

Paragraph 37. "The biological driver of these average group differences is testosterone, not anatomy or genetics. Both boys and girls produce testosterone. After puberty, however, boys produce much higher levels of testosterone than girls, which

results in increased muscle mass and muscle strength. As a result, post-pubertal boys and men have an athletic advantage over girls and women in many sports."

Did I read that correctly?

A. Yes.

Q. The end of Paragraph 37 cites to the same 2018 Handelsman article as referenced in Dr. Safer's Paragraph 25; is that right?

A. Yes.

Q. And your discussion on Paragraph 36 and 37 closely follows what Dr. Safer had in Paragraph 25, doesn't it?

MS. BERG: Objection. Vague.

A. I think they -- they make similar points, but there's I think less overlap in -- in those two as some of the previous sentences we've discussed.

BY MR. SMITH:

Q. Some of the previous sentences overlap exactly, don't they?

A. Some of them do.

MS. BERG: Objection. Mischaracterizes the testimony.

A. Some of them do.

BY MR. SMITH:

Q. If we'll turn, then, to Paragraph 49 in Dr. Safer's report on Page 15. Do you see Paragraph 49?
A. Yes.
Q. Paragraph 49 in Exhibit 19 reads, "Even as applied to people without intersex characteristics or 46,XY DSDs, the statutory definition of 'biological sex' is inconsistent with West Virginia stated goal of 'promot[ing] equal athletic opportunities for the female sex.' By excluding girls who are transgender based on 'biological sex,' and defining that term to mean 'reproductive biology and genetics at birth,' West Virginia categorically prevents girls who are transgender from participating on girls' teams regardless of whether they are pre-pubertal, receiving puberty blockers, or receiving gender-affirming hormone therapy. But based on current research, the primary known biological cause of average differences in athletic performance between non-transgender men as a group and non-transgender women as a group is circulating testosterone - not 'reproductive biology and genetics at birth.' A person's genetic makeup and internal and external reproductive anatomy are not useful indicators of athletic performance and have not been used in elite competition for decades."
Did I read that correctly?

A. Yes.
Q. If we turn to Paragraph 47 in your report, Exhibit 1, you see it reads, "By suggesting sex to mean only biological sex determined at fertilization and revealed in utero or at birth, Arizona prevents Plaintiffs from participating on girls' teams because they are transgender girls. But the biological driver of average differences in athletic performance between men and women is circulating testosterone - not a person's transgender status or their biological sex determined at fertilization and revealed in utero or at birth. A person's genetic makeup and anatomy at birth alone are not reliable indicators of athletic performance."

Did I read that correctly?
A. Yes.
Q. Are all the concepts and phrasing that you used in Paragraph 47 contained in Dr. Safer's Paragraph 49?

MS. BERG: Objection. Vague.
A. I think some of -- the concepts are certainly similar. The phrasing is -- is -- is obviously different.
BY MR. SMITH:
Q. Some of the phrasing is the exact same; correct?

MS. BERG: Objection. Mischaracterizes the testimony and the evidence.

BY MR. SMITH:

Q. For example, take the exact -- the last sentence. "The person's genetic makeup and internal and external reproductive anatomy" is how that sentence begins, and your last sentence also begins "A person's genetic makeup and anatomy at birth"; right?

A. So three words are the same.

Q. And then both sentences talk about indicators of athletic performance as the crux of that sentence?

A. I suppose the themes of the sentence are the same, yes. But I -- I guess I'm -- I'm just trying to answer your questions with -- with -- with accurate answers, so . . .

Q. Sure. Yeah. And all I'm asking is the words "A person's genetic makeup and anatomy are not reliable indicators of athletic performance" are all contained in that last sentence in Dr. Safer's Paragraph 49; right?

A. No. I don't -- they're different. Right? I mean, they're not exactly -- "A person's genetic makeup" starts both sentences.

Q. And then?

A. But then the rest of the sentences are -- are different.

Q. Well, Dr. Safer talks about anatomy next; right?

A. Yes. He uses the word "anatomy."
Q. And then you talk -- you talk about anatomy next?
A. Yes.
Q. And you talk about "not reliable indicators of athletic performance"?
A. Yeah. I agree that the -- the theme of the sentences is the same and the first three words are the same. But the rest are not. The -- it's not verbatim the same.
Q. I'd like to now show you what I'm going to mark as Exhibit 20.

(Marked EXHIBIT 20 for identification)

BY MR. SMITH:
Q. Dr. Shumer, have you seen Exhibit 20 before?
A. I don't remember seeing Exhibit 20, but it doesn't mean that I -- that I haven't seen it. I just don't recall.
Q. Is Exhibit 20 in the Boe v. Marshall case that you also served as an expert witness in?
A. Appears to be.
Q. I'd like to direct your attention to Paragraph 22 of Exhibit 20. Paragraph 22 of Exhibit 20 reads, "Any attempts to 'cure' transgender individuals by forcing their gender identity into alignment with their assigned sex are harmful, dangerous, and ineffective.

Those practices have been denounced as unethical by all major professional associations of medical and mental health professionals, such as WPATH, the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association."

Did I read that correctly?

A. Yes.

Q. Turning to Exhibit 1, your report. Let's look at Paragraph 23. Paragraph 23 in your report reads, "Attempts to 'cure' transgender individuals by forcing their gender identity into alignment with their birth sex are harmful and ineffective. Those practices have been widely denounced as unethical by all major professional associations of medical and mental health professionals, such as the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association, among others."

Did I read that correctly?

A. Yes.

Q. Do Paragraphs 23 in your report contain virtually the same language as Paragraph 22 in Dr. Rosenthal's report?

MS. BERG: Objection. Vague.

A. Yes.
BY MR. SMITH:
Q. Let's look next at Paragraph 18 in Dr. Rosenthal's report. Dr. Rosenthal writes in Paragraph 18, "At birth, newborns are assigned a sex, either male or female, typically based solely on the appearance of their external genitalia. For most people, that assignment turns out to be accurate and their assigned sex matches that person's gender identity. However, for transgender people, their assigned sex does not align with their gender identity. This lack of alignment can create significant distress for transgender individuals."

Did I read that correctly?
A. Yes.
Q. If we look at Paragraph 25 in your report on Page 8, it reads, "When a child is born, a healthcare provider designates the child's sex as male or female based on the child's observable anatomy. For most people, that initial designation (often referred to as 'assigned sex') turns out to be consistent with the person's gender identity. For a transgender person, however, that initial designation turns out to be inaccurate because it does not reflect the person's gender identity."

Did I read that correctly?
A. Yes.
Q. Does the language that you have in Paragraph 25 also appear in Paragraph 18 of Dr. Rosenthal's report?
MS. BERG: Objection. Mischaracterizes the evidence. Vague.
A. So these are similar themes, but they're -- I would say that they're not -- they're not exactly the same.
BY MR. SMITH:
Q. Similar themes in the sense that the sentences follow the same pattern and contain the same topics as in Dr. Rosenthal's report?
MS. BERG: Objection. Mischaracterizes the evidence.
A. I think they're -- they're carrying the same message, explaining the same phenomenon.
BY MR. SMITH:
Q. Let's look at Paragraph 24 in Dr. Rosenthal's report, Exhibit 20. It reads, "Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of 'gender dysphoria,' a serious condition listed in both the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ('DSM-5') and the World Health Organization's International

Classification of Diseases ('ICD-10'), and has been recognized as such for decades. It is a condition that affects a small percentage of youth and adults."

Let's read the first sentence of your Paragraph 26. "Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of gender dysphoria, a serious medical condition recognized in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ('DSM-5-TR') and the World Health Organization's International Classification of Diseases ('ICD-10'), where it is referred to as 'gender incongruence.'"

Did I read that correctly?

A. Yes.

Q. And is that sentence I just read in your Paragraph 26 virtually identical to the same sentence in Paragraph 24 of Dr. Rosenthal's report?

MS. BERG: Objection. Vague.

A. They're very similar.

BY MR. SMITH:

Q. If we look at Paragraph 26 in Dr. Rosenthal's report, it reads, "Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and

depression, self-harm, and suicidality."

Did I read that correctly?

A. Yes.

Q. The end of Paragraph 26 in your report, "Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression, eating disorders, substance abuse, self-harm, and suicidality."

Did I read that correctly?

A. Yes.

Q. Are the two sentences I just read in your Paragraph 26 virtually identical to the same sentence in Paragraph 26 of Dr. Rosenthal's report?

MS. BERG: Objection. Vague. Mischaracterizes the evidence.

A. They're very similar.

BY MR. SMITH:

Q. Your Paragraph 26 does not include the citation to either the Spack or Olson articles that Dr. Rosenthal cites, does it?

A. It does not.

Q. If we look at Paragraph 23 in Dr. Rosenthal's report, Page 8. "For more than four decades, the goal of medical treatment for transgender patients has been to alleviate their distress by bringing their lives into

closer alignment with their gender identity."

Did I read that correctly?

A. Yes.

Q. If we read the first sentence in your Paragraph 28. "The goal of medical treatment for transgender patients is to alleviate their distress by allowing them to live consistently with their gender identity."

Did I read that correctly?

A. Yes.

Q. Are those two sentences -- the sentence in your Paragraph 28 virtually identical to the first sentence in Paragraph 23 of Dr. Rosenthal's report?

A. They're very similar.

Q. If we read the last sentence in Paragraph 23 of Dr. Rosenthal's report. "As discussed in more detail in the following section, and in the declaration of Dr. Hawkins, research and clinical experience have consistently shown these [sic] treatments to be safe, effective, and critical to the health and well-being of transgender patients."

Did I read that correctly?

A. Yes.

Q. The second sentence of your Paragraph 28. "Research and clinical experience have consistently shown the medical treatments for gender dysphoria to be safe and

effective."

Did I read that correctly?

A. Yes.

Q. The language in your Paragraph 28 all comes from the same language in Paragraph 23 of Dr. Rosenthal's report, doesn't it?

MS. BERG: Objection. Vague. Mischaracterizes the evidence.

A. Very similar.

BY MR. SMITH:

Q. Let's turn to Paragraph 27 of Dr. Rosenthal's report. Do you see the sentence that reads "The prevailing standards of care for the treatment of gender dysphoria are developed by WPATH, which has been recognized as the standard-setting organization for the treatment of gender dysphoria for more than forty years."

Did I read that correctly?

A. Yes.

Q. If you read the first sentence of your Paragraph 29. "The prevailing standards of care for the treatment of dysphoria are developed by WPATH."

Did I read that correctly?

A. Yes.

Q. Are those -- the sentence Paragraph 29 in your report

identical to the words in the first part of the sentence in Paragraph 27 of Dr. Rosenthal's report?

A. Yes.

Q. If we look next at Paragraph 29 in Dr. Rosenthal's report. We read, "Together, the SOC and the Endocrine Society's clinical practice guidelines constitute the prevailing standards guiding the healthcare and treatment of gender dysphoria."

Did I read that correctly?

A. Yes.

Q. We then write -- read throughout the rest of Paragraph 29 the process by which those guidelines were developed; right?

A. Yes.

Q. If we look at Paragraph 30 of Dr. Rosenthal's report, we see that "The major professional associations of medical and mental health providers in the United States, including the American Medical Association, American Academy of Pediatrics, American Psychiatric Association, American Psychological Association, and Pediatric Endocrine Society, treat those documents as the prevailing standards guiding the healthcare and treatment of gender dysphoria."

Did I read that correctly?

A. Yes.

Q. If we read the last sentence of your Paragraph 29, we read, "These standards have been endorsed by the major professional associations of medical and mental health providers in the United States, including the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, the American Psychological Association, and the Pediatric Endocrine Society."

Did I read that correctly?

A. Yes.

Q. You used the word "endorsed" instead of prevailing standards, but otherwise are those sentences virtually identical between your Paragraph 29 and Rosenthal's Paragraph 30?

MS. BERG: Objection. Mischaracterizes the evidence and vague.

A. They're similar.

BY MR. SMITH:

Q. If you look at Dr. Rosenthal's Paragraph 28. The first sentence reads, "The Endocrine Society is a 100-year-old global membership organization representing professionals in the field of adult and pediatric endocrinology."

Did I read that correctly?

A. Yes.

Q. The first sentence of your Paragraph 30 says, "The Endocrine Society is a 100-year-old global membership organization representing professionals in the field of adult and pediatric endocrinology."

Did I read that correctly?

A. Yes.

Q. Are those two sentences identical?

A. Yes.

Q. The second sentence of Dr. Rosenthal's Paragraph 28 reads, "In 2017, the Endocrine Society published its second clinical practice guidelines on treatment recommendations for the medical management of gender dysphoria, in collaboration with Pediatric Endocrine Society, the European Societies for Endocrinology and Pediatric Endocrine Society, and WPATH, among others."

Did I read that correctly?

A. Yes.

Q. The second sentence of your Paragraph 30 reads, "In 2017, the Endocrine Society published clinical practice guidelines on treatment recommendations for the medical management of gender dysphoria, in collaboration with the Pediatric Endocrine Society, the European Societies for Endocrinology and Pediatric Endocrinology, and WPATH, among others."

Did I read that correctly?

A. Yes.
Q. Are those two sentences identical?
MS. BERG: Objection. Vague.
A. They're either identical or very similar.
BY MR. SMITH:
Q. I jumped ahead of myself earlier. The first sentence in Paragraph 29 of Dr. Rosenthal's report says, "Together, the SOC and the Endocrine Society's clinical practice guidelines constitute the prevailing standards guiding the healthcare and treatment of gender dysphoria."
Did I read that correctly?
A. Yes.
Q. Paragraph 31 in your report says, "Together, the WPATH Standards of Care and the Endocrine Society's clinical practice guidelines establish the prevailing standards governing the healthcare and treatment of gender dysphoria in both youth and adults."
Did I read that correctly?
A. Yes.
Q. Is your Paragraph 31 virtually identical to Paragraph 29 in Dr. Rosenthal's report?
MS. BERG: Objection. Vague and mischaracterizes the evidence.
A. Yes. They're similar.

BY MR. SMITH:

Q. Paragraph 32 of Dr. Rosenthal's report reads, "Undergoing treatment to alleviate gender dysphoria is commonly referred to as a transition."

Did I read that correctly?

A. Yes.

Q. Paragraph 32 in your report says, "Undergoing treatment to alleviate gender dysphoria is commonly referred to as transition."

Did I read that correctly?

A. Yes.

Q. Is the only difference between the two sentences the word "a" between "as" and "transition" at the end of that sentence?

A. Yes.

Q. Paragraph 32 of Dr. Rosenthal's report, second sentence reads, "The transition process typically includes one or more of the following three components: social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical transition, including puberty-delaying medication and hormone-replacement therapy; and (iii) surgical transition, including surgeries to alter the appearance and functioning of primary- and

secondary-sex characteristics."

Did I read that correctly?

A. Yes.

Q. Second sentence of your Paragraph 32. "Undergoing treatment to" -- let me start over. The second sentence. "The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical transition, including puberty-suppressing medication (also sometimes referred to as puberty-blocking medication) and hormone-replacement therapy; and (iii) for adults, surgeries to alter the appearance and functioning primary- and secondary-sex characteristics."

Did I read that correctly?

A. Yes.

Q. Is Number 1 in your second sentence of Paragraph 32 the same as Number 1 in the second sentence of Dr. Rosenthal's Paragraph 32?

A. Yes.

Q. In Number 2, the only difference between your paragraph and Dr. Rosenthal's paragraph is your parenthetical referring to puberty blocking medication; is that right?

A. Yes.
Q. In Number 3 you make clear that surgery is only for adults, which is different than Dr. Rosenthal's Number 3, is it not?
A. Yes.
Q. If we turn to Paragraph 36 in Dr. Rosenthal's report, we read in the -- let's look at the second sentence, for example, on Paragraph 36. "For example, a transgender girl (someone designated male at birth with a female gender identity) will experience no progression of physical changes caused by testosterone, including facial and body hair, an Adam's apple, a deepened voice, or masculinized facial structure. And in a transgender boy (someone designated female at birth with a male gender identity), those medications would prevent progression of breast development, menstruation, and widening of the hips."

Did I read those two sentences correctly?
A. Yes.
Q. If you look at your Paragraph 33 starting in the second sentence. "For example, a transgender girl will experience no progression of physical changes caused by testosterone, including male muscular development, facial and body hair, an Adam's apple, or

masculinized facial structures. And in a transgender boy, puberty-suppressing medication will prevent breast development, menstruation, and widening of the hips."

Did I read that correctly?

A. Yes.

Q. Other than the explanations of what a transgender girl and a transgender boy are, are those two sentences virtually identical from your Paragraph 34 -- or 33 with Dr. Rosenthal's Paragraph 36?

MS. BERG: Objection. Vague. Mischaracterizes the evidence.

A. They're similar.

BY MR. SMITH:

Q. If we look at Dr. Rosenthal's Paragraph 39, we see a discussion of hormone replacement therapy, and we see in the second sentence of Dr. Rosenthal's Paragraph 39 -- third sentence, I'm sorry, "The result of this treatment is that a transgender boy has the same typical levels of circulating testosterone as his nontransgender male peers."

Did I read that correctly?

A. Yes.

Q. If I read the third sentence in your Paragraph 34, it reads, "The result of this treatment is that a

transgender boy typically has the same levels of circulating testosterone as other boys."

Did I read that correctly?

A. Yes.

Q. Is your sentence in Paragraph 34 that I just read virtually identical to the sentence in Paragraph 39 of Dr. Rosenthal's report that I read?

MS. BERG: Objection. Vague. Mischaracterizes the evidence.

A. It's similar.

BY MR. SMITH:

Q. The next sentence in Dr. Rosenthal's Paragraph 39 reads, "Similarly, a transgender girl will have the same typical levels of circulating estrogen as her nontransgender female peers."

Did I read that correctly?

A. Yes.

Q. The last sentence of your Paragraph 34 also begins, "Similarly, a transgender girl who receives hormone therapy will typically have the same levels of circulating estrogen and testosterone levels as other girls and significantly lower than boys who have begun pubertal development."

Did I read that correctly?

A. Yes.

Q. Is part of your sentence that I just read in Paragraph 34 prior to the word "and" virtually identical to the sentence I read in Paragraph 39 of Dr. Rosenthal's report?
A. It's similar, yes.
Q. So, Dr. Shumer, of the paragraphs we read in your report, Exhibit 1, none of those paragraphs cited Dr. Safer's report that we marked as Exhibit 19, did it?
A. No.
Q. None of the paragraphs in your Exhibit 1 cited Dr. Rosenthal's report that we marked as Exhibit 20, did they?
A. No.
Q. So, Dr. Shumer, help me. How did so many identical or virtually identical passages from Dr. Safer's report and Dr. Rosenthal's report end up in your report, Exhibit 1?

MS. BERG: Objection. Vague. Mischaracterizes the evidence.

A. Well, I guess I can start by thinking about Dr. Rosenthal's report. As -- as I -- as I remember it, he was first retained to represent the plaintiffs in -- in Alabama and then stepped away from that, and I was then subsequently retained to -- to be the

end -- the pediatric endocrinology expert in that case, and -- and so while I didn't remember reading the Rosenthal report prior to writing this report, I -- I can -- I can imagine that I incorporated elements of that report in writing the Alabama report which formed a general structure for the introduction to these topics in the report for this case. And in thinking through how I was wanting to present information around puberty and testosterone as it relates to sports, it certainly seems that I was inspired by some of the points that Dr. Safer made but that not citing those in my report is something that I should have done.

BY MR. SMITH:

Q. Is it your common practice when preparing an expert report to copy material wholesale from another expert and pass it off as your own?

MS. BERG: Objection.

A. It's certainly not something that I -- that I am currently doing or that I think is the best way to prepare an expert report, but I don't dispute that the -- some of the materials and inspiration for my report came from the review of colleagues that share similar opinions.

BY MR. SMITH:

Q. In your response to my last question, you said that you should have cited Dr. Safer and Dr. Rosenthal's report; is that right?
A. Yes.
Q. Why do you think now you should have cited the reports in your expert report?
A. Because I believe that that's the right thing to do when -- when there's material that -- that was initially written by someone else that you're using to make a similar point.
Q. Do you think it was a mistake not to cite Dr. Safer or Dr. Rosenthal in Exhibit 1, your report?
A. Yes. I wish that I had.
Q. Earlier and throughout the day you told me that you wrote Exhibit 1 and that those were your words. Do you remember that?
A. Yes.
MS. BERG: Objection. Mischaracterizes the testimony.
A. I did.
BY MR. SMITH:
Q. Do you think you should change that answer now?
A. I -- I stand by the fact that I'm the author of the report but certainly can see through the process of going through some of those paragraphs that some of

the words that -- that made up some of the paragraphs were taken from or inspired by the reports from Dr. Safer or Dr. Rosenthal.

Q. Before we started going through the reports line by line, I asked you, and I'm going to ask you again, did you plagiarize Dr. Safer's report in Exhibit 1, your report?

MS. BERG: Objection. Vague. Irrelevant. Okay.

A. While I stand by the material from my report, I should have cited the paragraphs that you outlined. Whether that constitutes plagiarism, I don't -- I don't know the answer to that, if that's a legal term or a term that -- that -- that -- that I have a clear definition for, but -- but those materials should have been cited differently.

BY MR. SMITH:

Q. Let's use the definition that you gave me for plagiarism. Do you think that what we just saw between the Safer and Rosenthal reports in your Exhibit 1 satisfies your own definition for plagiarism?

MS. BERG: Objection. Mischaracterizes the testimony.

A. I think it's -- it's close enough to plagiarism that I

wish I would have cited the materials differently.
BY MR. SMITH:
Q. But that's not an answer to my question. Using your definition of plagiarism that you gave me at the start of this hour, do you think what we see in Exhibit 1 plagiarized Dr. Safer's report and Dr. Rosenthal's report?
MS. BERG: Objection. Asked and answered.
MR. SMITH: It's a yes or no and I haven't gotten a yes or a no.
A. I'm not sure --
MS. BERG: Objection. He's already answered the question. It's time to move on.
A. I think I'll -- I'll keep it there.
BY MR. SMITH:
Q. So you're not going to answer yes or no to my question?
MS. BERG: Objection. It got asked and answered. It's time to move on.
A. Correct.
BY MR. SMITH:
Q. And I know your attorney is saying to move on, but I haven't got an answer to my question. I'm entitled to that. Asked and answered isn't an appropriate deposition objection.

A. I don't re -- I don't recall what -- what my definition was. I don't know if that can be read back to me or if you -- if you recall.

MR. SMITH: Cheri, how hard is it to go back and find the answer to that question? Which would have been about five minutes into this session.

MS. BERG: We can -- do you want to take a break?

MR. SMITH: I don't want to take a break. I want to complete this line of questioning.

MS. BERG: Okay. I have to run to the bathroom, so can I go run to the bathroom? Take a break. Five minutes.

MR. SMITH: I want to get an answer to this question. You're welcome to leave, but I need to get an answer to this question before we coach the witness.

MS. BERG: Okay. Well, I have to go to the bathroom, so --

MR. SMITH: Can we just stay on the record, then? I won't ask any questions while you're gone.

MS. BERG: Stay on the record while I run to the bathroom? Okay. We can keep -- we can keep going. How much longer is this line of questioning?

MR. SMITH: Five minutes.

Cheri, I'll continue, just so you don't have to keep looking. Thank you for trying.

All right. The way I'll fix this is I'll mark Exhibit 21.

(Marked EXHIBIT 21 for identification)

BY MR. SMITH:

Q. Dr. Shumer, I've handed you Exhibit 21. Do you recognize Exhibit 21?

A. I don't think I've read it before, no.

Q. Do you see the University of Michigan at the top?

A. Yes.

Q. Do you see on the left-hand side it says "U-M Standard Practice Guide"?

A. Yes.

Q. Are you familiar with the Standard Practice Guide at the University of Michigan?

A. I don't think I've -- I've read it before, but I am aware of its existence.

Q. Is it a document that contains university policies and procedures governing staff and students at the University of Michigan?

MS. BERG: Objection to the use of this document. It's not authenticated. The witness has never seen it before. Yeah.

A. That's probably true. I just -- I'm not familiar with

it.
BY MR. SMITH:
Q. Okay. In Section B of Exhibit 21, do you see "Definition of Research Misconduct"?
A. Yes.
Q. Do you see research misconduct is defined as fabrication, falsification, and plagiarism? Did I read that correctly?
A. Yes.
Q. In B-3 you see it says, "Plagiarism: the appropriation of another person's ideas, processes, results, or words without giving appropriate credit."
Did I read that correctly?
A. Yes.
Q. Under this definition, do you think that your report, Exhibit 1, plagiarized Exhibit 19 and 20 of Dr. Safer and Dr. Rosenthal?
MS. BERG: Objection. This document is not relevant in regards to research. This case is not research or published scholarship. And my other objection remains to the document. This is not authenticated. There's no website on here. There's no time that it was accessed.
BY MR. SMITH:
Q. If you look at the second page, there are last updated

dates at the bottom of the page. Do you see that, Dr. Shumer?

A. Yes.

Q. Do you see it says October 6th, 2020?

A. Yes.

Q. Do you see the owner is the Office of the Vice President for Research, University of Michigan Office of Research?

A. Yes.

MS. BERG: Again, objection. I still object. There's no date as to when this was accessed. Whether it's still operative is unclear. Unclear that this is even from the University of Michigan.

A. So in answer to your question, you know, I think that while I don't believe that an expert report necessarily constitutes research and -- and that -- that this U of M Standard Practice Guideline may or may not be applicable to an expert report. Also, as an expert in this case, I'm not performing duties related to my role in the University of Michigan. All that being said, I think that it's clear that some of the words I used were used from other sources without appropriate credit and that that meets this definition. If it were related to research, then I would say yes and I should have cited the materials,

as I said before.
BY MR. SMITH:
Q. Thank you.
MR. SMITH: Off the record.
VIDEO TECHNICIAN: Going off the video record. The time is now 5:00 p.m.
(Recess taken at 5:00 p.m.)
(Back on the record at 5:07 p.m.)
VIDEO TECHNICIAN: Back on the video record. The time is now 5:07 p.m.
BY MR. SMITH:
Q. Dr. Shumer, just a few topics to cover before we're done today.
I'd like to talk with you about first your knowledge of the plaintiffs.
Have you spoken to any of the plaintiffs in this case?
A. No.
Q. Have you spoken to any of the plaintiffs' family members in this case?
A. No.
Q. Have you ever medically examined plaintiffs?
A. No.
Q. Have you ever seen plaintiffs?
A. No.

Q. Have you ever observed plaintiffs playing sports?
A. No.
Q. Have you reviewed the medical records for the plaintiffs in this case?
A. No.
Q. Do you know what the plaintiffs' testosterone levels were at any point in their lives?
A. No.
Q. Do you have knowledge about plaintiffs from anyone other than plaintiffs' counsel?
A. No.
Q. Have you independently verified everything that plaintiffs' counsel has told you about the plaintiffs?
A. No.
Q. Have you independently verified anything that plaintiffs' counsel has told you about the plaintiffs?
MS. BERG: Objection. Asked and answered.
A. No.
BY MR. SMITH:
Q. And just to be clear, my first question was whether you independently verified everything, and my second question is whether you've independently verified anything that plaintiffs' counsel has asked you, so it's a different question.
A. I guess I have read the Complaint, which included

information about the plaintiffs, but beyond that, no.
Q. Is it your understanding that that Complaint was prepared by plaintiffs' counsel?
A. Yes.
Q. Did you say earlier that you'd reviewed the bill in this case passed by Arizona?
A. Yes.
Q. The Save Women's Sports Act, Senate Bill 1165?
A. Yes.
Q. Your report doesn't contain any opinions about the legislative findings of Senate Bill 1165, does it?
A. I'm not sure how to answer that.
Q. Do you know what legislative findings are in Senate Bill 1165?
A. I don't know what that means.
Q. Do you know if you've reviewed legislative findings for Senate Bill 1165?
A. I've read a document that had the -- the -- the bill, but I don't -- I don't know what that -- that term means.
Q. So if the legislature explained why they passed a bill, do you know if you've seen an explanation or what's -- what's called legislative findings?
A. I believe so. It has been quite a while since I've reviewed this document that we're talking about, so

I'm not -- I'm not -- I'm not sure, but I -- I believe so if it's contained in the document that was part of the packet of information that is pertaining to the -- the case.

Q. And I haven't seen that document, so I'm not exactly sure if it was in there or not. But, nevertheless, you don't have any opinions about why the legislature in Arizona passed Senate Bill 1165, do you?

MS. BERG: Objection. Vague.

A. No. I can't comment on their like motivation.

BY MR. SMITH:

Q. And you don't have any knowledge of any of the testimony or evidence the legislature considered before it passed Senate Bill 1165?

A. No.

Q. Do you have any opinions on -- about what policy a legislature should pass when it comes to sports participation for school sports?

A. Can you say that one again?

Q. Yeah. Are you attempting to present opinions about what the right way to regulate school sports is and how the legislature should do that?

A. No.

Q. Dr. Shumer, are you on an advisory committee called Stand With Trans?

A. Yes.
Q. Is that an advocacy organization for transgender issues?
A. They run support groups for -- for patients in Southeast Michigan primarily, so they facilitate support groups, a picnic in the summer, and a lot of my patients go to some of those support groups and benefit from -- from them.
Q. Does Stand With Trans do any advocacy work such as supporting or opposing legislation?
A. If they do, they don't ask my opinion about it.
Q. Are you aware of executive orders that President Trump has signed relating to transgender issues?
A. Yes.
MS. BERG: Objection. Vague.
BY MR. SMITH:
Q. Are you aware there have been three different executive orders that President Trump has signed relating to biological sex or the treatment of gender dysphoria or participation in sports?
A. Yes.
Q. Are you familiar with those executive orders?
A. Yes.
Q. Are you an expert witness in an executive order challenging the second executive order dealing with

the use of puberty blockers and cross-sex hormones?
A. Yes.
Q. Are you an expert witness for the State of Washington in that case?
A. Yes.
Q. And are you also an expert witness in a case challenging the third executive order relating to participation in school sports?
A. No.
Q. Do you know if that issue has now been raised in the New Hampshire case in which you're an expert witness?
A. I heard that from the news.
Q. You haven't been contacted about that case since it --
A. I have not.
Q. Let me just make sure I get a clean question.
You haven't been contacted by the attorneys or parties in that case about providing expert opinions relating to that presidential executive order?
A. I have not.
Q. You're aware that after President Trump signed the executive order relating to sports that the NCAA changed their policy for participation in sports?
A. I did hear that.
Q. Are you aware that the NCAA now requires someone to

have been -- to be the biological sex of female in order to compete in female sports?

A. That's my understanding.

Q. Dr. Shumer, have you testified in a case called Voe versus Mansfield in North Carolina?

A. I participated in that case. I'm not -- I'm trying to -- I believe I was deposed but didn't testify.

Q. Were you deposed August of 2024 in Voe v. Mansfield?

A. That sounds right.

Q. In Paragraph Number 14 of Exhibit 1 -- do you have Exhibit 1 in front of you?

A. Not yet. Thank you.

Q. Paragraph 14 on Page 5, is Voe v. Mansfield listed in Paragraph 14?

A. No. Thank you for pointing that out. I'll be sure to add it in the future.

Q. Have you also been deposed in a case called Cooper versus USA Powerlifting in powerlifting, Minnesota?

A. Yes.

Q. Was that deposition within the past four years?

A. I don't -- I don't think so. And that's why I didn't include it. But I -- I could be mistaken.

Q. If it was within the past four years, should it have been located in Paragraph 14 of your report?

A. Yes.

Q. Dr. Shumer, are you a statistician?
A. No.
Q. Have you published any peer-reviewed articles on statistical methods?
A. No.
Q. Do you have a degree in statistics?
A. No.
Q. Are you board certified in endocrinology?
A. No. I'm board certified in pediatric endocrinology and pediatrics.
Q. Is your certification in pediatric endocrinology from the State of Michigan?
A. No. I'm -- I'm licensed to practice medicine in the state of Michigan, but I'm board certified in pediatric endocrinology by the American Board of Pediatrics.
Q. Do you know if the State of Michigan has a board certification for endocrinology?
A. They don't have a specific unique state designation like that.
Q. You're not a psychiatrist either?
A. No.

MR. SMITH: Thank you, Dr. Shumer. That's all the questions I have for right now.

THE WITNESS: Thank you.

MR. SMITH: Do you have any questions, Rachel?

MS. BERG: I do. Can we take a 20-minute break so I can talk to co-counsel?

MR. SMITH: 20 minutes. Off the record.

VIDEO TECHNICIAN: Going off the video record. The time is now 5:15 p.m.

(Recess taken at 5:15 p.m.)

(Back on the record at 5:25 p.m.)

VIDEO TECHNICIAN: Back on the video record. The time is 5:25 p.m.

EXAMINATION

BY MS. BERG:

Q. Dr. Shumer, can you please turn to Exhibit -- what's been marked as Exhibit 1?

A. Yes.

Q. And turn to Paragraph 12. And the second sentence of Paragraph 12 says -- or let me just read the whole -- whole thing. "In preparing this report, I reviewed the text of Senate Bill 1165 at issue in this matter. I also relied on my scientific education and training, my research experience, and my knowledge of the scientific literature in the pertinent fields. The materials I have relied upon in preparing this report are the same types of materials that experts in my

field of study regularly rely upon when forming opinions on these subjects."

Is that accurate?

A. Yes.

Q. Let's turn to Paragraphs -- Page 6, the heading "Medical and Scientific Background on Gender Identity and Gender Dysphoria."

Do your opinions I'm going to just say in this section reflect the standards of care for the treatment of gender dysphoria as reflected by the Endocrine Society Clinical Practice Guidelines and the WPATH Standards of Care 8?

A. Yes.

Q. If we can move to the next section, which is titled -- Page 9, titled "The Medical Treatment of Gender Dysphoria in Adolescents."

Do your opinions in this section reflect the Endocrine Society Clinical Practice Guidelines as well as the WPATH Standards of Care 8?

A. Yes.

Q. We talked earlier about social transition. If a -- if a transgender girl is living her life as -- living as a girl in all aspects of her life and that the social transition has been part of her treatment for gender dysphoria, would it conflict with that treatment to be

required to play on a boys' sports team?
A. Yes.
Q. Can we turn to the section in Exhibit 1, your report, the section regarding plaintiffs on Page 13, "Plaintiffs and Arizona's Ban on Transgender Girls in Sports"?
A. Yes.
Q. Are you providing an expert opinion on whether plaintiffs have a competitive advantage, athletic advantage?
A. Yes.
MR. SMITH: Object to form. Mischaracterizes earlier testimony.
BY MS. BERG:
Q. Are you an expert in parsing out what's considered fair and unfair with regards to athletic advantage in specific sports at specific grade levels?
A. No.
Q. But as you've -- your opinions in this section "Plaintiffs and Arizona's [Sports] Ban on Transgender Girls in Sports," you provide an expert opinion on whether the plaintiffs have a competitive advantage?
A. Yes.
MR. SMITH: Objection to form.
BY MS. BERG:

Q. We've talked about the normal age when it's considered normal to start puberty. What would be considered atypical age to start puberty in girls?
A. In someone assigned female at birth?
Q. Correct.
A. It would be unusual to start puberty before age 8.
Q. And what about in someone assigned male at birth?
A. Before age 9.
Q. Okay. I want to go back to the section "Medical and Scientific Background on Gender Identity and Gender Dysphoria."

Are the paragraphs in this section well established in the scientific community?

MR. SMITH: Objection to form.

A. Yes.
BY MS. BERG:
Q. Let's go to the next section, "The Medical Treatment of Gender Dysphoria in Adolescents."

Are the opinions in this section well established by the scientific community?

MR. SMITH: Object to form. Lacks foundation.

A. Yes.
BY MS. BERG:
Q. Do you stand by the expert testimony in your expert

report?
A. Yes.
Q. Do you believe that these concepts in your expert report are -- let me start over.
Do you believe that the concepts in your expert report are well supported by the scientific literature, including, but not limited to, the Endocrine Society Clinical Practice Guidelines and the WPATH Standards of Care?
MR. SMITH: Object to form. Lacks foundation.
A. Yes.
BY MS. BERG:
Q. Are all of the opinions contained in your expert report information that's well supported in pediatric endocrinology?
A. Yes.
Q. To the extent that you might have reviewed reports by Dr. Safer and Dr. Rosenthal, did you deliberately omit any statements from those reports that would have changed your findings in this case?
A. No.
MS. BERG: I have nothing further.
RE-EXAMINATION
BY MR. SMITH:

Q. Dr. Shumer, do you know if Arizona requires anyone to play school sports?

A. I do not know, but I would imagine that they don't require anyone to play school sports.

MR. SMITH: That's all I have. No further questions from me. Anything from you, Rachel?

MS. BERG: No.

VIDEO TECHNICIAN: Going off the video record. The time is now 5:32 p.m.

(Deposition concluded at 5:32 p.m.

Signature of the witness was requested.

JANE DOE, et al.,

Plaintiffs,

vs. Case No. 4:23-cv-00185-JGZ

THOMAS C. HORNE, in his official capacity as State Superintendent of Public Instruction, et al.,

Defendants.

_____/

VERIFICATION OF DEPONENT

I, having read the foregoing deposition consisting of my testimony at the aforementioned time and place, do hereby attest to the correctness and truthfulness of the transcript.

_____

DANIEL SHUMER, M.D.

Dated:

ERRATA SHEET

PAGE LINE CORRECTION

CERTIFICATE OF NOTARY

STATE OF MICHIGAN)
) SS
COUNTY OF WAYNE)

I, CHERI L. POPLIN, 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.

Cheri L. Poplin, CSR 5132, RPR, CRR
Notary Public,
Wayne County, Michigan.

My Commission expires: August 21, 2025

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EXHIBIT 2

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF ARIZONA
TUCSON DIVISION

Jane Doe, by her next friend and parents Helen Doe and James Doe; and Megan Roe, by her next friend and parents, Kate Roe and Robert Roe,

Plaintiffs,

v.

Thomas C. Horne in his official capacity as State Superintendent of Public Instruction; Laura Toenjes, in her official capacity as Superintendent of the Kyrene School District; Kyrene School District; The Gregory School; and Arizona Interscholastic Association Inc.,

Defendants,

Warren Petersen, in his official capacity as President of the Arizona State Senate, and Ben Toma, in his official capacity as Speaker of the Arizona House of Representatives,

Intervenor-Defendants.

Case No. 4:23-cv-00185-JGZ

EXPERT REPORT OF DR. DANIEL SHUMER, M.D., MPH

Qualifications and Experience

1. I am a Pediatric Endocrinologist and Medical Director of the Comprehensive Gender Services Program at Michigan Medicine, University of Michigan. I also serve as the Clinical Director of Child and Adolescent Gender Services at C.S. Mott Children's Hospital, and as an Assistant Professor of Medicine at the University of Michigan, where

the major focus of my clinical and research work pertains to transgender adolescents. A true and correct copy of my curriculum vitae is attached hereto as **Exhibit A**.

2. I received my medical degree from Northwestern University in 2008. After completing a residency in pediatrics at Vermont Children's Hospital, Fletcher Allen Health Care, University of Vermont, I began a clinical fellowship in pediatric endocrinology at Harvard University's Boston Children's Hospital. During that clinical fellowship, I completed a Master of Public Health from Harvard University's T.H. Chan School of Public Health. I finished both the fellowship and my MPH degree in 2015.

3. As a fellow at Harvard, I was mentored by Dr. Norman Spack, a pioneer in transgender medicine who established the Gender Management Services Clinic (GeMS), the first major program in the U.S. to focus on gender-diverse and transgender adolescents. GeMS is located at Boston Children's Hospital. Working at GeMS, I became a clinical expert in the field of transgender medicine within pediatric endocrinology and began conducting research on gender identity and the evaluation and management of transgender children and adolescents.

4. Based on my work at GeMS, I was recruited to establish a similar program focusing on gender-diverse and transgender children and adolescents at the C.S. Mott Children's Hospital. In October 2015, I founded the hospital's Child and Adolescent Gender Services Clinic.

5. The Child and Adolescent Gender Services Clinic has treated over 600 patients since its founding. I have personally evaluated and treated over 400 patients for gender dysphoria. As the Clinical Director, I oversee the clinical practice, which includes

four other physicians, two clinical social workers, and nursing and administrative staff. I also actively conduct research related to transgender medicine and mental health concerns specific to transgender youth.

6. In addition to my work with transgender children and adolescents, I also treat children and adolescents with differences of sex development ("DSD"), commonly referred to as intersex conditions. I participate in the DSD Clinic's monthly meetings and approximately 5% of my patients are children and adolescents with DSDs.

7. My academic duties as an assistant professor include teaching lectures entitled "Puberty," "Transgender Medicine," and "Pediatric Growth and Development." I am also the Director of the Transgender Medicine elective for the University of Michigan Medical School.

8. My recent peer-reviewed publications include *Health Disparities Facing Transgender and Gender Nonconforming Youth Are Not Inevitable*, Pediatrics, 141(3), 1–2 (2018); *Psychological Profile of the First Sample of Transgender Youth Presenting for Medical Intervention in a U.S. Pediatric Gender Center*, Psych. Sexual Orientation & Gender Diversity, 4(3), 374–82 (2017); *The Effect of Lesbian, Gay, Bisexual, and Transgender-Related Legislation on Children*, J. Pediatrics, 178(5-6.e1), 5–7 (2016); *Advances in the Care of Transgender Children and Adolescents*, Advances Pediatrics, 63(1), 79–102 (2016); *The Role of Assent in the Treatment of Transgender Adolescents*, Int'l J. Transgenderism, 16(2), 97-102 (2015); and *Serving Transgender Youth: Challenges, Dilemmas, and Clinical Examples*, Professional Psychology: Research and Practice, 46(1), 37–45 (2015). I have also co-authored chapters of textbooks, including

"Medical Treatment of the Adolescent Transgender Patient" in *Gender Affirmation: Medical and Surgical Perspectives* (Christopher J. Salgado et al. eds., 2016). A listing of my publications is included in my curriculum vitae in **Exhibit A**.

9. I have been invited to speak at numerous hospitals, clinics, and conferences on topics related to clinical care and standards for treating transgender children and youth. For example, in December 2017 I spoke at the Nursing Unit (12-West) Annual Educational Retreat in Michigan on the topic of "Gender Identity at the Children's Hospital," and in October 2017, I planned, hosted, and spoke at a conference in Michigan entitled "Transgender and Gender Non-Conforming Youth: Best Practices for Mental Health Clinicians, Educators, & School Staff."

10. In October 2019, I was invited by the Michigan Organization on Adolescent Sexual Health to speak to community groups across Southeast Michigan on the topic of "Gender Identity in Adolescents—Supporting Transgender Youth." A listing of my lectures is included in my curriculum vitae in **Exhibit A**.

11. I belong to a number of professional organizations and associations relating to (i) the health and well-being of children and adolescents, including those who are transgender; and (ii) appropriate medical treatments for transgender individuals. For example, I am currently a member of the Pediatric Endocrine Society where I serve on the Gender Identity Special Interest Group's Education Committee. A complete list of my involvement in various professional associations is located in my curriculum vitae in **Exhibit A**.

12. In preparing this report, I reviewed the text of Senate Bill 1165 ("SB 1165")

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

13. I have not met or spoken with the Plaintiffs or their parents for purposes of this report. My opinions are based solely on the information that I have been provided by Plaintiffs' attorneys as well as my extensive background and experience treating transgender patients.

14. In the past four years, I have been retained as an expert and provided testimony on behalf of transgender plaintiffs in the following cases: *Doe et al. v. Lapado et al.*, 4:23-cv-00114-RH-MAF (N.D. Fla.); *K.C. et al v. Medical Licensing Board of Indiana*, 1:23-CV-595 (S.D. Ind.); *Doe et al. v. Norman et al.*, 1:23-cv-02904-SEG (N.D. Ga.); *Noe et al. v. Parson et al.*, (Cole County, MO); *Loe et al. v. Texas et al.*, (Travis County, TX); *Roe et al. v. Herrington et al.*, 4:20-cv-00464 (D. Ariz.); *Dekker v. Weida*, No. 4:22-cv-00325-RH-MAF (N.D. Fla.); *Boe v. Marshall*, No. 2:22-cv-00184-LCB-CWB (M.D. Ala.); *Roe v. Utah High Sch. Activities Ass'n*, No. 220903262 (3d Jud. Dist., Salt Lake County, Utah); *Menefee v. City of Huntsville Bd. of Educ.*, No. 5:18-cv-01481-LCB (N.D. Ala.); *Flack v. Wis. Dep't of Health Servs.*, No. 3:18-cv-00309-wmc (W.D. Wis.); *Whitaker v. Kenosha Unified Sch. Dist. No. 1 Bd. of Educ.*, No. 2:16-cv-00943-PP (E.D.

Noe v. Marshfield

Wis.). I also provided expert witness testimony on behalf of a parent in a custody dispute involving a transgender child in the following case: *In the Interest of Younger*, No. DF-15-09887 (Dallas County, Tex.).

15. I am being compensated at an hourly rate for the actual time that I devote to this case, at the rate of $300 per hour for any review of records, preparation of reports, or declarations. I will be compensated with a day rate of $1,920 for deposition and trial testimony. My compensation does not depend on the outcome of this litigation, the opinions that I express, or the testimony that I provide.

Medical and Scientific Background on Gender Identity and Gender Dysphoria

16. "Gender identity" is the medical term for a person's internal, innate sense of belonging to a particular sex. Everyone has a gender identity.

17. A person's gender identity has a strong biological basis. Research suggests that differences in prenatal hormonal exposures, genetic factors, and brain structural differences may all contribute.[1]

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[1] Charles E. Roselli, *Neurobiology of Gender Identity and Sexual Orientation*, 30(7) J Neuroendocrinol. e12562 (2018); Stephen M. Rosenthal, *Approach to the Patient: Transgender Youth: Endocrine Considerations*, 99(12) J Clin Endocrinol Metab. 4379–89 (2014); Gunter Heylens, et al., *Gender Identity Disorder in Twins: A Review of the Case Report Literature*, 9(3) *J Sex Med*. 751–57 (2012); Giuseppina Rametti, et al., *White Matter Microstructure in Female to Male Transsexuals Before Cross-Sex Hormonal Treatment. A Diffusion Tensor Study*, 45(2) J Psychiatr Res. 199–204 (2011); Eileen Luders, et al., *Regional Gray Matter Variation in Male-to-Female Transsexualism*, 46(4) Neuroimage 904–07 (2009); H. Berglund, et al., *Male-to-Female Transsexuals Show Sex-Atypical Hypothalamus Activation When Smelling Odorous Steroids*, 18(8) Cereb. Cortex 1900–08 (2008); Arianne B. Dessens, et al., *Gender Dysphoria and Gender Change in Chromosomal Females with Congenital Adrenal Hyperplasia*, 34(4) *Arch Sex Behav*. 389–97 (2005); Susanne Henningsson, et al., *Sex Steroid-Related Genes and Male-to-Female Transsexualism*, 30(7) Psychoneuroendocrinology 657–64 (2005); Wilson C.J. Chung, et

18. The terms "gender role" and "gender identity" refer to different things.

19. Gender roles are behaviors, attitudes, and personality traits that a particular society considers masculine or feminine, or associates with male or female social roles. For example, the convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are socially constructed gender roles from a particular culture and historical period.

20. By contrast, gender identity is an internal and biologically influenced phenomenon. It does not refer to socially contingent behaviors, attitudes, or personality traits.

21. A person's gender identity is innate and cannot be changed, including by medical or psychological intervention.

22. Living consistently with one's gender identity is critical to the health and well-being of any person, including transgender people.

23. Attempts to "cure" transgender individuals by forcing their gender identity into alignment with their birth sex are harmful and ineffective. Those practices have been widely denounced as unethical by all major professional associations of medical and mental health professionals, such as the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association, among others.

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al., *Sexual Differentiation of the Bed Nucleus of the Stria Terminalis in Humans May Extend Into Adulthood*, 22(3) J Neurosci. 1027–33 (2002).

24. From a medical perspective, a person's sex is comprised of several components, including, among others, internal reproductive organs, external genitalia, chromosomes, hormones, gender identity, and secondary-sex characteristics. Diversity and incongruence in these components of sex are a naturally occurring source of human biological diversity.

25. When a child is born, a healthcare provider designates the child's sex as male or female based on the child's observable anatomy. For most people, that initial designation (often referred to as "assigned sex") turns out to be consistent with the person's gender identity. For a transgender person, however, that initial designation turns out to be inaccurate because it does not reflect the person's gender identity.

26. Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of gender dysphoria, a serious medical condition recognized in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* ("DSM-5-TR") and the World Health Organization's *International Classification of Diseases* ("ICD-10"), where it is referred to as "gender incongruence." Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression, eating disorders, substance abuse, self-harm, and suicidality.

27. When transgender adolescents are provided with appropriate medical treatment and have parental and social support, they can thrive and grow into healthy adults.

The Medical Treatment of Gender Dysphoria in Adolescents

28. The goal of medical treatment for transgender patients is to alleviate their distress by allowing them to live consistently with their gender identity. Research and clinical experience have consistently shown the medical treatments for gender dysphoria to be safe and effective.[2]

29. The prevailing standards of care for the treatment of gender dysphoria are developed by WPATH. The WPATH Standards of Care represent expert consensus for

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[2] *See, e.g.*, Diana M. Tordoff et al., *Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Gender-Affirming Care*, 5 Jama Network Open at 1 (2022) (finding that receipt of medical care, including puberty blockers and gender-affirming hormones, was associated with 60% lower odds of moderate or severe depression and 73% lower odds of suicidality over a 12-month follow-up); Amy E. Green et al., *Association of Gender-Affirming Hormone Therapy with Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth*, 70 J. Adolescent Health [ePublication ahead of print] at 1 (2021) (finding that access to hormone therapy during adolescence was associated with lower odds of recent depression and having attempted suicide in the past year); Jack L. Turban et al., *Pubertal Suppression for Transgender Youth and Risk of Suicidal Ideation*, 145 Pediatrics at 1 (2020) (finding that access to puberty blockers during adolescence is associated with a decreased lifetime incidence of suicidal ideation among adults); Christal Achille et al., *Longitudinal Impact of Gender-affirming Endocrine Intervention on the Mental Health and Well-Being of Transgender Youths: Preliminary results*, Int'l J. Pediatric Endocrinology at 1 (2020) (finding that endocrine intervention was associated with decreased depression and suicidal ideation and improved quality of life for transgender youth); Laura E. Kuper et al., *Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy*, 145 Pediatrics at 1 (2020) (showing hormone therapy in youth is associated with reducing body dissatisfaction and modest improvements in mental health); Anna I.R. van der Miesen et al., *Psychological Functioning in Transgender Adolescents Before and After Gender-Affirmative Care Compared with Cisgender General Population Peers*, 66 J. Adolescent Health 699–704 (2020) (showing fewer emotional and behavioral problems after puberty suppression and similar or fewer problems compared to same-age non-transgender peers); Rosalia Costa et al., *Psychological Support, Puberty Suppression, and Psychosocial Functioning in Adolescents with Gender Dysphoria*, 12 J. Sexual Medicine at 2206 (2015) (finding increased psychological function after six months of puberty suppression).

clinicians related to medical care for transgender people, based on the best science and clinical experience. The WPATH Standards of Care were first published in 1979, more than four decades ago, and have been continually updated to reflect new knowledge and research. These standards have been endorsed by the major professional associations of medical and mental health providers in the United States, including the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, the American Psychological Association, and the Pediatric Endocrine Society.

30. The Endocrine Society is a 100-year-old global membership organization representing professionals in the field of adult and pediatric endocrinology. In 2017, the Endocrine Society published clinical practice guidelines on treatment recommendations for the medical management of gender dysphoria, in collaboration with the Pediatric Endocrine Society, the European Societies for Endocrinology and Pediatric Endocrinology, and WPATH, among others.

31. Together, the WPATH Standards of Care and the Endocrine Society's clinical practice guidelines establish the prevailing standards governing the healthcare and treatment of gender dysphoria in both youth and adults.

32. Undergoing treatment to alleviate gender dysphoria is commonly referred to as transition. The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical transition, including puberty-suppressing medication (also sometimes referred to as puberty-blocking medication) and hormone-replacement therapy; and (iii) for adults, surgeries to alter the appearance and

functioning primary- and secondary-sex characteristics. Surgery is rarely indicated for transgender minors.

33. At the onset of puberty, adolescents diagnosed with gender dysphoria may be prescribed puberty-suppressing medications (gonadotrophin-releasing hormone agonists or GnRHa) to prevent the distress of developing physical characteristics that conflict with the adolescent's gender identity. For example, a transgender girl will experience no progression of physical changes caused by testosterone, including male muscular development, facial and body hair, an Adam's apple, or masculinized facial structures. And in a transgender boy, puberty-suppressing medication will prevent breast development, menstruation, and widening of the hips.

34. Thereafter, the treating provider may prescribe cross-sex hormones to induce the puberty associated with the adolescent's gender identity. This treatment is referred to as hormone therapy. The result of this treatment is that a transgender boy typically has the same levels of circulating testosterone as other boys. Similarly, a transgender girl who receives hormone therapy will typically have the same levels of circulating estrogen and testosterone levels as other girls and significantly lower than boys who have begun pubertal development.

Sports and Gender

35. Being transgender is not an accurate proxy for athletic performance or ability. Sex chromosomes and genitals alone do not meaningfully affect athletic performance.

36. Before puberty, girls and boys generally perform at the same level with some

small differences at the margins (some favoring boys, some favoring girls). In contrast, post-pubertal boys as a group generally begin to show a significant athletic advantage over post-pubertal girls due to their exposure over time to the elevated levels of testosterone associated with male puberty.

37. The biological driver of these average group differences is testosterone, not anatomy or genetics. Both boys and girls produce testosterone. After puberty, however, boys produce much higher levels of testosterone than girls, which results in increased muscle mass and muscle strength. As a result, post-pubertal boys and men have an athletic advantage over girls and women in many sports.[3]

38. Setting aside the narrow category of individuals with DSDs,[4] the ranges of testosterone in males and females do not overlap with each other.

39. There are transgender girls and women who have testosterone in the female range because they are receiving hormone therapy or because, as a result of receiving puberty-suppressing medication, they never have gone through male puberty.

40. The fact that a girl is transgender, in itself, does not indicate that she has any athletic advantage over other girls.

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[3] *See, e.g.*, David J. Handelsman, et al., *Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance*, 39 Endocrine Revs. 803–29 (2018).

[4] DSD includes a group of congenital conditions associated with atypical development of internal and external genital structures. These conditions are caused by variations in genes, development in utero, or hormones. Some women who have certain disorders of sexual development may produce levels of testosterone that are typically seen only in men.

Plaintiffs and Arizona's Ban on Transgender Girls in Sports

41. There is no medical justification for Arizona to exclude Plaintiffs from girls' sports teams because they are transgender.

42. Plaintiffs' attorneys have explained to me that Plaintiff Jane Doe is a 12-year-old transgender girl who was diagnosed with gender dysphoria when she was about seven years old and has lived her life as a girl since that time.

43. As part of her medical treatment for gender dysphoria, Jane started to receive puberty-suppressing medication when she was 11 years old. As a result, Jane has not experienced any of the physiological changes that increased testosterone levels would cause in a pubescent boy.

44. Plaintiffs' attorneys have explained to me that Plaintiff Megan Roe is a 16-year-old transgender girl who was diagnosed with gender dysphoria when she was about 10 years old and has lived as a girl since that time.

45. As part of her medical treatment for gender dysphoria, Megan started to receive puberty-suppressing medication when she was 11 years old after clinical documentation of the initial signs of puberty. This medication prevented her from undergoing male puberty. Megan then started to receive hormone therapy when she was 12 years old. As a result, she has not experienced any of the physiological changes, including muscle development, that increased testosterone levels would cause in a pubescent boy. Instead, the hormone therapy she has received has caused her to develop many of the physiological changes associated with puberty in females.

46. SB 1165 suggests that biological "sex is determined at [fertilization] and

revealed at birth or . . . *in utero*." S.B. 1165, 55th Leg., 2d Reg. Sess. (Ariz. 2022), § 2.

47. By suggesting sex to mean only biological sex determined at fertilization and revealed in utero or at birth, Arizona prevents Plaintiffs from participating on girls' teams because they are transgender girls. But the biological driver of average differences in athletic performance between men and women is circulating testosterone—not a person's transgender status or their biological sex determined at fertilization and revealed in utero or at birth. A person's genetic makeup and anatomy at birth alone are not reliable indicators of athletic performance.

48. Because both Jane and Megan have not experienced increased testosterone levels that accompany male puberty, they do not have the biological characteristics that could, over time, cause them to have an athletic advantage over other girls in some sports.

49. In addition, requiring Plaintiffs to participate on a boys' team would conflict with the standards of care for treating gender dysphoria in adolescents. Such a requirement would be harmful to Plaintiffs' mental, emotional, and physical health.

50. I declare under criminal penalty under the laws of Arizona that the foregoing is true and correct.

Signed on the 10th day of October, 2024, in Ann Arbor, Michigan.

Daniel Shumer, M.D.

EXHIBIT A

Daniel Shumer

Clinical Associate Professor
dshumer@umich.edu

Education and Training

Education

08/2000-08/2003	BA, Northwestern University, Evanston, IL
08/2004-05/2008	MD, Northwestern University, Feinberg School of Medicine, Chicago, IL
07/2013-05/2015	MPH, Harvard T.H. Chan School of Public Health, Boston, MA

Postdoctoral Training

06/2008-06/2011	Residency, Pediatrics, Vermont Children's Hospital at Fletcher Allen Health Care, Burlington, VT
07/2011-06/2012	Chief Resident, Chief Resident, Vermont Children's Hospital at Fletcher Allen Health Care, Burlington, VT
07/2012-06/2015	Clinical Fellow, Pediatric Endocrinology, Boston Children's Hospital, Boston, MA

Certification And Licensure

Certification

10/2011-Present	American Board of Pediatrics, General

Licensure

08/2015-Present	Michigan, Medical License
09/2015-Present	Michigan, DEA License
09/2015-Present	Michigan, Controlled Substance

Work Experience

Academic Appointment

10/2015-09/2022	Clinical Assistant Professor in Pediatrics - Endocrinology, University of Michigan - Ann Arbor, Ann Arbor
09/2022-Present	Clinical Associate Professor in Pediatrics - Endocrinology, University of Michigan - Ann Arbor, Ann Arbor

Administrative Appointment

07/2019-01/2023	Fellowship Director - Pediatric Endocrinology, Michigan Medicine, Department of Pediatrics, Ann Arbor
07/2020-Present	Medical Director of the University of Michigan Comprehensive Gender Services Program, Oversee the provision of care to transgender and gender non-conforming patients at Michigan Medicine, Michigan Medicine, Ann Arbor
07/2020-01/2023	Education Lead - Pediatric Endocrinology, University of Michigan - Department of Pediatrics, Ann Arbor

Private Practice

08/2013-09/2015	Staff Physician, Harvard Vanguard Medical Associates, Braintree

Research Interests

- Gender dysphoria
- Prader Willi Syndrome

Clinical Interests

- Gender dysphoria
- Disorders of Sex Development
- Prader Willi Syndrome

Honors and Awards

National

2014	Annual Pediatric Endocrine Society Essay Competition: Ethical Dilemmas in Pediatric Endocrinology: competition winner - The Role of Assent in the Treatment of Transgender Adolescents

Institutional

2012 - 2015	Harvard Pediatric Health Services Research Fellowship; funded my final two years of pediatric endocrine fellowship and provided tuition support for my public health degree
2016	The University of Michigan Distinguished Diversity Leaders Award, awarded by The Office of Diversity, Equity and Inclusion to the Child and Adolescent Gender Services Team under my leadership
2019	Lecturer of the Month, Department of Pediatrics, Michigan Medicine

Teaching

Mentorship

Resident

07/2020-Present	Rebecca Warwick, Michigan Medicine

Clinical Fellow

07/2017-06/2020	Adrian Araya, Michigan Medicine
12/2020-Present	Jessica Jary, Michigan Medicine - Division of Adolescent Medicine

Medical Student

09/2017-06/2020	Michael Ho, Michigan Medicine
07/2019-06/2020	Jourdin Batchelor, University of Michigan
07/2019-06/2020	Hadrian Kinnear, University of Michigan Medical School

Teaching Activity

Regional

08/2018-08-2019	Pediatric Boards Review Course sponsored by U-M: "Thyroid Disorders and

	Diabetes". Ann Arbor, MI
06/2023-Present	Care for Transgender Children and Adolescents, Wayne State University School of Social Work, Guest Lecturer
10/2023-Present	Care for Transgender Children and Adolescents, Stand With Trans, Guest Lecturer

Institutional

12/2015-12/2015	Pediatric Grand Rounds: "Transgender Medicine - A Field in Transition". Michigan Medicine, Ann Arbor, MI
02/2016-02/2016	Psychiatry Grand Rounds: "Transgender Medicine - A Field in Transition". Michigan Medicine, Ann Arbor, MI
02/2016-02/2016	Medical Student Education: Panelist for M1 Class Session on LGBT Health, Doctoring Curriculum. Michigan Medicine, Ann Arbor, MI
03/2016-03/2017	Pharmacy School Education: "LGBT Health". University of Michigan School of Pharmacy, Ann Arbor, MI
04/2016-Present	Course Director: Medical Student (M4) Elective in Transgender Medicine. Michigan Medicine, Ann Arbor, MI
04/2016-04/2016	Rheumatology Grand Rounds: "Gender Identity". Michigan Medicine, Ann Arbor, MI
05/2016-05/2016	Lecture to Pediatric Rheumatology Division: "Gender Dysphoria". Michigan Medicine, Ann Arbor, MI
07/2016-07/2016	Internal Medicine Resident Education: "Gender Identity". Michigan Medicine, Ann Arbor, MI
09/2016-09/2016	Presentation to ACU Leadership: "Gender Identity Cultural Competencies". Michigan Medicine, Ann Arbor, MI
10/2016-10/2016	Presentation to Department of Dermatology: "The iPledge Program and Transgender Patients". Michigan Medicine, Ann Arbor, MI
02/2017-02/2017	Presentation at Collaborative Office Rounds: "Transgender Health". Michigan Medicine, Ann Arbor, MI
02/2017-02/2017	Lecture to Division of General Medicine: "Transgender Health". Michigan Medicine, Ann Arbor, MI
02/2017-02/2017	Swartz Rounds Presenter. Michigan Medicine, Ann Arbor, MI
10/2017-10/2017	Family Medicine Annual Conference: "Transgender Medicine". Michigan Medicine, Ann Arbor, MI
12/2017-12/2017	Presenter at Nursing Unit 12-West Annual Educational Retreat: "Gender Identity at the Children's Hospital". Michigan Medicine, Ann Arbor, MI
02/2018-Present	Pediatrics Residency Lecturer: "Puberty". Michigan Medicine, Ann Arbor, MI
02/2019-Present	Doctors of Tomorrow Preceptor: offering shadowing opportunities to students from Cass Technical High School in Detroit. Michigan Medicine, Ann Arbor, MI
02/2019-Present	Medical Student (M1) Lecturer: "Pediatric Growth and Development". Michigan Medicine, Ann Arbor, MI
03/2019-03/2019	Lecture to Division of Orthopedic Surgery: "Transgender Health". Michigan Medicine, Ann Arbor, MI
04/2023-Present	Guest Lecturer in Woman and Gender Studies 400 undergraduate course, University of Michigan
07/2023-Present	Care for Transgender Children and Adolescents, University of Michigan School of Nursing, Pediatric Nurse Practitioner Students, Guest Lecturer
10/2023-Present	Morning Report: Serving as an Expert Witness, Michigan Medicine: Pediatrics Residency Program
10/2023-Present	Care for Transgender Children and Adolescents, University of Michigan School of

Nursing, Guest Lecturer

Memberships in Professional Societies

2012 - Present Pediatric Endocrine Society

Committee/Service

National

2014 - 2016 Pediatric Endocrine Society - Ethics Committee, Other, Member

2017 - present Pediatric Endocrine Society - Special Interest Group on Gender Identity, Other, Member

2018 - 2022 Pediatric Endocrine Society - Program Directors Education Committee, Other, Member

Regional

2013 - 2015 Investigational Review Board - The Fenway Institute, Boston, MA, Other, Voting Member

Institutional

2017 - 2019 Department of Pediatrics at Michigan Medicine; Diversity, Equity, and Inclusion Committee, Other, Fellowship Lead

2017 - 2019 University of Michigan Transgender Research Group, Other, Director

Volunteer Service

Volunteer

2014 Camp Physician, Massachusetts, Served at a camp for youth with Type 1 Diabetes

Scholarly Activities

Presentations

Extramural Invited Presentation

Speaker

1. Grand Rounds, **Shumer D**, Loyola University School of Medicine, 07/2022, Chicago, Illinois

Other

1. Gender Identity, Groton School, 04/2015, Groton, MA
2. Television Appearance: Gender Identity in Youth, Channel 7 WXYZ Detroit, 04/2016, Southfield, MI
3. It Gets Better: Promoting Safe and Supportive Healthcare Environments for Sexual Minority and Gender Non-Conforming Youth, Adolescent Health Initiative: Conference on Adolescent Health, 05/2016, Ypsilanti, MI
4. Gender Identity, Humanists of Southeast Michigan, 09/2016, Farmington Hills, MI
5. Gender Identity, Pine Rest Christian Mental Health Services, 10/2016, Grand Rapids, MI
6. Pediatric Grand Rounds - Hormonal Management of Transgender Youth, Beaumont Children's Hospital, 11/2016, Royal Oak, MI
7. Transgender Youth: A Field in Transition, Temple Beth Emeth, 11/2016, Ann Arbor, MI
8. Transgender Youth: A Field in Transition, Washtenaw County Medical Society, 11/2016, Ann Arbor, MI
9. Pediatric Grand Rounds: Transgender Youth - A Field in Transition, St. John Hospital, 02/2017, Detroit, MI
10. Transgender Medicine, Veterans Administration - Ann Arbor Healthcare System, 05/2017, Ann Arbor, MI

11. Gender Identity, Hegira Programs, 05/2017, Detroit, MI

12. Care of the Transgender Adolescent, Partners in Pediatric Care, 06/2017, Traverse City, MI

13. Conference planner, host, and presenter: Transgender and Gender Non-Conforming Youth: Best Practices for Mental Health Clinicians, Educators, & School Staff; 200+ attendees from fields of mental health and education from across Michigan, Michigan Medicine, 10/2017, Ypsilanti, MI

14. Endocrinology Grand Rounds: Transgender Medicine, Wayne State University, 11/2017, Detroit, MI

15. Care of the Transgender Adolescent, St. John Hospital Conference: Transgender Patients: Providing Compassionate, Affirmative and Evidence Based Care, 11/2017, Grosse Pointe Farms, MI

16. Hormonal Care in Transgender Adolescents, Michigan State University School of Osteopathic Medicine, 11/2017, East Lansing, MI

17. Working with Transgender and Gender Non-Conforming Youth, Michigan Association of Osteopathic Family Physicians, 01/2018, Bellaire, MI

18. Community Conversations, Lake Orion, 01/2018, Lake Orion, MI

19. "I Am Jazz" Reading and Discussion, St. James Episcopal Church, 03/2019, Dexter, MI

20. Gender Identity, Michigan Organization on Adolescent Sexual Health, 10/2019, Brighton, MI; Port Huron, MI

21. Ask The Expert, Stand With Trans, 05/2020, Farmington Hills, MI (Virtual due to COVID)

22. Lets Talk About Hormones, Stand With Trans, 10/2020, Farmington Hills, MI (Virtual due to COVID)

23. Transgender Medicine, Michigan Association of Clinical Endocrinologists Annual Symposium, 10/2020, Grand Rapids, MI (Virtual due to COVID)

24. Transgender Youth in Primary Care, Michigan Child Care Collaborative (MC3), 10/2020, Ann Arbor, MI (Virtual due to COVID)

25. Gender Identity, Universalist Unitarian Church of East Liberty, 04/2021, Virtual due to COVID

26. Unconscious Bias, Ascension St. John Hospital, 05/2021, Virtual due to COVID

Publications/Scholarship

(Co-First Author *; Corresponding author **; Co-Last author ***)

Peer-Reviewed

Journal Article

1. **Shumer DE**, Mehringer JE, Braverman LE, Dauber A: Acquired hypothyroidism in an infant related to excessive maternal iodine intake: food for thought. *Endocr Pract.*19(4): 729-731, 01/2013. PM23512394

2. **Shumer DE**, Spack NP: Current management of gender identity disorder in childhood and adolescence: guidelines, barriers and areas of controversy. *Curr Opin Endocrinol Diabetes Obes.*20(1): 69-73, 02/2013. PM23221495

3. **Shumer DE**, Thaker V, Taylor GA, Wassner AJ: Severe hypercalcaemia due to subcutaneous fat necrosis: presentation, management and complications. *Arch Dis Child Fetal Neonatal Ed.*99(5): F419-F421, 09/2014. PM24907163

4. Tishelman AC, Kaufman R, Edwards-Leeper L, Mandel FH, **Shumer DE**, Spack NP: Serving Transgender Youth: Challenges, Dilemmas and Clinical Examples. *Prof Psychol Res Pr.*46(1): 37-45, 01/2015. PM26807001

5. **Shumer DE**, Tishelman AC: The Role of Assent in the Treatment of Transgender Adolescents. *Int J Transgend.*16(2): 97-102, 01/2015. PM27175107

6. **Shumer DE**, Roberts AL, Reisner SL, Lyall K, Austin SB: Brief Report: Autistic Traits in Mothers and Children Associated with Child's Gender Nonconformity. *J Autism Dev Disord.*45(5): 1489-1494, 05/2015. PM25358249

7. Tishelman AC, Kaufman R, Edwards-Leeper L, Mandel FH, **Shumer DE**, Spack NP: Reply to comment on "Serving Transgender Youth: Challenges, Dilemmas, and Clinical Examples" by Tishelman et al. (2015).

*Prof Psychol Res Pr.*46(4): 307, 08/2015. PM26858509

8. Guss C, **Shumer D**, Katz-Wise SL: Transgender and gender nonconforming adolescent care: psychosocial and medical considerations. *Curr Opin Pediatr.*27(4): 421-426, 08/2015. PM26087416

9. **Shumer DE**, Nokoff NJ, Spack NP: Advances in the Care of Transgender Children and Adolescents. *Adv Pediatr.*63(1): 79-102, 08/2016. PM27426896

10. **Shumer DE**, Reisner SL, Edwards-Leeper L, Tishelman A: Evaluation of Asperger Syndrome in Youth Presenting to a Gender Dysphoria Clinic. *LGBT Health.*3(5): 387-390, 10/2016. PM26651183

11. **Shumer DE**, Harris LH, Opipari VP: The Effect of Lesbian, Gay, Bisexual, and Transgender-Related Legislation on Children. *J Pediatr.*178: 5-6.e1, 11/2016. PM27575000

12. **Shumer DE**, Abrha A, Feldman HA, Carswell J: Overrepresentation of Adopted Adolescents at a Hospital-Based Gender Dysphoria Clinic. *Transgend Health.*2(1): 76-79, 01/2017. PM28861549

13. Edwards-Leeper L, **Shumer DE**, Feldman HA, Lash BR, Tishelman AC: Psychological profile of the first sample of transgender youth presenting for medical intervention in a U.S. pediatric gender center. *Psychology of Sexual Orientation and Gender Diversity.*4(3): 374-382, 01/2017

14. Tishelman AC, **Shumer DE**, Nahata L: Disorders of Sex Development: Pediatric Psychology and the Genital Exam. *J Pediatr Psychol.*42(5): 530-543, 06/2017. PM27098964

15. Strang JF, Meagher H, Kenworthy L, de Vries AL C, Menvielle E, Leibowitz S, Janssen A, Cohen-Kettenis P, **Shumer DE**, Edwards-Leeper L, Pleak RR, Spack N, Karasic DH, Schreier H, Balleur A, Tishelman A, Ehrensaft D, Rodnan L, Kuschner ES, Mandel F, Caretto A, Lewis HC, Anthony LG: Initial Clinical Guidelines for Co-Occurring Autism Spectrum Disorder and Gender Dysphoria or Incongruence in Adolescents. *J Clin Child Adolesc Psychol.*47(1): 105-115, 01/2018. PM27775428

16. Mohnach L, Mazzola S, **Shumer D**, Berman DR: Prenatal diagnosis of 17-hydroxylase/17,20-lyase deficiency (17OHD) in a case of 46,XY sex discordance and low maternal serum estriol. *Case Reports in Perinatal Medicine.*8(1)01/2018

17. Kim C, Harrall KK, Glueck DH, **Shumer D**, Dabelea D: Childhood adiposity and adolescent sex steroids in the EPOCH (Exploring Perinatal Outcomes among Children) study. *Clin Endocrinol (Oxf).*91(4): 525-533, 01/2019. PM31278867

18. Selkie E, Adkins V, Masters E, Bajpai A, **Shumer D**: Transgender Adolescents' Uses of Social Media for Social Support. *J Adolesc Health.*66(3): 275-280, 03/2020. PM31690534

19. Araya AC, Warwick R, **Shumer D**, Selkie E: Romantic Relationships in Transgender Adolescents: A Qualitative Study. *Pediatrics.*147(2)02/2021. PM33468600

20. Vengalil N, **Shumer D**, Wang F: Developing an LGBT curriculum and evaluating its impact on dermatology residents. *Int J Dermatol.*61: 99-102, 01/2022. PM34416015

21. Warwick RM, Araya AC, **Shumer DE**, Selkie EM: Transgender Youths' Sexual Health and Education: A Qualitative Analysis. *J Pediatr Adolesc Gynecol.*35(2): 138-146, 04/2022. PM34619356

22. Warwick RM, **Shumer DE**: Gender-affirming multidisciplinary care for transgender and non-binary children and adolescents. *Children's Health Care.*52(1): 91-115, 01/2023

23. Diaz-Thomas AM, Golden SH, Dabelea DM, Grimberg A, Magge SN, Safer JD, **Shumer DE**, Stanford FC: Endocrine Health and Health Care Disparities in the Pediatric and Sexual and Gender Minority Populations: An Endocrine Society Scientific Statement. *J Clin Endocrinol Metab.*108(7): 1533-1584, 06/2023. PM37191578

24. Waselewski AC, Klumpner TT, Kountanis JA, Sandberg ES, **Shumer DE**: Dexamethasone for postoperative nausea and vomiting prophylaxis in cesarean delivery and a delayed diagnosis of neonatal congenital adrenal hyperplasia. *International Journal of Obstetric Anesthesia.*Available on line12/2023. PM38195332

25. Roszell K, Shumer D, Orringer J, Wang F: Limited health insurance coverage of injectable neurotoxins and fillers for gender affirmation: a cross-sectional study of Affordable Care Act silver and Medicaid plans. *Int J Womens Dermatol.*10(1): e126, 03/2024. PM38313363

26. Blaszczak J, Wiener S, Plegue M, **Shumer D**, Shatzer J, Hernandez A: Evaluating the effectiveness of an online curriculum on caring for transgender and nonbinary patients. *Med Educ Online.*29(1): 2311481, 12/2024. PM38320110

Books

1. Clara A-V, Bizic M, Bockting WO, Bouman M-B, Bowers ML, Buncamper ME, Capitán L, Castillo M, Chim HW, Colebunders B, Crane C, D'Arpa S, Djordjevic ML, Estes C, Fein LA, Gasgarth R, Hoebeke P, Horne M, Joumblat NR, Kojic S, Levine JP, Lumen N, Meijerink WJ H J, Monstrey SJ, Salgado CJ, **Shumer DE**, Simon D, Sinha VR, Sinha VK, Spack NP, Sputova K, Stanojevic D, Stojanovic B, Tarsha AA, Thomas JP, van der Sluis WB, Volker MK, Weiss RE, Yamaguchi Y, Zhao LC, Zoghbi Y. *Gender Affirmation Medical & Surgical Perspectives*. Thieme, (2017)

Chapters

1. **Shumer D**: Coma. In Schwartz MW *The 5-Minute Pediatric Consult*,6, Lippincott Williams & Wilkins, Philadelphia, PA, (2012)

2. **Shumer D**, Spack N: Medical Treatment of the Adolescent Transgender Patient. In Đorđević M, Monstrey SJ, Salgado CJ Eds. *Gender Affirmation: Medical and Surgical Perspectives*,CRC Press/Taylor & Francis, (2016)

3. **Shumer DE**, Kinnear HA: Duration of Pubertal Suppression and Initiation of Gender-Affirming Hormone Treatment in Youth. In Finlayson *Pubertal Suppression in Transgender Youth*,Elsevier, (2018)

4. **Shumer DE**, Araya A: Endocrinology of Transgender Care – Children and Adolescents. In Poretsky, Hembree Ed. *Transgender Medicine: A Multidisciplinary Approach*,Springer, (2019)

Non-Peer Reviewed

Commentary

1. Martin S, Sandberg ES, **Shumer DE**: Criminalization of Gender-Affirming Care - Interfering with Essential Treatment for Transgender Children and Adolescents. *New England Journal of Medicine*.385(7): 579-581, 05/2021. PM34010528

Comparative Study

1. Reisner SL, Vetters R, Leclerc M, Zaslow S, Wolfrum S, **Shumer D**, Mimiaga MJ: Mental health of transgender youth in care at an adolescent urban community health center: a matched retrospective cohort study. *J Adolesc Health*.56(3): 274-279, 03/2015. PM25577670

Editorial

1. **Shumer D**, Roberts SA: Placing a Report of Bicalutamide-Induced Hepatotoxicity in the Context of Current Standards of Care for Transgender Adolescents. *J Adolesc Health*.74(1): 5-6, 01/2024. PM38103922

Editorial comment

1. **Shumer DE**: Health Disparities Facing Transgender and Gender Nonconforming Youth Are Not Inevitable, 01/2018. PM29437859

2. Martin S, Sandberg ES, **Shumer DE**: Criminalization of Gender-Affirming Care - Interfering with Essential Treatment for Transgender Children and Adolescents, 01/2021

Erratum

1. Tishelman AC, Kaufman R, Edwards-Leeper L, Mandel FH, **Shumer DE**, Spack NP: Correction to Serving Transgender Youth: Challenges, Dilemmas, and Clinical Examples, [Professional Psychology: Research and Practice, 46(1), (2015) 37-45]. *Professional Psychology: Research and Practice*.46(4): 249, 08/2015

Letter

1. Strang JF, Janssen A, Tishelman A, Leibowitz SF, Kenworthy L, McGuire JK, Edwards-Leeper L, Mazefsky CA, Rofey D, Bascom J, Caplan R, Gomez-Lobo V, Berg D, Zaks Z, Wallace GL, Wimms H, Pine-Twaddell E, **Shumer D**, Register-Brown K, Sadikova E, Anthony LG: Revisiting the Link: Evidence of the Rates of Autism in Studies of Gender Diverse Individuals. *J Am Acad Child Adolesc Psychiatry*.57(11): 885-887, 11/2018. PM30392631

Letter to editor

1. **Shumer D**: Doctor as environmental steward, 01/2009. PM19364173

News

1. **Shumer DE**, Spack NP: Paediatrics: Transgender medicine--long-term outcomes from 'the Dutch model'. *Nat Rev Urol*.12(1): 12-13, 01/2015. PM25403246

Other

1. **Shumer D**: The Effect of Race and Gender Labels in the Induction of Traits. *Northwestern Journal of Race and Gender Criticism*.NA01/2014
2. **Shumer D**: A Tribute to Medical Stereotypes. *The Pharos, Journal of the Alpha Omega Alpha Medical Society*.Summer07/2017
3. Mohnach L, Mazzola S, **Shumer D**, Berman DR: Prenatal Diagnosis of 17-hydroxylase/17,20-lyase deficiency (17OHD) in a case of 46,XY sex discordance and low maternal serum estriol. *Case Reports in Perinatal Medicine*.8(1)12/2018
4. Araya A, **Shumer D**, Warwick R, Selkie E: 37. "I've Been Happily Dating For 5 Years" - Romantic and Sexual Health, Experience and Expectations in Transgender Youth. *Journal of Adolescent Health*.66(2): s20, 02/2020
5. Araya A, **Shumer D**, Warwick R, Selkie E: 73. "I think sex is different for everybody" - Sexual Experiences and Expectations in Transgender Youth. *Journal of Pediatric and Adolescent Gynecology*.33(2): 209-210, 04/2020
6. Araya AC, Warwick R, **Shumer D**, Selkie E, Rath T, Ibrahim M, Srinivasan A: Romantic Health in Transgender Adolescents. *Pediatrics*.Pediatrics01/2021

Podcast

1. Gaggino L, Shumer WG D: Pediatric Meltdown: Caring for Transgender Youth with Compassion: What Pediatricians Must Know, 01/2020

Abstract/Posters

1. **Shumer D**: Overrepresentation of Adopted Children in a Hospital Based Gender Program, World Professional Association of Transgender Health Biennial International Symposium, Amsterdam, The Netherlands, 2016
2. **Shumer D**: Mental Health Presentation of Transgender Youth Seeking Medical Intervention, World Professional Association of Transgender Health Biennial International Symposium, Amsterdam, The Netherlands, 2016
3. **Shumer D**, Kinnear H, McLain K, Morgan H: Development of a Transgender Medicine Elective for 4th Year Medical Students, National Transgender Health Summitt, Oakland, CA, 2017
4. Adkins V, Masters E, **Shumer D**, Selkie E: Exploring Transgender Adolescents' Use of Social Media for Support and Health Information Seeking (Poster Presentation), Pediatric Research Symposium, Ann Arbor, MI, 2017
5. Sandberg E, Baines HK, Aye T, Hart-Unger S, Lopez X, Nikita ME, Nokoff NJ, Persky R, **Shumer D**, Harris RM, Roberts SA: National Assessment for the Need of a Comprehensive Pediatric Gender Affirming Care Curriculum, Poster, Pediatric Endocrine Society Meeting, Virtual, 2021

EXHIBIT 3

EXHIBIT 3

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

REV. PAUL A. EKNES-TUCKER; BRIANNA BOE, individually and on behalf of her minor son, MICHAEL BOE; JAMES ZOE, individually and on behalf of his minor son, ZACHARY ZOE; MEGAN POE, individually and on behalf of her minor daughter, ALLISON POE; KATHY NOE, individually and on behalf of her minor son, CHRISTOPHER NOE; JANE MOE, Ph.D.; and RACHEL KOE, M.D.

Plaintiffs,

v.

KAY IVEY, in her official capacity as Governor of the State of Alabama; STEVE MARSHALL, in his official capacity as Attorney General of the State of Alabama; DARYL D. BAILEY, in his official capacity as District Attorney for Montgomery County; C. WILSON BAYLOCK, in his official capacity as District Attorney for Cullman County; JESSICA VENTIERE, in her official capacity as District Attorney for Lee County; TOM ANDERSON, in his official capacity as District Attorney for the 12th Judicial Circuit; and DANNY CARR, in his official capacity as District Attorney for Jefferson County.

Defendants.

Civil Action No.
2:22-cv-184-LCB

DECLARATION OF STEPHEN ROSENTHAL, MD, IN SUPPORT OF PLAINTIFFS' MOTION FOR TEMPORARY RESTRAINING ORDER & PRELIMINARY INJUNCTION

I, Stephen M. Rosenthal, M.D., declare as follows:

1. I submit this expert declaration based upon my personal knowledge.

2. If called to testify in this matter, I would testify truthfully based on my expert opinion.

Qualifications and Experience

3. I am a pediatric endocrinologist and have been practicing medicine for over forty years. I received my medical degree from Columbia University, College of Physicians & Surgeons, in 1976, and completed a residency in Pediatrics there. I also completed a fellowship in Pediatric Endocrinology at the University of California, San Francisco ("UCSF").

4. In 2012, I co-founded the Child & Adolescent Gender Center ("CAGC") at UCSF. I am the Medical Director at the Center, as well as a Professor of Clinical Pediatrics at UCSF. A true and correct copy of my Curriculum Vitae is attached hereto as **Exhibit A**.

5. The Child and Adolescent Gender Center (CAGC) is a multidisciplinary program that provides comprehensive medical and mental health care, as well as education and advocacy services for transgender youth and adolescents. Since 2012, the CAGC has seen close to 2,000 transgender young people with gender dysphoria, with an average of 15-20 new patients per month, ranging in age from 3 to 25 years old. As Medical Director of the CAGC, I oversee

the medical portion of the multidisciplinary program, which currently includes two other physicians, a doctor of nursing practice, one psychologist, a clinical social worker, nursing, and administrative staff.

6. As of the date of this declaration, I have published 27 scientific research papers in leading peer-reviewed medical journals and authored seven chapters in authoritative textbooks on the topic of medical treatment for gender dysphoria in children and adolescents. Those publications include "Challenges in the Care of Transgender and Gender-Diverse Youth: An Endocrinologist's View," published in Nature Reviews Endocrinology[1] on August 10, 2021, "Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline," a guide detailing the standard of medical care for gender dysphoria, and a chapter in the forthcoming standards of care being developed by WPATH. A listing of my publications is included in my Curriculum Vitae in **Exhibit A**.

7. I am also actively serving as a Principal Investigator or Co-Investigator on numerous research projects on the physical and mental health of transgender young people, including a national multi-site study on medical care for transgender young people funded by the NIH.

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[1] Nature Reviews Endocrinology received an impact factor of 43.33 for the 2021-2022 publication year.

8. I am a member and recent past president (2016-2017) of the Pediatric Endocrine Society and, as of March, 2021, have just completed a three-year term as a member of the Board of Directors for the Endocrine Society, and one-year term as Endocrine Society Vice President, Clinical Scientist Position. I am also an elected member of the Board of Directors of the World Professional Association for Transgender Health ("WPATH"), an international multidisciplinary professional association founded in 1979 to promote evidence-based care, education, research, advocacy, public policy and respect in transgender health. A complete list of my professional associations is included in my Curriculum Vitae in **Exhibit A**.

9. In addition to my work with transgender children and adolescents, I have treated children and adolescents with differences of sex development ("DSD"), commonly referred to as intersex conditions, as well as with a variety of other endocrine conditions, including growth disorders, pubertal disorders, and diabetes. I previously served as Program Director for Pediatric Endocrinology, Director of the Endocrine Clinics, and Co-Director of the Disorders of Sex Development Clinic, a multi-disciplinary program involving pediatric endocrinology, pediatric urology, psychiatry, and social work at UCSF Benioff Children's Hospital.

10. My opinions contained in this declaration are based on: (i) my clinical experience as a pediatric endocrinologist treating transgender patients, including adolescents and young adults; (ii) my knowledge of the peer-reviewed research,

including my own, regarding the treatment of gender dysphoria, which reflects the clinical advancements in the field of transgender health; and (iii) my review of the expert declaration of Linda A. Hawkins, Ph.D., M.S.Ed., LPC ("Dr. Hawkins Decl.") submitted in support of the motions. I generally rely on these types of materials when I provide expert testimony, and they include the documents specifically cited as supportive examples in particular sections of this declaration. The materials I have relied on in preparing this declaration are the same type of materials that experts in my field of study regularly rely upon when forming opinions on the subject.

11. I was provided with and reviewed the following case-specific materials: the Dr. Hawkins Decl.

12. In the past four years, I have not provided expert testimony.

13. I am being compensated at an hourly rate for the actual time that I devote to this case, at the rate of $350 per hour for any review of records, preparation of reports or declarations. I will be compensated with a day rate (6 hours) of $2,100 for deposition and trial testimony. My compensation does not depend on the outcome of this litigation, the opinions that I express, or the testimony that I provide.

Scientific and Medical Understanding of Sex

14. By the beginning of the twentieth century, scientific research had established that external genitalia alone are not always an accurate indicator of a person's sex. Instead, a person's sex is comprised of several components, including,

among others, internal reproductive organs, external genitalia, chromosomes, hormones, gender identity, and secondary-sex characteristics. Diversity and incongruence in these components of a person's sex are a naturally occurring source of human biological diversity.

15. Scientific research and medical literature across disciplines demonstrate each component of sex has strong biological ties, including gender identity. For example, there are numerous studies detailing similarities in the brain structure and function of transgender and nontransgender people with the same gender identity. In one such study, the volume of the bed nucleus of the stria terminalis (a collection of cells in the central brain) in transgender women was equivalent to the volume found in nontransgender women. There are also studies highlighting the genetic components of gender identity. A study of identical twins found that if one twin was transgender that the other twin was far more likely to be transgender, as compared to the general population.

16. The above studies are representative examples of the growing body of scientific research and medical literature in this area of study. There is also ongoing research on the effects of the hormonal milieu in utero, and genetic sources for gender identity, among others.

17. Although the specific determinants of gender identity remain unknown, treatment to bring a person's physical characteristics into alignment with their

gender identity is widely accepted as the standard in medical practice.

Determination of an Individual's Sex

18. At birth, newborns are assigned a sex, either male or female, typically based solely on the appearance of their external genitalia. For most people, that assignment turns out to be accurate and their assigned sex matches that person's gender identity. However, for transgender people, their assigned sex does not align with their gender identity. This lack of alignment can create significant distress for transgender individuals.

19. When there is a divergence between these factors, medical science and the well-established standards of care recognize that treating a person consistent with their gender identity—and prescribing medical treatment to align their body with their gender identity—is essential to that person's health and wellbeing.

20. Gender identity is a person's inner sense of belonging to a particular gender, such as male or female. It is a deeply felt and core component of human identity. Everyone has a gender identity. Children usually become aware of their gender identity early in life.

21. A person's gender identity is innate, cannot be voluntarily changed, and is not undermined by the existence of other sex-related characteristics that do not align with it.

22. Any attempts to "cure" transgender individuals by forcing their gender

identity into alignment with their assigned sex are harmful, dangerous, and ineffective. Those practices have been denounced as unethical by all major professional associations of medical and mental health professionals, such as WPATH, the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association.

23. For more than four decades, the goal of medical treatment for transgender patients has been to alleviate their distress by bringing their lives into closer alignment with their gender identity. The specific treatments prescribed are based on individualized assessment conducted by medical providers in consultation with the patient's treating mental health provider. As discussed in more detail in the following section, and in the declaration of Dr. Hawkins, research and clinical experience have consistently shown those treatments to be safe, effective, and critical to the health and well-being of transgender patients.

Standards of Care for the Treatment of Gender Dysphoria

24. Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of "gender dysphoria," a serious condition listed in both the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ("DSM-5") and the World Health Organization's International Classification of Diseases ("ICD-10"), and has been

recognized as such for decades. It is a condition that affects a small percentage of youth and adults.

25. Gender dysphoria is the diagnostic term for the clinically significant distress resulting from the incongruence between a person's gender identity and the sex they are assigned at birth. In order to be diagnosed with gender dysphoria, the incongruence must have persisted for at least six months and be accompanied by clinically significant distress or impairment.

26. Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression, self-harm, and suicidality. Spack NP, Edwards-Leeper L, Feldmain HA, et al. Children and adolescents with gender identity disorder referred to a pediatric medical center. *Pediatrics*. 2012; 129(3):418-425. Olson KR, Durwood L, DeMeules M, McLaughlin KA. Mental health of transgender children who are supported in their identities. *Pediatrics*. 2016; 137:1-8.

27. The prevailing standards of care for the treatment of gender dysphoria are developed by WPATH, which has been recognized as the standard-setting organization for the treatment of gender dysphoria for more than forty years.

28. The Endocrine Society is a 100-year-old global membership organization representing professionals in the field of adult and pediatric endocrinology. In 2017, the Endocrine Society published its second clinical practice

guidelines on treatment recommendations for the medical management of gender dysphoria, in collaboration with Pediatric Endocrine Society, the European Societies for Endocrinology and Pediatric Endocrinology, and WPATH, among others. Hembree WC, Rosenthal SM, et al. Endocrine Treatment of Gender Dysphoria/Gender Incongruent Persons: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* 2017; 102: 3869–3903.

29. Together, the SOC and the Endocrine Society's clinical practice guidelines constitute the prevailing standards guiding the healthcare and treatment of gender dysphoria. The process for writing those standard-setting documents followed well-established methods for developing standards of care, beginning with the convening a core group of experts in the relevant field(s) who are tasked with conducting a comprehensive literature review and preparing a draft document. That draft is then circulated to a larger cross-section of practitioners in the relevant field(s) for review and comment, much like the peer-review process for journals. Those edits and comments are incorporated and compiled into a final document that is reviewed and ratified in a manner consistent with the organization's bylaws. As a result, the SOC and the Endocrine Society's clinical practice guidelines reflect the consensus of experts in the field of transgender medicine, based on the best available science and clinical experience.

30. The major professional associations of medical and mental health providers in the United States, including the American Medical Association, American Academy of Pediatrics, American Psychiatric Association, American Psychological Association, and Pediatric Endocrine Society, treat those documents as the prevailing standards guiding the healthcare and treatment of gender dysphoria.

31. Those documents help ensure that healthcare providers, especially those unfamiliar with transgender medicine, know which treatments are safe and effective for the treatment of gender dysphoria, and are able to deliver that necessary medical care to maximize their patients' overall health and wellbeing.

Transition and Medical Treatments for Gender Dysphoria

32. Undergoing treatment to alleviate gender dysphoria is commonly referred to as a transition. The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical transition, including puberty-delaying medication and hormone-replacement therapy; and (iii) surgical transition, including surgeries to alter the appearance and functioning of primary- and secondary-sex characteristics.

33. The steps that make up a person's transition will depend on that individual's medical and mental health needs, as well as the person's stage of pubertal development.

34. Dr. Hawkins provides an extensive discussion of social transition in her expert declaration. (Dr. Hawkins Decl. at ¶¶ 26–31.) My declaration will discuss the medications and surgical care used to treat gender dysphoria.

35. There are no drug interventions for gender dysphoria until after the onset of puberty. Medical providers evaluate a patient's level of pubertal development through a physical examination and testing the hormone levels in the patient's blood. Once a provider has determined that a transgender patient has begun puberty, the patient may be prescribed puberty-blocking medications.

36. Those medications work by temporarily pausing endogenous puberty and, therefore, limiting the influence of a person's endogenous sex hormones on their body. For example, a transgender girl (someone designated male at birth with a female gender identity) will experience no progression of physical changes caused by testosterone, including facial and body hair, an Adam's apple, a deepened voice, or masculinized facial structures. And in a transgender boy (someone designated female at birth with a male gender identity), those medications would prevent progression of breast development, menstruation, and widening of the hips. This prevents a transgender adolescent from experiencing the severe psychological distress of developing permanent, unwanted physical characteristics that do not align with the adolescent's gender identity.

37. Temporarily halting a transgender adolescent's pubertal development can also obviate the need for future surgical treatments to address any ongoing gender dysphoria. Avoiding the scarring associated with surgery—and the added stresses of surgery itself—further improve a transgender person's overall health and wellbeing.

38. A transgender adolescent will remain on those puberty-blocking medications until their providers determine, in consultation with the patient, the patient's family, and consistent with the prevailing standards of care, whether additional medical treatment is necessary to treat their gender dysphoria. If the decision is to stop taking puberty blockers, the patient's endogenous puberty will resume.

39. For many transgender youth, it is medically necessary for them to begin hormone-replacement therapy with either testosterone or estrogen. That treatment induces the physical changes of the puberty associated with the patient's gender identity. The result of this treatment is that a transgender boy has the same typical levels of circulating testosterone as his nontransgender male peers. Similarly, a transgender girl will have the same typical levels of circulating estrogen as her nontransgender female peers. Those hormones cause transgender adolescents to undergo the same significant and permanent sex-specific physical changes as their nontransgender peers. For example, a transgender boy will develop a lower voice as

well as facial and body hair, while a transgender girl will experience breast growth, female fat distribution, and softer skin.

40. If a transgender youth who is on puberty blockers and hormone-replacement therapy ceases these medications, the production of endogenous hormones and puberty consistent with the individual's birth sex will resume.

41. Puberty-delaying medication and hormone-replacement therapy—both individually and in combination—also significantly improve a transgender young person's mental health because those medications ensure their physical appearance more closely aligns with their gender identity. This also decreases the likelihood that a transgender young person will be incorrectly identified with their birth sex, further alleviating their gender dysphoria and bolstering the effectiveness of their social transition.

42. The puberty-delaying medications that are used for treating transgender children are the same medications that have been used for decades and are continued to be used to treat a condition in children often referred to as "precocious puberty," a condition that causes a child's body to begin pubertal development too early. In other words, the hormone therapy used to treat transgender adolescents is often used to treat non-transgender adolescents for other medical reasons.

43. Social transition and hormone therapy are often sufficient to treat gender dysphoria for many transgender people.

44. Based on my clinical experience, there are transgender young people for whom getting on puberty blockers and hormones before the age of majority will reduce the likelihood of their needing surgical intervention later in life relating to gender dysphoria.

45. Further, recent studies have observed findings that gender-affirming hormone therapy usage is significantly related to lower rates of depression and suicidality among transgender youth. Green AE et al. Association of Gender-Affirming Hormone Therapy With Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth. *J Adolescent Health* 1-7 (2021); Turban JL et al. Access to gender-affirming hormones during adolescence and mental health outcomes among transgender adults. PLoS ONE 17(1) 2021; https://doi.org/10.1371/journal. pone.0261039.

46. For transgender people who require surgery to treat their gender dysphoria, the SOC do not recommend surgical treatment until the age of majority, except for male chest reconstruction surgery. Like any other treatment, the medical necessity of surgical procedures to treat gender dysphoria is based on an individualized assessment of the patient's needs.

Assessing Medical Necessity of Medical Treatment for Gender Dysphoria

47. As with the initial diagnosis of gender dysphoria, determining whether a particular treatment is medically necessary for a transgender patient follows a

thorough, well-established process that requires healthcare providers to exercise professional judgment. Contrary to what some believe, prescriptions for puberty-blocking medication and hormone-replacement or referrals for surgery are not made on a whim. Every step of a transgender patient's treatment and care is planned out in consultation with the patient's care team, which includes both medical and mental health providers.

48. Prior to considering starting a course of puberty-blockers or hormone-replacement therapy, a transgender patient undergoes an extensive assessment by a mental health provider. The purpose of that assessment is three-fold: (1) obtaining a complete picture of the patient's mental health, including whether the patient has gender dysphoria; (2) determine the patient's psychological readiness to begin the contemplated treatment; and (3) provide the patient and their family the information they need to make an informed decision about whether to proceed with the treatment. If, after that assessment, the mental health provider determines that the patient should be considered for the contemplated treatment, that professional opinion is documented in a letter to the patient's medical provider.

49. The medical provider then conducts their own separate assessment of the patient, including a physical examination and any necessary laboratory testing. In addition to determining the medical necessity of the contemplated treatment and a patient's medical readiness for that treatment, the medical provider will also

discuss the risks, benefits, and alternatives for the contemplated treatment. Medical providers also discuss with parents that the medications are being prescribed for an off-label use, which is particularly common for medications being used in pediatric patients. That discussion occurs with the patient and their family to ensure that everyone involved in the decision-making process has the information they need to make an informed decision.

50. Once the medical provider has finished addressing any questions or concerns raised by the patient and family, the parents/legal guardians and the patient are provided with a detailed informed consent/assent form that outlines in writing the information the medical provider reviewed with them. The patient and family are encouraged to carefully review that paperwork and sign if they choose to consent/assent to treatment.

51. It is only at the end of that intensive assessment and informed-consent process that a patient is prescribed a particular medical treatment for gender dysphoria.

Medical Treatment for Gender Dysphoria is Evidence-Based Medicine

52. Research and clinical experience repeatedly reaffirm that transition significantly improves the mental and physical health of transgender young people.

53. This is true of each stage of a transgender young person's transition. Transgender young people who underwent a social transition in childhood

demonstrated better mental health profiles than prior studies of gender nonconforming children. *See* Lily Durwood, et al., *Mental Health and Self-Worth in Socially Transitioned Transgender Youth*, 56 J. Am. Acad. of Child & Adol. Psychiatry 116 (2017); Kristina Olson, et al., *Mental Health of Transgender Children who are Supported in Their Identities*, 137 Pediatrics 1 (2016). This same outcome has also been seen in a longitudinal study of transgender young people who underwent each of the three stages of transition outlined above. Annelou L.C. de Vries, et al., *Young Adult Psychological Outcome After Puberty Suppression and Gender Reassignment*, 134 Pediatrics 696 (2014). In a study specifically about male chest reconstruction surgery, post-operative transgender young people demonstrated significant psychological and functional improvements, from a greater willingness to plan for their future and to engage activities of daily living (e.g., bathing, buying clothing). Johanna Olson-Kennedy, et al., *Chest Reconstruction and Chest Dysphoria in Transmasculine Minors and Young Adults Comparisons of Nonsurgical and Postsurgical Cohorts*, 172 JAMA Pediatrics 431, 434 (2018)

54. Transition also can—and often does—alleviate co-occurring mental health issues a transgender young person experienced prior to transition. Following transition, transgender young people typically see significant improvements in functioning and quality of life. Treating their gender dysphoria also increases a

transgender young person's capacity to develop and maintain better coping strategies to manage any co-occurring conditions.

55. Conversely, delaying or denying transgender young people safe and effective treatment for gender dysphoria—as contemplated by the wait-and-see approach—can have severe consequences on their physical and mental health. Without those medically necessary treatments, transgender young people are likely to develop serious co-occurring mental health conditions (*i.e.* anxiety, depression, suicidality) that will interfere with their ability to learn and impede their psychosocial development.

Conclusion

56. Alabama's law criminalizing the provision of medical treatment for gender dysphoria is contrary to well-established standards of care, peer-reviewed medical literature, and clinical experience. Medical care for transgender young people in Alabama would be guided by fear of criminal penalty, forcing medical providers to abandon their professional and ethical obligations to follow the prevailing standards of care when treating patients with gender dysphoria.

57. Contrary to its stated purpose, this bill will endanger the health and wellbeing of transgender young people experiencing gender dysphoria by creating significant barriers to their receiving medically necessary care. The lack of access to

that time-sensitive care will have lifelong implications for their quality of life and their ability to effectively treat their gender dysphoria.

This declaration was executed this 19th day of April, 2022.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

By: Stephen M. Rosenthal
Stephen M. Rosenthal, M.D.

EXHIBIT A

Prepared: May 26, 2020

University of California, San Francisco

CURRICULUM VITAE

Name: Stephen M Rosenthal, MD

Position: Recalled Faculty
Pediatrics
School of Medicine

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University of California, San Francisco
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Email: Stephen.Rosenthal@ucsf.edu

EDUCATION

1968 - 1972	Yale University	BA	Psychology
1972 - 1976	Columbia University, Colege of Physicians & Surgeons	MD	
1976 - 1977	Columbia University, Presbyterian Hospital	Intern	Pediatrics
1977 - 1979	Columbia University, Presbyterian Hospital	Resident	Pediatrics
1979 - 1982	University of California, San Francisco	Fellow	Pediatric Endocrinology

LICENSES, CERTIFICATION

1980	Medical License, California, #G42045
1982	American Board of Pediatrics
1983	American Board of Pediatric Endocrinology

PRINCIPAL POSITIONS HELD

1982 - 1983	University of California, San Francisco	Instructor	Pediatrics
1983 - 1992	University of California, San Francisco	Assistant Professor in Residence	Pediatrics
1992 - 1998	University of California, San Francisco	Associate Professor in Residence	Pediatrics

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1998 - 2012	University of California, San Francisco	Professor in Residence	Pediatrics
2012 - present	University of California, San Francisco	Professor of Clinical Pediatrics	Pediatrics

OTHER POSITIONS HELD CONCURRENTLY

2006 - 2015	University of California, San Francisco	Director, Pediatric Endocrine Outpatient Services	Pediatrics
2008 - 2011	University of California, San Francisco	Associate Program Director, Pediatric Endocrinology	Pediatrics
2008 - 2018	University of California, San Francisco	Pediatric Endocrine Director, Disorders of Sex Development (DSD) Clinic	Pediatrics
2011 - present	University of California, San Francisco	Medical Director, Child & Adolescent Gender Center	Pediatrics
2012 - 2015	University of California, San Francisco	Program Director, Pediatric Endocrinology	Pediatrics

HONORS AND AWARDS

2011	Nominated for the Chancellor's Award for Gay, Lesbian, Bisexual, and/or Transgender Leadership for a faculty member	University of California, San Francisco
2012	Nominated for the Chancellor's Award for Gay, Lesbian, Bisexual, and/or Transgender Leadership for a faculty member	University of California, San Francisco
2012	Family Advisory Council Caring Tree Award	UCSF Benioff Children's Hospital
2013	Chancellor's Award for Gay, Lesbian, Bisexual, and Transgender (GLBT) Leadership in the faculty category	University of California, San Francisco

2014	Haile T. Debas Academy of Medical Educators Excellence in Teaching Award	University of California, San Francisco
2018	Harry Benjamin Lectureship, World Professional Association for Transgender Health, for significant contributions to the field of transgender health through research, healthcare provision and medical education	World Professional Association for Transgender Health

KEYWORDS/AREAS OF INTEREST

Biology of gender, transgender, Disorders of Sex Development (DSD), Insulin-like Growth Factors (IGFs), neuroblastoma, water balance disorders, Type 1 Diabetes, medical education, fellowship training.

CLINICAL ACTIVITIES

CLINICAL ACTIVITIES SUMMARY

I currently serve as Medical Director, Child and Adolescent Gender Center, a UCSF/ Community partnership designed to provide multidisciplinary services for pediatric and adolescent gender nonconforming/ transgender patients. I have served as Pediatric Endocrine Director, Disorders of Sex Development (DSD) monthly clinic, a multi-disciplinary program involving Pediatric Endocrinology, Pediatric Urology, Psychiatry, and Social Work. I currently Attend in the out-Patient clinics: Currently, 2 clinics/ week.

PROFESSIONAL ACTIVITIES

MEMBERSHIPS

1983 - present	The Endocrine Society
1983 - present	The Pediatric Endocrine Society (formerly known as the Lawson Wilkins Pediatric Endocrine Society)
1983 - 2000	Western Society for Pediatric Research
1986 - present	The Society for Pediatric Research
2011 - present	World Professional Association for Transgender Health (WPATH)

SERVICE TO PROFESSIONAL ORGANIZATIONS

1990 - 1993	Pediatric Endocrine Society	Member, Organizing Committee for the Combined Lawson Wilkins Pediatric Endocrine Society and the European Endocrine Society IV International Meeting

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1999 - 1999	Society for Insulin-like Growth Factor Research	Member, Scientific Planning Committee, 5th International Symposium on Insulin-Like Growth Factors, Brighton, UK
2000 - 2005	Pediatric Endocrine Society	Member, Drug and Therapeutics Committee
2002 - 2005	The Endocrine Society	Member, Special Programs Committee
2003 - 2004	Pediatric Endocrine Society	Chair, Drug and Therapeutics Committee
2005 - 2008	The Endocrine Society	Member, Science and Educational Programs Core Committee
2006 - 2006	Eli Lilly Co.	Member, National Growth Hormone Clinical Physicians Advisory Panel
2007 - 2013	Pediatric Endocrine Society	Member, Ethics Committee
2007 - 2007	Pediatric Endocrine Society, Growth Hormone Research Society, and European Society of Pediatric Endocrinology	Member, Consensus Workshop Committee on Diagnosis and Management of Idiopathic Short Stature
2008 - present	The Endocrine Society	Abstract Reviewer/Grader
2008 - 2011	The Endocrine Society	Member, Annual Meeting Steering Committee
2009 - 2009	Pediatric Endocrine Society and European Society of Pediatric Endocrinology	Abstract Reviewer/Grader

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2009 - 2011	The Endocrine Society	Team Leader, Annual Meeting Steering Committee
2010 - 2013	Pediatric Endocrine Society	Elected to Board of Directors
2012 - 2012	The Endocrine Society	ENDO 2012 Presidential Poster Competition Judge
2012 - 2015	Pfizer, Inc.	Review Committee: ASPIRE Young Investigator Awards in Endocrine Research
2012 - 2015	The Endocrine Society	Member, Clinical Endocrine Education Committee
2012 - present	Pediatric Endocrine Society	Member, Honors Committee
2013 - 2017	Pediatric Endocrine Society	Member, Maintenance of Certification Committee
2014 - 2017	Endocrine Society and Pediatric Endocrine Society	Official representative of Pediatric Endocrine Society to Endocrine Society's Clinical Practice Guidelines Revision Task Force for the Care of Transgender Individuals
2015 - 2016	Pediatric Endocrine Society	President-elect
2016 - 2017	Pediatric Endocrine Society	President
2017 - 2018	Pediatric Endocrine Society	Immediate Past President
2017 - 2018	Pediatric Endocrine Society	Chair, Honors and Awards Committee
2018 - 2019	Endocrine Society	Vice President, Clinical Scientist Position

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2019 - present	Endocrine Society	Member, Board of Directors

SERVICE TO PROFESSIONAL PUBLICATIONS

1986 - present	Reviewer, Journal of Clinical Endocrinology and Metabolism
1987 - present	Reviewer, Endocrinology
1991 - 1993	Reviewer, DNA and Cell Biology
1991 - 2000	Reviewer, Life Sciences
1992 - present	Reviewer, Diabetes
1993 - 2008	Reviewer, Cancer Research
1994 - present	Reviewer, Molecular Endocrinology
1995 - present	Reviewer Journal of Cell Physiology
1996 - 2000	Reviewer, Journal of Cell Biology
1998 - 2008	Reviewer, Journal of Biological Chemistry
2006 - present	Reviewer, Journal of Pediatric Endocrinology and Metabolism
2010 - present	Reviewer, International Journal of Pediatric Endocrinology
2015 - 2018	Associate Editor, Transgender health
2015 - present	Editorial Board Member, International Journal of Transgenderism

INVITED PRESENTATIONS - INTERNATIONAL

1984	7th International Congress of Endocrinology, Quebec, Canada	Lecture
1985	Symposium "Therapeutic Agents Produced by Genetic Engineering: Quo Vadis? - The Example of Growth Hormone and Its Releasing Factor", Toulouse, France,	Invited lectures (2)
1985	28 emes Journees Internationales Henri-Pierre Klotz D'Endocrinologie Clinique, Paris, France	Invited lecture
1986	1st International Congress of Neuroendocrinology, San Francisco	Invited lecture
1988	GRF Symposium, Sanofi Group, Paris, France	Invited lecture
1990	Serono Symposium "Major Advances in Human Female Reproduction", Rome, Italy	Invited lecture and Session chair
1990	3rd International Symposium on Molecular and Cellular Biology of Insulin and IGFs, Gainesville, FL	Poster
1991	2nd International Symposium on Insulin-Like Growth Factors/Somatomedins, San Francisco,	Posters (2)

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1992	9th International Congress of Endocrinology, Nice, France	Poster
1993	4th International Symposium on Insulin, IGFs, and Their Receptors, Marine Biological Laboratory, Woods Hole, MA	Poster
1993	LWPES/ESPE Fourth Joint Meeting, San Francisco, CA	lecture, Poster, & Session chair
1994	The Third International Symposium on Insulin-Like Growth Factors, Sydney, Australia	Invited lecture
1994	AgResearch, Hamilton, New Zealand (lecture title: "Insulin-like Growth factors and Skeletal Muscle Differentiation")	Invited lecture and Visiting Professor
1994	Jacques Ducharme Annual Lectureship, University of Montreal, Canada	Invited lecture
1995	5th International Symposium on Insulin and IGFs, Gainesville, FL	Poster
1996	10th International Congress of Endocrinology, San Francisco, CA	Platform
1997	5th Joint Meeting of the European Society for Pediatric Endocrinology and the Lawson Wilkins Pediatric Endocrine Society, Stockholm, Sweden	Platform
1997	4th International Symposium on Insulin-like Growth Factors, Tokyo, Japan	Platform
1999	5th International Symposium on Insulin-like Growth Factors, Brighton, UK	Platform, Session chair, Member, Scientific Planning Committee
2000	Symposium Medicus Conference on Adolescent Medicine, Ixtapa, Mexico	Invited lectures (3)
2001	6th Joint Meeting of the European Society for Pediatric Endocrinology and the Lawson Wilkins Pediatric Endocrine Society, Montreal, Canada	Platform
2001	William Soler Children's Hospital, Havana, Cuba	Invited lecture and Visiting Professor
2002	First Joint Symposium GH-IGF 2002, Boston, MA	Platform
2002	2nd Cuban Symposium on Immunology of Diabetes, Havana, Cuba	Invited lecture

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2005	Canadian Society of Endocrinology and Metabolism and Canadian Diabetes Association Annual Meeting, Edmonton, Alberta, Canada, (Pediatric Symposium on: Activating Mutations: Genetic Basis and Therapeutic Implications)	Invited lecture
2006	38th International Symposium: GH and Growth Factors in Endocrinology and Metabolism, Granada Spain, ["Hot Topics" session: Lecture title: "Nephrogenic Syndrome of Inappropriate Antidiuresis (NSIAD): A Paradigm for Activating Mutations Causing Endocrine Dysfunction]	Invited lecture
2006	Sanofi-Aventis, Paris, France, (Lecture title: "Potential Use of Selective V2 Vasopressin Receptor Antagonists as Inverse Agonists in the Treatment of Nephrogenic Syndrome of Inappropriate Antidiuresis")	Invited lecture
2006	Primary Insulin-like Growth Factor-I Deficiency (IGFD) International Advisory Board Meeting, Tercica, Inc., San Francisco, CA,	Invited speaker
2007	1er Simposio Argentino Noditropin Simplex en Endocrinologia Pediatrica, Punta del Este, Uruguay, (Lecture titles: "Primary IGF-I Deficiency"; and "Activating Mutations of the V2 Vasopressin Receptor")	Invited Plenary Lectures (2)
2007	GeNeSIS Investigators Meeting, Paris, France, (Panel : "Growth Attenuation: Current Concepts and Controversies")	Invited Panel Member
2007	Idiopathic Short Stature (ISS) Consensus Conference/International Meeting, Santa Monica, CA	Invited participant and Session chair
2008	5th Biennial Scientific Meeting of the Asia Pacific Pediatric Endocrine Society, Seoul, Korea, [Lecture title: "Nephrogenic Syndrome of Inappropriate Antidiuresis (NSIAD): Recent Insights"]	Invited Plenary Lecture
2009	Nordiscience Forum (Novo Nordisk's International Scientific Meeting), Kyoto, Japan, (Lecture title: "Disorders of Water Balance and the Nephrogenic Syndrome of Inappropriate Antidiuresis")	Invited Plenary Lecture
2009	Osaka University, Osaka, Japan (Lecture title: "IGFs: Links to Cancer and Longevity")	Invited Lecture/Visiting Professor
2009	National Center for Child Health and Development, Tokyo, Japan (Lecture title: "Growth as a Barometer of Health")	Invited Lecture

2010	The Society for Pediatric Research/ Lawson Wilkins Pediatric Endocrine Society, Vancouver, Canada, ("Meet-the Professor" title: "Career Development: What's Next After Fellowship?")	Invited speaker/ "Meet-the Professor"
2011	9th Winter Symposium, Department of Child Health, Christian Medical College, Vellore, India (Lecture title: "Water & Sodium Balance: Current Concepts & Clinical Implications")	Invited Plenary Lecture
2011	World Professional Association for Transgender Health (WPATH) Biennial Symposium (International), Atlanta, GA	Invited speaker/ panel presentation
2012	1st St. Luke's International Conference on Pediatrics: Enhancing Pediatric Care with the Experts, Global City, Taguig City (Manila), Philippines (2 Lectures: "Gender Non-Conforming/Transgender Youth: Endocrine Considerations"; "Abnormalities of Puberty"; Case Discussant: "Disorders of Sex Development")	Invited Plenary Lectures
2013	World Professional Association for Transgender Health (WPATH) ICD-11 Consensus Meeting, San Francisco, CA	Invited Participant
2014	World Professional Association for Transgender Health (WPATH) Biennial Symposium, Bangkok, Thailand	Invited Symposium speaker
2014	Chulalongkorn University, Bangkok, Thailand (Lecture title: "Gender Nonconforming Transgender Youth: Endocrine Considerations")	Invited Lecture/Visiting Professor

INVITED PRESENTATIONS - NATIONAL

1983	The Endocrine Society Annual Meeting	Platform
1985	Endocrine Days, Seattle Washington	Invited lecture
1986	The Endocrine Society Annual Meeting	Platform
1987	The Clinical Research Center Program Directors' Biennial Meeting, NIH, Williamsburg, VA	Lecture
1987	Growth Disorders: Diagnostic and Therapeutic Dilemmas, Eli Lilly, Boston, MA	Invited lecture
1989	Society for Pediatric Research Annual Meeting	Poster
1990	Society for Pediatric Research Annual Meeting	Poster
1990	The Endocrine Society Annual Meeting	Poster
1990	American Academy of Pediatrics Postgraduate Course "Recent Advances in Endocrinology", Seattle, WA	Invited lectures (2)

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1990	Eli Lilly Symposium "Roundtable Discussion Group on Current Issues in Pediatric Endocrinology", Dallas, TX	Invited lecture and Session chair
1991	NIH Workshop on Biological Consequences of Early Placental Loss, San Juan, Puerto Rico	Invited lecture
1991	The Endocrine Society Annual Meeting	Poster
1992	American Academy of Pediatrics Annual Meeting, San Francisco, CA	Invited lecture
1992	The Endocrine Society Annual Meeting	Poster
1994	The Endocrine Society Annual Meeting	Poster and Session chair
1994	Genentech National Cooperative Growth Study Symposium, Orlando, FL	Session Chair
1995	American Academy of Pediatrics, PREP: The Course, Santa Monica, CA	Invited lectures (2)
1995	The Endocrine Society Annual Meeting	Poster
1995	American Academy of Pediatrics, PREP: The Course, Minneapolis, MN	Invited lectures (2)
1997	The Endocrine Society Annual Meeting	Poster
1998	The Endocrine Society Annual Meeting	Poster
1999	The Endocrine Society Annual Meeting	Poster
2000	The Endocrine Society Annual Meeting	Poster and Session chair
2001	The Endocrine Society Annual Meeting	Poster
2002	The Endocrine Society Annual Meeting	Poster
2004	The Endocrine Society Annual Meeting	Poster
2003	Society for Women's Health Research: Fourth Annual Conference on Sex and Gene Expression, Winston-Salem, NC	Invited lecture and Session chair
2004	Society for Pediatric Research Annual Meeting	Poster
2005	The Endocrine Society Annual Meeting	Poster
2005	American Academy of Pediatrics, PREP: The Course, Miami, FL	Invited lectures (2)
2005	American Academy of Pediatrics, PREP: The Course, Portland, OR	Invited lectures (2)
2005	GeNeSIS Symposium and Investigators Meeting, Washington, D.C.	Session chair

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2006	The Endocrine Society Annual Meeting, Boston, MA (Symposium lecture title: "How We Define IGF-I Deficiency")	Invited lecture
2006	The Endocrine Society's Clinical Endocrinology Update Course, San Francisco, CA (Lecture title/ "Meet-the Professor": "Management of Type 2 Diabetes in Adolescence")	Invited lecture/ "Meet-the-Professor"
2006	Serono GH Monitor Investigator Meeting, Symposium on Disorders of Water Balance, San Francisco, CA, 2006	Invited Plenary Lecture
2007	The Endocrine Society Annual Meeting	Poster
2008	American Academy of Pediatrics, PREP: The Course, Tempe, AZ, 2008	Invited lectures (2)
2008	The Endocrine Society Annual Meeting	Poster
2008	Society for Pediatric Research Annual Meeting	Session Co-Chair
2008	Lawson Wilkins Pediatric Endocrine Society Annual Meeting	Session Co-Chair
2009	American Academy of Pediatrics, PREP: The Course, Savannah, GA	Invited lectures (2)
2009	The Endocrine Society Annual Meeting, Washington, DC (Lecture title/ "Meet-the-Professor": "Hyponatremia in Infants & Children")	Invited speaker/ "Meet-the-Professor"
2009	The Endocrine Society Annual Meeting	Poster
2009	American Academy of Pediatrics, PREP: The Course, Portland, OR	Invited lectures (2)
2009	Disorders of Sex Development (DSD) Research and Quality Improvement Symposium, University of Michigan Initiative on Rare Disease Research, Ann Arbor, MI	Invited participant
2010	The Endocrine Society Annual Meeting, San Diego, CA (Lecture title/ "Meet-the-Professor": "Hyponatremia in Infants & Children")	Invited speaker/ "Meet-the-Professor"
2010	American Academy of Pediatrics, NeoPREP, Newport Beach, CA	Invited lectures (2)
2012	45th Annual Advances & Controversies in Clinical Pediatrics, UCSF, San Francisco, CA (Lecture title: "Gender-Variant/Transgender Youth: Endocrine Considerations")	Invited lecture
2012	The Endocrine Society Annual Meeting	Session Co-Chair
2012	American Academy of Pediatrics, PREP: The Course, San Diego, CA	Invited Lecture and Case Presentations

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2013	Miami Children's Hospital 16th Annual Pediatric Board Review Course	Invited Lecture and Case Presentations
2013	National Transgender Health Summit (sponsored by UCSF), Oakland, CA (Lecture title/"The Biology of Gender")	Invited Lecture and Panel Presentations
2013	Pediatric Endocrine Society Annual Meeting: Plenary Ethics Debate: "Approach to the Prepubertal Gender Non-Conforming Child: Should Intervention Attempt to Support the Assigned or Affirmed Gender?"	Program Chair and Speaker
2013	American Academy of Pediatrics, PREP: The Course, Portland, OR	Invited Lecture and Case Presentations
2013	The Endocrine Society Annual Meeting	Symposium Chair
2013	American Academy of Pediatrics: "Mind Matters for Pediatric Practitioners", San Francisco, CA (Lecture title: "Gender Nonconforming/ Transgender Youth: Endocrine Considerations")	Invited Lecture
2014	American Academy of Pediatrics, NeoPREP: An Intensive Review and Update of Neonatal/Perinatal Medicine, San Diego, CA (Lecture title: "Neontal Thyroid Disorders")	Invited lecture
2014	UCSF CME: Diabetes Update and Advances in Endocrinology and Metabolism (Lecture title: "Gender Nonconforming/ Transgender Youth: Endocrine Considerations")	Invited Lecture
2014	1st Annual Disorders of Sex Development-Translational Research Network (DSD-TRN)) and Accord Alliance (AAN) Workshop, Phoenix Children's Hospital, Phoenix, AZ	Invited participant
2014	Endocrine Society Annual Meeting	Symposia (2) Chair
2014	UCSF CME: Current Trends in DSD Management	Course Chair and Lecturer

INVITED PRESENTATIONS - REGIONAL AND OTHER INVITED PRESENTATIONS

1983	Pediatric Grand Rounds, John Muir Hospital, Veterans Administration Hospital, San Francisco, Santa Rosa Community Hospital, Fresno Valley Children's Hospital, University of the Pacific, Mt. Zion Hospital, Oak Knoll Naval Hospital	Invited lectures
1984	Pediatric Grand Rounds, UCSF	Invited lecture
1985	Pediatric Grand Rounds, UCSF	Invited lecture

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1985	Western Socity for Pediatric Research Annual Meeting	Platform
1986	Pediatric Grand Rounds, UCSF	Invited lecture
1987	Pediatric Grand Rounds, UCSF	Invited lecture
1989	Visiting Professor, University of Florida, Gainesville, FL	Invited lecture
1989	Visiting Professor, University of Pittsburgh, Pittsburgh, PA	Invited lecture
1989	Pediatric Grand Rounds, UCSF	Invited lecture
1990	Pediatric Grand Rounds, UCSF	Invited lecture
1992	Rocky Mountain Endocrine Society, Salt Lake City, UT	Invited lectures (2)
1993	Western Socity for Pediatric Research Annual Meeting	Session Co-Chair
1993	Organization of Pediatric Endocrinologists of California, Sonoma, CA	Invited lecture
1993	Pediatric Grand Rounds, San Francisco General Hospital	Invited lecture
1994	Organization of Pediatric Endocrinologists of California, Yosemite, CA	Meeting Chair
1995	Pediatric Grand Rounds, San Francisco General Hospital	Invited lecture
1997	Visiting Professor, University of Utah, Salt Lake City, UT	Invited lecture
1998	Visiting Professor, University of Washington, Seattle, WA	Invited lecture
1998	American Academy of Pediatrics Annual Meeting, St. Petersburg, Florida	Invited lecture
1998	Genentech, Inc., South San Francisco, CA	Invited lecture
1998	Pediatric Grand Rounds, Fresno Medical Education Program	Invited lecture
1999	Pediatric Grand Rounds, UCSF	Invited lecture
2000	Natural Cooperative Growth Study (co-sponsored by University of Oregon and Genentech, Inc.), San Francisco, CA	Invited lecture
2000	"Advances and Changing Trends" (Pediatrics), The Lloyd Noland Foundation, Orlando, FL	Invited lectures (2)
2000	Michigan State Medical Society Annual Scientific Meeting, Detroit, MI	Invited Plenary Lecture
2000	Pediatric Grand Rounds, San Francisco General Hospital	Invited lecture

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2001	UCSF Diabetes Center (Lecture title: "Insulin-like Growth Factors and Skeletal Muscle Differentiation")	Invited lecture
2002	"Ninth Annual Pediatrics Update", The Lloyd Noland Foundation, Hilton Head Island, SC	Invited lectures (3)
2003	Symposium Medicus Conference on Adolescent Medicine, Puerto Rico	Invited lectures (3)
2004	Pediatric Grand Rounds, UCSF (Lecture title: "Insulin-like Growth Factors: Not Really Like Insulin")	Invited lecture
2005	Endocrine Grand Rounds, UCSF (Lecture title: "Nephrogenic Syndrome of Inappropriate Antidiuresis")	Invited lecture
2005	Symposium Medicus Conference on Pediatrics, Yosemite, CA	Invited lectures (3)
2006	Pediatric Grand Rounds, Childrens Hospital Los Angeles, University of Southern California (Lecture title: "Nephrogenic Syndrome of Inappropriate Antidiuresis")	Invited lecture
2006	UCSF Diabetes Update and Advances in Endocrinology and Metabolism, "Nephrogenic Syndrome of Inappropriate Antidiuresis (NSIAD): A Paradigm for Activating Mutations Causing Endocrine Disease", San Francisco, CA	Invited lecture
2006	"Childhood Matters" Radio Show, "Diabetes in Childhood: Who's at Risk?", KISS-FM, San Francisco, CA	Invited speaker (radio)
2006	Pediatric Grand Rounds, Sutter Medical Center, Santa Rosa, CA (Lecture title: "Growth as a Barometer of Health")	Invited lecture
2006	Pediatric Grand Rounds, California Pacific Medical Center, San Francisco, CA (Lecture title: "Growth Hormone and IGF-I Treatment for Short Stature: Current Concepts and Controversies")	Invited lecture
2007	Pediatric Endocrine Grand Rounds, University of California Los Angeles (Lecture title: "Activating V2 Vasopressin Receptor Mutations")	Invited lecture
2007	UCSF Pediatric Diabetes Symposium: "Type 1 Diabetes: Primary and Secondary Prevention"	Invited lecture
2008	Pediatric Grand Rounds, University of Massachusetts, Baystate Children's Hospital: "Nephrogenic Syndrome of Inappropriate Antidiuresis (NSIAD): A Paradigm for Activating Mutations Causing Endocrine Dysfunction"	Invited lecture

2008	UCSF Pediatric Diabetes Symposium: "Can We Prevent Type 1 Diabetes? : Research Update"	Invited lecture
2008	Juvenile Diabetes Research Foundation, Hawaii Chapter, Honolulu, HI: "Update in Type I Diabetes Research: Honeymoon Prolongation and Primary Prevention"	Invited lecture
2009	Organization of Pediatric Endocrinologists of California, San Francisco, CA, "IGFs: Links to Cancer and Longevity"	Invited lecture
2009	Pediatric Grand Rounds, Marin General Hospital, San Francisco, CA, (Lecture title: "Growth Disorders: Current Concepts and Management")	Invited lecture
2009	Pediatric Grand Rounds, San Francisco General Hospital (Lecture title: "Gender Identity Disorder in Pre-Adolescents & Adolescents")	Invited lecture
2009	UCSF School of Medicine, Pediatric Interest Group: "Career Development in Pediatric Endocrinology"	Invited speaker
2010	Pediatric Grand Rounds, UCSF (Lecture title: "Gender Variant/ Transgender Youth: Endocrine Considerations")	Invited lecture
2010	Children's Hospital Oakland Research Institute, Oakland, CA, "Gender Variant/ Transgender Youth: Endocrine Considerations"	Invited lecture
2010	Symposium Medicus Conference on Pediatrics (Lecture titles: "Abnormalities of Puberty", "Update in Type 1 Diabetes", "Growth as a Barometer of Health") Kauai, Hawaii	Invited lectures (3)
2010	Gender Spectrum 4th Annual Family Conference (Lecture title: "The Use of Pubertal Blockers in Gender Variant Youth", Berkeley, CA	Invited lecture
2010	UCSF School of Medicine, Pediatric Interest Group: "Career Development in Pediatric Endocrinology"	Invited speaker
2010	UCSF Pediatric Noon Cnference Series (Lecture title: "Neonatal Thyroid Disorders")	Invited lecture
2011	Pediatric Grand Rounds, Riley Hospital, University of Indiana, Indianapolis, IN, (Lecture title: "Gender Variant/Transgender Youth: Endocrine Considerations")	Invited lecture
2011	Pediatric Grand Rounds, Lucile Packard Children's Hospital, Stanford University, Stanford, CA, (Lecture title: "Gender Variant/Transgender Youth: Endocrine Considerations")	Invited lecture

2011	UCSF Pediatric Noon Cnference Series (Lecture title: "Abnormalities of Puberty")	Invited lecture
2011	Gender Spectrum 5th Annual Family Conference (Lecture title: "The Biology of Gender"), Berkeley, CA	Invited lecture
2011	Gender Spectrum Professional's Workshop, Berkeley, CA ("The Use of Pubertal Blockers in Gender Variant Youth")	Invited speaker, panel presentation
2011	"Mind-the-GAP" Mental Health Professionals Workshop, Oakland, CA (Lecture title: "The Use of Pubertal Blockers in Gender Variant Youth")	Invited lecture
2011	8th Annual Great Plains Pediatric Endocrine Symposium (Lecture title: "Gender Variant/Transgender Youth: Endocrine Considerations")	Invited Plenary Lecture
2011	American Psychiatric Association (APA) Institutes on Psychiatric Services Annual Meeting (Presentation title: "The Child and Adolescent Gender Center: A UCSF/ Community Collaborative")	Invited speaker, panel presentation
2011	UCSF School of Medicine, Pediatric Interest Group: "Career Development in Pediatric Endocrinology"	Invited speaker
2012	Warren Alpert Medical School of Brown University Adult and Pediatric Grand Rounds, Providence, RI (Lecture title: "Gender Variant/Transgender Youth: Endocrine Considerations")	Invited lecture
2012	Endocrine Grand Rounds, UCSF School of Medicine, Department of Medicine, Division of Endocrinology, San Francisco, CA (Lecture title: "Gender Non-Conforming/Transgender Youth: Endocrine Considerations")	Invited lecture
2012	Gender Spectrum 6th Annual Family Conference (Lecture title: "The Biology of Gender"), Berkeley, CA	Invited lecture
2012	Gender Spectrum 6th Annual Family Conference ("Safe Sports for Transgender Youth"; "Medical Panel: Concerns for Transgender Youth"), Berkeley, CA	Invited speaker, panel presentations
2012	Gender Spectrum Professional's Workshop, Berkeley, CA ("The Use of Pubertal Blockers in Gender Variant Youth")	Invited speaker
2012	UCSF School of Medicine, Pediatric Interest Group: "Career Development in Pediatric Endocrinology"	Invited speaker

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2012	Pediatric Grand Rounds, Santa Clara Valley Medical Center, San Jose, CA (Lecture title: "Gender Non-Conforming/Transgender Youth: Endocrine Considerations")	Invited lecture
2013	Pediatric Grand Rounds, Children's Hospital of Philadelphia (CHOP), Philadelphia, PA, (Lecture title: "Gender Non-Conforming/Transgender Youth: Endocrine Considerations")	Invited lecture
2013	CHOP-Hospitals of the University of Pennsylvania (HUP) Combined Endocrine Grand Rounds, Philadelphia, PA, (Lecture title: "The Biology of Gender")	Invited lecture
2013	Pediatric Grand Rounds, Marin General Hospital, Greenbrae, CA (Lecture title: "Gender Nonconforming/Transgender Youth: Endocrine Considerations")	Invited lecture
2013	UCSF Trans Health Seminar	Invited lecture
2013	Pediatric Grand Rounds, John Muir Medical Center, Walnut Creek, CA (Lecture title: "Gender Nonconforming/Transgender Youth: Endocrine Considerations")	Invited lecture
2013	Grand Rounds, Children's Hospital & Research Center Oakland, Oakland, CA (Lecture title: "Gender Nonconforming/Transgender Youth: Endocrine Considerations")	Invited lecture
2013	Gender Spectrum 7th Annual Family Conference (Lecture title: “The Biology of Gender”), Berkeley, CA	Invited lecture
2013	Gender Spectrum Professional's Workshop, Berkeley, CA	Invited Lecture, Panel Presentations
2013	PFLAG, San Francisco Chapter	Invited speaker
2013	Expert Panel on Transgender Health for Adolescent Clients, Callen-Lorde Community Health Center, New York, NY	Invited speaker/panelist
2013	43rd Annual Fall Conference, Children's Hospital & Research Center Oakland, Monterey, CA (Lecture title: "Gender nonconforming/Transgender Youth: Endocrine Considerations")	Invited Lecture
2014	Medicine Grand Rounds, Beth Israel Medical Center, New York, NY (Lecture title: "Transgender Youth: Endocrine Considerations")	Invited Lecture
2014	UCSF Trans Health Seminar	Invited lecture

2014	Pediatric Grand Rounds and Visiting Professor, University of Wisconsin, Madison, WI (Lecture title: "Gender Nonconforming/Transgender Youth: Endocrine Considerations")	Invited Lecture and Visiting Professor
2014	Combined Adult/Pediatric Endocrine Grand Rounds, University of Wisconsin, Madison, WI (Lecture title; "The Biology of Gender")	Invited Lecture
2014	Kaiser Permanente CME: Transgender Care for the Pediatric Mental Health Provider (Lecture title: The Biology of Gender")	Invited Lecture/ Panelist
2014	Gender Spectrum 8th Annual Family Conference (Lecture title: "The Biology of Gender"), Moraga, CA	Invited lecture
2014	Gender Spectrum Professional's Workshop, Moraga, CA	Invited Lecture, Panel Presentations
2014	PFLAG Regional Convention, Napa, CA	Invited speaker
2014	47th Annual Clinical Advances in Pediatrics Symposium, Children's Mercy Hospital, Kansas City, MO (Lecture title: "Gender nonconforming/Transgender Youth: Endocrine Considerations")	Invited Keynote Address
2014	Endocrine Grand Rounds and Visiting Professor, University of Cincinnati Hospital Medical Center, Cincinnati, OH (Lecture title: Gender Nonconforming/Transgender Youth: Endocrine Considerations")	Invited Lecture and Visiting Professor

CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT ACTIVITIES

2006	The Endocrine Society Annual Meeting
2006	The Lawson Wilkins Pediatric Endocrine Society Annual Meeting
2007	The Endocrine Society Annual Meeting
2007	The Lawson Wilkins Pediatric Endocrine Society Annual Meeting
2008	The Endocrine Society Annual Meeting
2008	The Lawson Wilkins Pediatric Endocrine Society Annual Meeting
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2012	The Endocrine Society Annual Meeting
2012	The Pediatric Endocrine Society Annual Meeting
2013	The Pediatric Endocrine Society Annual Meeting
2013	The Endocrine Society Annual Meeting
2014	The Pediatric Endocrine Society Annual Meeting
2014	Endocrine Society Annual Meeting
2015	Endocrine Society Annual Meeting
2015	The Pediatric Endocrine Society Annual Meeting

GOVERNMENT AND OTHER PROFESSIONAL SERVICE

1995 - 1995	USDA	Grant Review Panel
2006 - 2012	NIH/NIDDK, TrialNet Eligibility Committee	Member

UNIVERSITY AND PUBLIC SERVICE

SERVICE ACTIVITIES SUMMARY

As detailed above, the highlights of my service activities include the following: a) UCSF Campus-wide: I have served on the Committee for Human Research for 3 years was appointed to the UCSF LGBT Center of Excellence Task Force; b) School of Medicine: I was an inaugural lecturer in the 2nd year LifeCycle course and PISCES Preceptor for the 3rd year Pediatrics curriculum; c) Departmental Service: I have served on a variety of committees, most notably the Pediatric Ambulatory Clinic Operations Committee and the Pediatric Clinical Enterprise Committee. I served as the Pediatric Endocrine Clinic Director, the Pediatric Endocrine Director of the multi-disciplinary Disorders of Sex Development Clinic, and currently serve as Medical Director of the Child and Adolescent Gender Center. I also served as the Program Director for Pediatric Endocrinology Fellowship Training; and d) Public Service: My activities have focused on volunteering for the Visiting Nurses and Hospice program, volunteering for various Diabetes programs (family support groups, Diabetes camp, etc.), speaking at family conferences and professional workshops focused on the care of gender variant/ transgender youth and adolescents, and helping to raise money for financially challenged, promising figure skaters in the Bay Area.

UCSF CAMPUSWIDE

2000 - 2000	Search Committee for Division Chief, Reproductive Endocrinology	Member
2002 - 2003	Committee on Human Research	Member
2004 - 2006	Committee on Human Research	Member
2010 - 2010	Search Committee for Director, Mass Spectrometry Program	Member
2011 - present	UCSF LGBT Center of Excellence Task Force	Member

2012 - 2013	2013 National Trans Health Summit Planning Committee	Member
2014 - present	UCSF LGBT Leadership Collaborative on Education, Research, and Clinical Care	Member

SCHOOL OF MEDICINE

1994 - 2015	Various Ad hoc Promotion Review Committees	Member
1997 - 1999	Diabetes Center Planning Committee	Member
2002 - 2003	Life Cycle course, 2nd year Curriculum	Team Leader, Small Group Designer and Leader
2002 - 2015	Life Cycle course, 2nd year Curriculum	Lecturer (2)
2003 - 2007	Life Cycle course, 2nd year Curriculum	Small Group Designer and Leader
2004 - 2009	Foundations of Patient Care	Preceptor
2006 - 2007	UCSF Intersex Task Force	Member
2007 - 2014	Parnassus Integrated Student Clinical Experiences (PISCES), 3rd year Curriculum	Preceptor in Pediatrics (20 clinics/year)

SCHOOL OF DENTISTRY

2003 - 2015	Craniofacial Anomalies CFA 206	Lecturer

DEPARTMENTAL SERVICE

1986 - 1987	Intern Selection Committee	Member
1992 - 1993	Moffitt Ward Education Committee	Member
1993 - 1994	Endocrinology/Neurology/Neurosurgery/Hematology/Oncology, Panel A, Subspecialty Outpatient Rotation	Director
1993 - 2014	Intern Selection Committee	Member
2000 - 2000	Search Committee, Faculty Member, Division of Pediatric Endocrinology	Member
2006 - 2007	UCSF High School Summer Internship program	Preceptor/ Mentor
2006 - 2015	Pediatric Endocrine Outpatient Services	Director
2008 - 2009	Karlsberger Steering Committee	Member

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2008 - 2011	Pediatric Endocrinolgy FellowshipTraining Program	Associate Program Director
2008 - present	Disorders of Sexual Development (DSD) Clinic	Pediatric Director
2009 - 2009	Ward Revision Task Force	Member
2009 - 2012	Outpatient Re-engineering Steering Committee	Member
2009 - 2010	Clinical Excellence Task Force, UCSF Pediatric Residency Program	Member
2010 - present	Child and Adolescent Gender Center	Medical Director and Steering Committee co-Chair
2011 - 2015	EPIC	"Superuser"
2012 - 2015	Pediatric Endocrinolgy FellowshipTraining Program	Program Director
2012 - 2015	Pediatric Ambulatory Clinic Operations Committee	Member
2012 - 2015	Pediatric Clinical Enterprise Committee	Member

COMMUNITY AND PUBLIC SERVICE

1991 - 2000	Visiting Nurses and Hospice of San Francisco	Volunteer, 1 evening/week
1995 - 2013	Diabetes Youth Foundation's Bearskin Meadow Summer Camp	Medical volunteer, 1 week/ year
1995 - 2002	Adult Skating Program Committee, US Figure Skating Association	Member
1996 - 1996	March of Dimes Walk Steering Committee, San Francisco, CA	Member
2000 - 2001	Skating Club of San Francisco	Member, Board of Directors, and Vice-President
2002 - 2012	Numerous Bay Area Diabetes Family Support Groups	Invited speaker
2007 - present	Skate San Francsco (Figure Skating Competition)	Medical volunteer
2008 - 2012	Diabetes Youth Foundation Annual Figure Skating event	Medical volunteer and Skating Instructor

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2009 - present	Ice Bridges, a non-profit corporation which assists financially challenged, promising figure skaters in the San Francisco Bay Area	Member, Board of Directors
2010 - present	Bay Area Family Support Groups and Mental Health Professional Workshops for Gender Variant/ Transgender Youth and Adolescents	Invited speaker

CONTRIBUTIONS TO DIVERSITY

CONTRIBUTIONS TO DIVERSITY

I began my work with the care of gender nonconforming/transgender youth in January, 2009, and led efforts to create the multi-disciplinary Child and Adolescent Gender Center (CAGC), which formally opened its doors in May, 2012. I serve as Medical Director of the CAGC, serving >1300 gender nonconforming/ transgender youth, and oversee all clinical and research activities of the CAGC.

TEACHING AND MENTORING

TEACHING SUMMARY

In my current role as Emeritus Professor on Recall, I supervise postdoctoral fellows, residents, and medical students during one clinic/week (5-6 hr/wk). In addition, my current teaching responsibilities include: Lecturer in the Medicine/Pediatrics combined Endocrinology Fellows Course (2 hr); In addition to my UCSF teaching responsibilities, my teaching includes lecturing at a number of symposia on transgender health.

FORMAL TEACHING

	Academic Yr	Course No. & Title	Teaching Contribution	School	Class Size
	1986 - 2017	Adolescent Core Seminar Series 180.01C	Lecturer		
	2002 - 2015	Life Cycle, 2nd yr Med. Sch. Curr	Lecturer		Entire 2nd yr class
	2002 - 2007	Life Cycle, 2nd yr Med. Sch. Curr	Small Group Designer and Leader		25
	2003 - 2015	Craniofacial Anomalies CFA 206	Lecturer		
	2007 - 2014	Parnassus Integrated Student Clinical Experiences (PISCES), 3rd yr Med Sch Curr	Preceptor		1 student/ year

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	Academic Yr	Course No. & Title	Teaching Contribution	School	Class Size
	2000 - 2009	Foundations of Patient Care IDS 132A	Preceptor		

INFORMAL TEACHING

1983 - 2015 Clinical: Weekly inpatient Pediatric Endocrine teaching conference: 1.5 hr/week x 48 weeks = 72 hr/year

1994 - present Clinical: Outpatient: Supervising/teaching: One clinic/week (5-6 hr) is a teaching clinic = 5-6 hr/week (including outpatient follow-up teaching) = 275 hr/year

MENTORING SUMMARY

I mentored Dr. Adi during his NIH K-08 Award in studies focused on understanding the molecular mechanisms through which Insulin-like Growth Factors influence the decision of skeletal myoblasts to proliferate or differentiate.
I mentored Dr. Cheung in clinical/translational studies investigating Aquaporin-2 excretion in the recently described Nephrogenic Syndrome of Inappropriate Antidiuresis.

PREDOCTORAL STUDENTS SUPERVISED OR MENTORED

Dates	Name	Program or School	Mentor Type	Role	Current Position
2003 - 2004	Dandan Liu	University of California, Berkeley		Supervised student for her Senior Honors Thesis	MD, Resident, UCSF
2007 - 2011	Linda Zhou, BS	Pre-doctoral student		Preceptor	Attending graduate school
2012 - 2012	Meaghan Pugh, RN, PNP	UCSF Advanced Practice Pediatric Nurse Practitioner Program		Clinical Preceptor	Clinical Practice
2013 - 2015	Tara Gonzalez	UC Berkeley-UCSF Joint Medical Program PRIME-US Program		Research Mentor	MS Class of 2015; MD Class of 2017

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POSTDOCTORAL FELLOWS AND RESIDENTS MENTORED

Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1983 - 1984	Elizabeth Schriock, M.D	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice, San Francisco, CA
1983 - 1984	David Harris, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Clin Prof Pediatrics, U. of Utah, Salt Lake City
1983 - 1984	Leona Cuttler, M.D	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Professor and Chief of Pediatric Endocrinology, Case Western Reserve U., Cleveland, OH
1983 - 1984	Berthold Hauffa, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Professor of Pediatrics, Universitat Essen, Germany
1983 - 1984	Robert Lustig, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Professor of Clinical Pediatrics, UCSF
1983 - 1984	Klaus Rodens, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Prof Pediatrics, U. of Ulm, Germany
1983 - 1984	J. Anthony Hulse, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Consultant Endocrinologist, St. Thomas Hospital, London

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1983 - 1985	Catherine Egli, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Chief of Pediatric Endocrinology, San Francisco Kaiser Hospital
1984 - 1985	David Stephure, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Prof Pediatrics and Chief of Pediatric Endocrinology, U. of Calgary, Canada
1984 - 1987	Bernard Silverman, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Former Assoc Prof and Chief of Ped Endo, Northwestern U., now Medical Director, Alkemes Inc.,
1984 - 1987	Jorge Daaboul, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Associate Professor of Pediatrics, U. of Florida, Gainesville, FL
1985 - 1987	Sharyn Solish, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice
1985 - 1988	Kenneth Attie, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Former Medical Director, Insmed Inc., Glen Allen, VA

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1986 - 1988	Norbert Albers, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Prof, Children's Hospital, U. of Bonn, Germany
1986 - 1989	Carol Hart, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Clin Prof Pediatrics, UC, San Diego, CA
1987 - 1989	Nelson Ramirez, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Deceased during fellowship
1987 - 1989	Stephen Gitelman, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Professor of Clinical Pediatrics, UCSF
1988 - 1988	Gregory Glasscock, Ph.D., M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Neonatologist
1988 - 1989	Carol Ishimatsu, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice, Downey, CA
1988 - 1989	Wen-Yu Tsai, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Prof of Pediatrics, Director, Pediatric Endocrinology, National Taiwan U.

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1988 - 1988	Sushma Kaul, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Clin Prof Pediatrics, Hackensack Medical Center, New Jersey
1989 - 1991	Klaus Hartmann, M.D.	Post-Doc Research Fellow		Laboratory Research Preceptor	Asst Prof Pediatrics, U. of Frankfurt, Germany
1989 - 1992	Juan Sanchez, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Prof Pediatrics, Indiana U. Medical Center, Indianapolis
1990 - 1992	Henry Rodriguez, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Associate Professor
1990 - 1993	David Paul, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Chief of Pediatric Endocrinology, David Grant Medical Center, Travis AFB, Sacramento, CA; Asst Clin Prof Pediatrics, UC, Davis
1990 - 1993	Lawrence Silverman, M.D.	Clinical and Research Fellow		Clinical and Laboratory Preceptor	Asst Prof Pediatrics, RWJ-UMDNJ, Chief of Ped Endo, Morristown Mem. Hosp.

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1991 - 1994	Floyd Barry, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Training Chief for Pediatrics, McLennan Family Practice Residency Program, Waco, TX
1991 - 1994	Pat Mahachoklertwattana, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assoc Prof Pediatrics; Chief of Pediatric Endocrinology, Mahidol U., Bangkok, Thailand
1993 - 1996	Debra Devoe, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Clin Prof Pediatrics, U. Southern California and Los Angeles Children's Hospital, CA
1993 - 1996	David Geller, M.D., Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Prof Pediatrics, UCLA Cedars-Sinai Medical Center, Los Angeles, CA
1994 - 1996	Sudha Mootha, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Prof Clin Pediatrics, U. Texas Southwestern Medical Center, Dallas
1994 - 1997	Saleh Adi, M.D.	Clinical and Research Fellow		Clinical and Laboratory Preceptor	H. S. Professor of Pediatrics, UCSF

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
1996 - 1999	Valérie Schwitzgebel, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Professor of Pediatrics, U of Geneva, Switzerland
1996 - 1998	Bassam Bin-Abbas, M.D.	Clinical and Research Fellow		Clinical and Laboratory Preceptor	Asst Prof Pediatrics, King Faisal U, Riyadh, Saudi Arabia
1998 - 1999	Peter Contini, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice, Moraga, CA
1998 - 2001	Louise Greenspan, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Pediatric Endocrinology, San Francisco Kaiser Hospital; Asst Clin Prof Pediatrics, UCSF
1998 - 2001	Jane Lee, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Clinical Research Scientist, Genentech Inc., South San Francisco, CA
1999 - 2002	Susan Conrad, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Formerly Attending Endocrinologist, Oakland Children's Hospital, Oakland, CA; Now in Private Practice

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2000 - 2002	Chaluntorn Preeyasombat, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Prof Pediatrics, Ramathibadi Hospital, Mahidol U., Bangkok Thailand
2001 - 2003	Nicola Tiffin, Ph.D.	Post-Doc Research Fellow		Laboratory Research Preceptor	Research Scientist, University of Western Cape, South Africa
2001 - 2004	Heidi Gassner, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Chief of Pediatric Endocrinology, Sacramento Kaiser Hospital
2002 - 2005	Qing Dong, M.D., Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Chief of Pediatric Endocrinology, Chinese Hospital, San Francisco; Clinical Assistant Professor of Pediatrics, UCSF
2003 - 2007	Gary Meyer, Ph.D.	Post-Doc Research Fellow		Laboratory Research Preceptor	Private Industry
2003 - 2006	Eric Huang, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Attending Physician, Pediatric Endocrinology, Morristown Hospital, New Jersey

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2004 - 2006	Brian J. Feldman, M.D.,Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assist. Prof of Pediatrics, Stanford U
2004 - 2006	Clement Cheung, M.D., Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Adjunct Professor of Pediatrics, UCSF
2004 - 2007	Maureen A. Su, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Professor, Dept. of Pediatrics, U. of North Carolina
2005 - 2007	Andrew Bremer, M.D., Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Professor of Pediatrics, Vanderbilt University, Nashville, TN
2005 - 2008	Sayali Ranadive, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Attending Formerly Endocrinologist, Oakland Children's Hospital, Oakland, CA; Now in Private Practice
2005 - 2007	Roger Long, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Asst Clinical Professor, UC Davis Medical Cntr

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2006 - 2009	Alison Reed, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Attending Pediatric Endocrinologist, California Pacific Medical Center, San Francisco, CA
2007 - 2010	William Charlton, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Attending Physician, Joe DiMaggio Children's Hospital, Broward County, FL
2007 - 2010	Ivy Aslan, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Attending Endocrinologist, Oakland Children's Hospital, Oakland, CA
2008 - 2009	Jennifer Cordier, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice
2008 - 2010	Taninee Sahakitrungruang, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Prof of Pediatrics, Chuylalongkorn U, Bangkok, Thailand
2009 - 2011	Jenise Wong, M.D., Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Instructor, UCSF

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2009 - 2012	Thu Ho, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice
2009 - 2012	Anjali Jain, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice
2010 - 2013	Andrea Gerard Gonzalez, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Professor of Pediatrics, Barbara Davis Diabetes Center, Denver, CO
2010 - 2013	Lisa Taylor, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Private Practice
2010 - 2016	Stanley Vance, Jr., MD	Resident in Pediatrics; then Clinical Fellow, Adolescent Medicine		Research Mentor	Assistant Professor, UCSF
2011 - 2014	Amy Mugg, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2011 - 2014	Sara Moassesfar, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2012 - 2015	Priya Prahalad, M.D., Ph.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Professor, Stanford University
2012 - 2015	Joshua Tarkoff, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Clinical practice
2012 - 2015	Paula Jossan, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Clinical practice
2013 - 2014	Vanita Jindal, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Clinical practice
2013 - 2016	Nicholas Heiniger, M.D.	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Clinical practice
2013 - 2016	Stanley Vance, Jr., M.D.	Clinical Fellow, Adolescent Medicine		Research Mentor	Assistant Professor, UCSF
2014 - present	Eric Bomberg, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2015 - 2019	Janet Lee, MD, MPH	Clinical Fellow, Pediatric Endocrinology		Clinical and Research Mentor	Instructor, UCSF

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2015 - 2017	Liat Perl, MD	Clinical Fellow, Pediatric Endocrinology		Clinical and Research Mentor	In Training, Israel
2016 - 2019	Ayca Cakmak, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2016 - 2019	Alyssa Huang, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	Assistant Professor, University of Washington
2017 - present	Armaiti Mody, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2017 - present	Jenny Zabinsky, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2018 - present	Fatema Abdul Hussein, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2018 - present	Hannah Chesser, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2018 - present	Caroline Schulmeister, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor and Research Mentor	In Training

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Dates	Name	Fellow	Mentor Role	Faculty Role	Current Position
2019 - present	Isabella Niu, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor	In Training
2019 - present	Abby Cobb-Walch, MD	Clinical Fellow, Pediatric Endocrinology		Clinical Preceptor and Research Mentor	In Training

FACULTY MENTORING

Dates	Name	Position while Mentored	Mentor Type	Mentoring Role	Current Position
2010 - 2011	Clement Cheung, M.D., Ph.D.	Assistant Professor		Preceptor/ mentor for Aquaporin-2 research project and manuscript preparation	Assistant Adjunct Professor of Pediatrics, UCSF
2016 - 2017	Ensile Lee, MD	Assistant Professor, Korea		Preceptor/mentor in Child and Adolescent Gender Center	Assistant Professor, Korea
2016 - present	Stanley Vance, Jr., MD	Assistant Professor		Research Mentor	Assistant Professor, UCSF
2019 - present	Janet Lee, MD	Instructor		Research Mentor	Instructor, UCSF

RESEARCH AND CREATIVE ACTIVITIES

RESEARCH AND CREATIVE ACTIVITIES SUMMARY

My current research is focused on optimizing multidisciplinary care for transgender youth. I am currently serving as Principal Investigator (Multiple PI format) of an NIH/NICHD R01 focused on Early Medical Treatment of Transgender Youth, and as co-Investigator on two additional NIH R01's focused on transgender youth.

My prior research has included both basic science and clinical investigation. My laboratory work has focused on two aspects of hormone receptor signaling. First, we extended our work in Insulin-like Growth Factor (IGF)-I receptor signaling to studies in human neuroblastoma (NBL). Specifically, we have explored the role of IGF signaling in the growth, motility, and invasiveness of human NBL cells. In collaborative studies with UCSF investigators from Pediatric Oncology, Neurology, Internal Medicine, and Radiation Oncology, we have observed

that small molecule inhibitors of the IGF-I receptor block growth, survival, and motility of NBL cells, and inhibit NBL growth in vivo in a xenograft model in nude mice. A manuscript summarizing portions of this work has been published in the Journal of Cellular Biochemistry. This work has been supported by a grant from the Thrasher Research Fund with matching funds from the UCSF Cancer Center. I also received, as Principal Investigator, a Basic Research grant for our work regarding IGF-I signaling in neuroblastoma from the John A. Kerner, M.D. Research Foundation. Also as Principal Investigator, I have received a Basic Research grant from ImClone Systems, Inc., to examine the therapeutic potential of a humanized monoclonal anti-IGF-I receptor antibody and radiation in neuroblastoma.

In addition, we have recently identified and characterized novel activating mutations in the vasopressin V2 receptor (V2R) that cause a Syndrome of Inappropriate Antidiuretic Hormone (SIADH)-like phenotype, yet without detectable ADH. We have named this syndrome "Nephrogenic Syndrome of Inappropriate Antidiuresis" (NSIAD), and have reported our findings in New England Journal of Medicine 352:34-40, 2005 (co-first-author). I have been engaged in collaborative studies to extend our characterization of NSIAD, with three specific aims: 1) explore further the molecular mechanisms responsible for the constitutive activity of the vasopressin V2R mutants, 2) further characterize the clinical phenotype of NSIAD patients and heterozygous carriers, and 3) explore the potential role of selective vasopressin V2R "inverse agonists" as a targeted treatment for this condition. This work has been carried out in collaboration with investigators from the Departments of Psychiatry and Cellular and Molecular Pharmacology at UCSF, the Department of Biochemistry, Division of Cell Signaling and Molecular Pharmacology, at the University of Montreal, and the Department of Medicine, University of Colorado School of Medicine. A manuscript summarizing this work with respect to V2R trafficking waspublished in Molecular Pharmacology, 2010, and a manuscript summarizing this work with respect to urinary aquaporin-2 excretion in this syndrome has just been submitted for publication.

With respect to clinical investigation, I have been an investigator in studies related to Type 1 Diabetes, studies related to growth disorders, and studies related to disorders of sex development (DSD). With respect to Type 1 Diabetes, I served as co-Investigator for TrialNet, a multi-center NIH-sponsored study focused on developing therapies to prevent Type 1 Diabetes Mellitus in high risk individuals. I have been co-Investigator on the TrialNet Natural History of Type 1 Diabetes study and on five intervention studies for patients with newly diagnosed Type 1 Diabetes : 1) TrialNet Mycophenolate Mofetil-Dacluzimab (MMF-DZB), 2) TrialNet Rituximab, 3) TrialNet CTLA-4 Ig, 4) Immune Tolerance Network Phase II trial of hOKT3 gamma1 (Ala-Ala), and 5) Immune Tolerance Network trial of thymoglobulin. In addition, I have been Principal Investigator at UCSF for the TrialNet Nutritional Intervention to Prevent (NIP) Type 1 Diabetes study examining the therapeutic potential of docosahexaenoic acid, an omega-3 fatty acid, in individuals at high-risk for developing this disorder, and am co-Investigator in the TrialNet Oral Insulin Prevention Trial.

With respect to growth disorders, I have served as the UCSF-site Principal Investigator for a multi-center trial investigating the therapeutic potential of recombinant human IGF-I for prepubertal children with Growth Hormone (GH) resistance.

With respect to studies of DSD, I have served as co-Principal Investigator for a NIH/ NICHD R01 multi-center study entitled "Disorders of Sex Development: Platform for Basic and Translational Research". The focus of this project has been to develop a multi-site infrastructure to support hypothesis-based research on the mechanisms of sexual development and evidence-based care for patients with DSD and their families.

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Effective April 1, 2011, I completed my basic laboratory work, shifting my research focus exclusively to clinical research. As noted above, my current research is focused on optimizing medical care of transgender youth, with particular emphasis on mental health and skeletal health outcomes of current treatment models.

RESEARCH AWARDS - CURRENT

1. 1R01HD082554-01A1	Principal Investigator (Multiple PI format)	20 % effort	Rosenthal (PI)
NIH/ NICHD		08/01/2015	06/30/2020
The Impact of Early Medical Treatment in Transgender Youth		$ 952,542 direct/yr 1	$ 5,732,531 total
This is a multicenter study which will be the first in the U.S. to evaluate the long-term outcomes of medical treatment for transgender youth. This study will provide essential, evidence-based information on the physiological and psychosocial impact, as well as safety, of hormone blockers and cross-sex hormones use in this population.			
2.	Principal Investigator	5 % effort	Rosenthal (PI)
San Francisco Department of Public Health		07/01/2017	06/30/2022
UCSF Child and Adolescent Gender Center Transgender Youth Support Program		$ 325,000 direct/yr 1	$ 1,625,000 total
To develop outreach and provide multidisciplinary services for transgender youth in the city of San Francisco			
Overall supervisor and consultant			
3. R01MH115349	Co-Investigator	10 % effort	Hong (PI)
NIH/ NIMH		07/01/2018	06/30/2023
Sex Hormone effect on Neurodevelopment: Controlled puberty in transgender adolescents			
This will be the first study of its kind to directly investigate longitudinal brain anatomy in young adolescents with gender dysphoria (GD). The study will utilize an innovative, cross-disciplinary approach that takes advantage of sophisticated imaging modalities to elucidate the interaction between sex hormone therapies and brain anatomy and connectivity in youth. Results from this interdisciplinary proposal will directly impact clinical care for individuals with GD and provide a much-needed empirical foundation for understanding the longitudinal impact of treatments that are already being used in clinical settings.			
Co-Investigator			
4. R01HD097122	Co-Investigator	3 % effort	Ehrensaft (PI)
NIH/ NICHD		03/21/2019	02/29/2024
Gender Nonconformity in Prepubescent Children: A Longitudinal Study			

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This project is a prospective longitudinal observational study of pre-pubertal children who are gender-nonconforming and their care. It is a four-site study involving U.S.-based university affiliated pediatric gender clinics. With a targeted N of 320 subjects, the objective of the proposed research is to provide evidence-based data to inform clinical care for prepubescent transgender and gender-nonconforming children (TGNC).

Co-Investigator

RESEARCH AWARDS - PAST

1. Site Principal investigator

NIH: Clinical Associate Physician, General Clinical Research Center — 1984 — 1987

Growth Hormone Releasing Hormone in Hypopituitarism

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2. Principal investigator

Academic Senate Committee on Research, University of California San Francisco — 1987 — 1988

Insulin-like Growth Factors and Childhood Growth Disorders

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3. Principal Investigator

Grant Award, School of Medicine, Research Evaluation and Allocation Committee, University of California San Francisco — 1987 — 1988

Insulin-like Growth Factors and Childhood Growth Disorders

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4. Principal Investigator

NIH/NICHD: Clinical Investigator Award — 1988 — 1991

Insulin-like Growth Factors and Childhood Growth Disorders

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5. Principal Investigator

March of Dimes: Basil O'Connor Starter Scholar Research Award — 1989 — 1992

Insulin-like Growth Factors and Childhood Growth Disorders

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6. Principal Investigator

Academic Senate Committee on Research, University of California San Francisco — 1991 — 1992

Insulin-like Growth Factors and Skeletal Muscle Differentiation

Prepared: May 26, 2020

7.	Principal Investigator		
	March of Dimes: Basic Research Grant	1992	1994
	Insulin-like Growth Factors and Skeletal Muscle Differentiation		
8.	Principal Investigator		
	NIH/NIDDK: FIRST Award	1992	1997
	Insulin-like Growth Factors and Skeletal Muscle Differentiation		$ 350,000 total
9.	Principal Investigator		
	March of Dimes: Basic Research Grant	1995	1997
	Insulin-like Growth Factors and Skeletal Muscle Differentiation		$ 101,150 total
10.	Principal Investigator		
	March of Dimes: Basic Research Grant	1997	1999
	Insulin-like Growth Factors and Skeletal Muscle Differentiation		$ 106,396 total
11. R01 DK44181	Principal investigator		
	NIH/NIDDK	1998	2003
	IGFs and Skeletal Muscle Differentiation		$ 659,648 total
12. HOE 9011/4030	Co-Principal Investigator		
	Aventis	2003	2004
	Morning Lantus vs. Intermediate-Acting Insulin in Adolescents with Type1 DM		$ 58,316 total
13.	Principal Investigator		
	Pfizer: Translational Basic Research Award	2003	2004

Prepared: May 26, 2020

IGFs and Skeletal Muscle: Implications for Myotherapy $ 15,000 total

14. Co-Principal Investigator
Thrasher Research Fund 2005 2009
Targeted agents that synergize with radiation in high risk neuroblastoma $ 300,000 total

15. Principal Investigator
Tercica, Inc. 2005 2009
Recombinant Human Insulin-Like Growth Factor-I (rhIGF-I) Treatment of Short Stature Associated with Primary IGF-I Deficiency: A Multicenter, Open-Label, Randomized Concentration Controlled Trial $ 57,000 total

16. Principal Investigator
John A. Kerner, M.D. Foundation: Basic Research Award 2005 2009
Small Molecule Inhibitors of the IGF-I Receptor as a Potential Treatment for Neuroblastoma $ 41,500 total

17. 556830-26226 co-PI
NIH/NIAID 2005 2013
Thymoglobulin for treatment of new onset Type 1 Diabetes

18. Basic Research Award Principal Investigator
ImClone Systems, Inc. 2009 2011
The Therapeutic Potential of A12 Anti-IGF-IR Antibody and Radiation in Neuroblastoma $ 84,000 direct/yr 1

19. 23988-10 co-PI
NIH/NIDDK 2009 2013
UCSF TrialNet

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20. 1R01HD068138-01A1	Site Principal Investigator	5 % effort	Vilain, Sandberg (PI)
NIH/NICHD		09/26/2111	06/30/2016
Disorders of Sex Development: Platform for Basic and Translational Research		$ 639,688 direct/yr 1	$ 3,198,340 total

21.	Principal Investigator	0 (See description, below) % effort	Rosenthal (PI)
NIH/CTSI; Internal Award UCSF		06/01/2018	05/31/2019

Bone Density, Structure, and Estimated Strength in Transgender Youth Receiving Pubertal Suppression in Early Puberty

Minimal data exist on the skeletal effects of puberty suppression in early pubertal transgender youth. This longitudinal cohort study assessed bone mineral density by dual-energy x-ray absorptiometry and bone microarchitecture and strength by high-resolution peripheral quantitative computed tomography, as well as bone turnover markers, body composition, vitamin D status, weight-bearing exercise, and dietary calcium intake. These data will lead to longer-term studies and investigations of interventions to mitigate the expected lag in skeletal development during pubertal suppression. Ultimately, this research should positively contribute to the clinical care of transgender youth. This funding supported the above-noted studies carried out by postdoctoral fellow, Janet Y. Lee, MD, MPH.

Principal Investigator

PEER REVIEWED PUBLICATIONS

1. Rosenthal SM, Reid IA, Kaplan SL, Grumbach MM: Renin substrate depletion in salt-losing congenital virilizing adrenal hyperplasia: low plasma renin activity despite increased renin concentration.. J Pediatr l02:80-82, l983.
2. Rosenthal SM, Grumbach MM, Kaplan SL: Gonadotropin-independent familial sexual precocity with premature Leydig and germinal cell maturation ("familial testotoxicosis"): effects of a potent luteinizing hormone-releasing factor agonist and medroxyprogesterone acetate therapy in four cases. J Clin Endocrinol Metab 57:57l-579, l983.
3. Rosenthal SM, Schriock EA, Kaplan SL, Guillemin R, Grumbach MM: Synthetic human pancreas growth hormone-releasing factor (hpGRF 1-44-NH2) stimulates growth hormone secretion in normal men. J Clin Endocrinol Metab 57:677-679, l983.
4. Schriock EA, Lustig RH, Rosenthal SM, Kaplan SL, Grumbach MM: Effect of growth hormone (GH)-releasing hormone (GRH) on plasma GH in relation to magnitude and duration of GH deficiency in 26 children and adults with isolated GH deficiency or multiple pituitary hormone deficiencies: evidence for hypothalamic GRH deficiency. J Clin Endocrinol Metab 58:l043-l049, l984.

5. Egli CA, Rosenthal SM, Grumbach MM, Montalvo JM, Gondos B: Pituitary gonadotropin-independent male-limited autosomal dominant sexual precocity in nine generations: familial testotoxicosis. J Pediatr 106:33-40, 1985.
6. Gondos B, Egli CA, Rosenthal SM, Grumbach MM: Testicular changes in gonadotropin-independent familial male sexual precocity. Arch Pathol Lab Med 109:990-995, 1985.
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9. Rosenthal SM, Kaplan SL, Grumbach MM: Short-term continuous intravenous infusion of growth hormone (GH) inhibits GH-releasing hormone-induced GH secretion: a time-dependent effect. J Clin Endocrinol Metab 68:1101-1105, 1989.
10. Hartmann K, Papa V, Brown EJ, Rosenthal SM, Goldfine ID: A rapid and simple one-step method for isolation of Poly (A)+ RNA from cells in monolayer. Endocrinology 127:2038-2040, 1990.
11. Rabinovici J, Dandekar P, Angle M, Rosenthal SM, Martin M: Insulin-like growth factor I (IGF-I) levels in follicular fluid from human preovulatory follicles: correlation with serum IGF-I levels. Fertil Steril 54:428-433, 1990.
12. Rosenthal SM, Brunetti A, Brown EJ, Mamula PW, Goldfine ID: Regulation of insulin-like growth factor I (IGF-I) receptor expression during muscle cell differentiation: potential autocrine role of IGF-II. J Clin Invest 87:1212-1219, 1991.
13. Rosenthal SM, Silverman BL, Wehrenberg WB: Exogenous growth hormone (GH) inhibits bovine but not murine pituitary GH secretion in vitro: evidence for a direct effect of GH on the pituitary. Neuroendocrinology 53:597-600, 1991.
14. Rosenthal SM, Brown EJ, Brunetti A, Goldfine ID: Fibroblast growth factor inhibits insulin-like growth factor (IGF)-II gene expression and increases IGF-I receptor expression in BC3H-I myoblasts. Mol Endocrinol 5:678-684, 1991.
15. Papa V, Hartmann K, Rosenthal SM, Maddux BA, Siiteri PK, Goldfine ID: Progestins induce downregulation of insulin-like growth factor I receptors in human breast cancer cells: potential autocrine role of IGF-II. Mol Endocrinol 5:709-717, 1991.
16. Hartmann KKP, Baier TG, Papa V, Kronenwett M, Brown EJ, Goldfine ID, Rosenthal SM: A monoclonal anntibody to the T-cell receptor increases IGF-I receptor content in normal T-lymphocytes: Comparison with phytohemagglutinin. J Cell Biochem 48:81-85, 1992.
17. Brown EJ, Hsiao D, Rosenthal SM: Induction and peak gene expression of insulin-like growth factor II follow that of myogenin during differentiation of BC3H-1 muscle cells. Biochem Biophys Res Commun 183:1084-1089, 1992.
18. Goodman PA, Sbraccia P, Brunetti A, Wong KY, Carter JD, Rosenthal SM, Goldfine ID: Growth factor receptor regulation in the Minn-1 Leprechaun: defects in both insulin receptor and epidermal growth factor receptor gene expression. Metabolism 41:504-509, 1992.

19. Goldfine ID, Papa V, Vigneri R, Siiteri P, Rosenthal SM: Progestin regulation of insulin and insulin-like growth factor I receptors in cultured human breast cancer cells. Breast Cancer Res Treat 22:69-79, 1992.

20. Uyeki T, Barry FL, Rosenthal SM, Mathias RS: Successful treatment with hydrochlorothiazide and amiloride in an infant with congenital nephrogenic diabetes insipidus. Pediatric Nephrology 7:554-556, 1993.

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* Denotes co-first author

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Prepared: May 26, 2020

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SIGNIFICANT PUBLICATIONS

1. Feldman BJ*, Rosenthal SM*, Vargas GA, Fenwick RG, Huang EA, Matsuda-Abedini M, Lustig RH, Mathias RS, Portale AA, Miller WL, Gitelman SE: Nephrogenic syndrome of inappropriate antidiuresis. N Engl J Med 352:34-40, 2005.
   * Denotes co-first author

   I was co-first author on this publication. I recognized that a child, suspected to have a primary renal salt-losing condition, instead had a problem of disordered water balance, and oversaw an evaluation (clinical and laboratory) which ultimately led to the discovery of a novel activating mutation of the V2 vasopressin receptor (V2R) in one of the first of two patients with this previously undescribed disorder. In addition, I co-supervised the data analysis and co-wrote the manuscript.

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   I co-designed the studies, supervised the experiments in my laboratory, oversaw the data analysis, and co-wrote the manuscript.

4. Rosenthal S, Cohen P, Clayton P, Backeljauw P, Bang P, Ten S: Treatment perspectives in Idiopathic Short Stature with a focus on IGF-I deficiency (Guest Editor: Rosenfeld RG). Pediatr Endocrinol Rev Volume 4, Suppl 2: 251-271, 2007

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CONFERENCE ABSTRACTS

1. Note: The following are abstracts from the year 2000 onward:

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3. Adi S, Wu NY, Rosenthal SM: The Role of the MAPK(Erk1/2) Pathway in mediating the switch in IGF-I action from inhibition to stimulation of myogenic differentiation. Sixth Joint Meeting of the European Society for Pediatric Endocrinology and the Lawson Wilkins Pediatric Endocrine Society, Montreal, Canada. 2001.

4. Tiffin N, Rosenthal SM: Upregulation of serum response factor expression by IGF-I is mediated by Erk1/2 phosphorylation in skeletal myoblasts. The Endocrine Society, 2002.

5. Tiffin N, Adi S, Wu NY, Rosenthal SM: Akt phophorylation is insufficient and Erk1/2 dephosphorylation is necessary for IGF-induced myogenesis. First Joint Symposium GH-IGF 2002, Boston, MA, 2002.

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EXHIBIT 4

Exhibit 24

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

B.P.J. by her next friend and mother, HEATHER JACKSON, *Plaintiff*, v. WEST VIRGINIA STATE BOARD OF EDUCATION, HARRISON COUNTY BOARD OF EDUCATION, WEST VIRGINIA SECONDARY SCHOOL ACTIVITIES COMMISSION, W. CLAYTON BURCH in his official capacity as State Superintendent, DORA STUTLER in her official capacity as Harrison County Superintendent, and THE STATE OF WEST VIRGINIA, *Defendants*, and LAINEY ARMISTEAD, *Defendant-Intervenor*.	Civil Action No. 2:21-cv-00316 Hon. Joseph R. Goodwin

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

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

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

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

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

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

PROFESSIONAL BACKGROUND

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

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

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

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

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

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

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

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

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

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

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

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

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

RELEVANT MEDICAL AND SCIENTIFIC BACKGROUND

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

INTERNATIONAL OLYMPIC COMMITTEE POLICIES FOR WOMEN WHO ARE TRANSGENDER

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

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[3] A copy of the 2019 regulations is available at https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi8qbOnsNL0AhUBkIkEHWdpAiQQFnoECAUQAQ&url=https%3A%2F%2Fwww.worldathletics.org%2Fdownload%2Fdownload%3Ffilename%3Dace036ec-a21f-4a4a-9646-fb3c40fe80be.pdf%26urlslug%3DC3.5%2520-%2520Eligibility%2520Regulations%2520Transgender%2520Athletes&usg=AOvVaw1aPuD3gUoz5hcGKgmumVb5

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

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

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

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

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

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

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

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

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

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

NCAA POLICIES FOR WOMEN WHO ARE TRANSGENDER

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

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

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

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

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

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

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

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

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

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

WEST VIRGINIA'S HB 3293

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Executed on January 21, 2022 Joshua D. Safer, MD, FACP, FACE

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EXHIBIT A

CURRICULUM VITAE

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Academic Training

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

Postdoctoral Training

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

Academic Appointments

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

Hospital Appointments

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

Other Medical Staff Appointments

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

Honors:

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

Licensure and Certification

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

Departmental and University Committees

Icahn School of Medicine at Mount Sinai

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

Boston Medical Center

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

Boston University School of Medicine

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

Joshua D. Safer, MD, FACP, FACE

Boston University Goldman School of Dental Medicine

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

Teaching Experience and Responsibilities

Icahn School of Medicine at Mount Sinai

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

Tufts University School of Medicine

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

Boston University School of Medicine

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

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

Boston University Goldman School of Dental Medicine

2002-2018 Course Director, General Medicine and Dental Correlations

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

Major Administrative Responsibilities

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

Other Professional Activities

Professional Societies: Memberships

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

Professional Societies: Offices Held and Committee Assignments

International

World Athletics (formerly IAAF)

2019-present	Drafting Group Member, Transgender Medical Guidelines

International Olympic Committee (IOC)

2017-present	Drafting Group Member, Transgender Medical Guidelines

World Professional Association for Transgender Health (WPATH)

2016-present	Writing Committee Member, Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People
2016-2018	Co-Chair, Scientific Committee, International Meeting, Buenos Aires - 2018
2015-2016	Chair, Scientific Committee, International Meeting, Amsterdam - 2016
2015-present	Task Force Member, Global Education Institute
2015-present	Media Liaison

TransNet – International Consortium for Transgender Medicine and Health Research
2014-present Secretary and Co-Chair, Steering Committee

National

United States Professional Association for Transgender Health (USPATH)
2018-2019 President

Alliance of Academic Internal Medicine
2016-2019 Chair, Compliance Committee
2016-2017 Committee member, Compensation
2015-2016 President, Association of Specialty Professors (ASP)
2014-2017 Council member
2014-2019 Task Force member, Program Planning
2014-2019 Work Group member, Survey Center
2013-2015 Chair, Program Planning Committee, ASP
2012-2017 Council member, ASP
2012-2013 Chair, Membership Services Committee, ASP
2010-2015 Chair, Program Directors Site Visit Training Seminar, ASP
2007-2013 Committee member, Membership Services, ASP

American College of Physicians
2016-2018 Council of Subspecialty Societies member

Endocrine Society
2020-present Transgender Medicine, Special Interest Group member
2017-present Advisory Board member, Transgender/Disorders of Sex Development
2017-2020 Committee member, Clinical Endocrine Education
2014-present Media Liaison for Transgender Medicine
2014-2017 Task Force member, Endocrine Treatment of Transgender Persons Clinical Practice Guideline

American Board of Internal Medicine
2013-2018 Task Force member, Endocrinology Procedures
2013 Task Force member, ASP/AAIM/ACGME/ABIM Joint Next Accreditation System Internal Medicine Subspecialty Milestones

Association of Program Directors in Endocrinology and Metabolism
2017-2018 Secretary-Treasurer
2012-2018 Task Force member, Next Accreditation System Endocrinology Milestones
2011-2012 Task Force member, Procedures Accreditation
2010-2012 Council member
2009-2016 Chair, Site Visit/Curriculum Web-Toolbox Committee

American Thyroid Association
2006-2009 Publications Committee member
2004 Program Committee member

Editorships and Editorial Boards

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

External Medical Advising and Consulting

International

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

National

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

Regional

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

Past Other Support

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

Conferences Organized

International Conferences

World Professional Association for Transgender Health

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

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

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

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

TransNet – International Consortium for Transgender Health and Medicine Research

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

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

June, 2014 Inaugural meeting, Chicago, IL

National Conferences

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

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

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

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

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

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

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

Alliance for Academic Internal Medicine

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

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

May, 2013 2013 ASP Accreditation Seminar "A Changing Landscape in Subspecialty Fellowship Education" Spring Meeting, Lake Buena Vista, FL

April, 2012 2012 ASP Accreditation Seminar "Meeting ACGME and RRC-IM Standards for Successful Fellowship Programs" Spring Meeting, Atlanta, GA

Invited Lectures and Presentations

International

January, 2020 "Transgender Medicine", World Professional Association for Transgender Health Global Education Initiative, Hanoi, Vietnam

September, 2019 "Transgender Women" International Association of Athletics Federations (IAAF), Lausanne, Switzerland

November, 2018 "Transgender Medicine", World Professional Association for Transgender Health Annual Meeting, Buenos Aires, Argentina

October, 2018 "Transgender Medicine", Canadian Endocrine Diabetes Meeting, Halifax, NS, Canada

June, 2018 "21^{s}-Century Strategies: Transgender Hormone Care" CMIN Summit 2018, Porto, Portugal

February, 2017 "A 21st-Century Framework to for Transgender Medical Care" Sheba Hospital, Tel Aviv, Israel

October, 2016 "A 21st-Century Approach to Hormone Treatment of Transgender Individuals" EndoBridge, Antalya, Turkey

May, 2016 "Transgender Women" International Olympic Committee Headquarters, Lausanne, Switzerland

October, 2015 "Workshop on Guidelines for Transgender Health Care" Canadian Professional Association for Transgender Health, Halifax, NS

March, 2015 "Endocrinology - Hormone Induced Changes" Transgender Health Care in Europe, European Professional Association for Transgender Health, Ghent, Belgium

June, 2014 "What to Know to Feel Safe Providing Hormone Therapy for Transgender Patients" International Congress of Endocrinology, Chicago, IL

September, 2011 "Transgender Therapy – The Endocrine Society Guidelines" World Professional Association for Transgender Health, Atlanta, GA

February, 2007 "Treating skin disease by manipulating thyroid hormone action" Grand Rounds, Meier Hospital, Kfar Saba, Israel

March, 2004 "New Directions in Thyroid Hormone Action: Skin and Hair" Grand Rounds, Meier Hospital, Kfar Saba, Israel

National

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

May, 2018 "A 21st-Century Strategy for Hormone Treatment of Transgender Individuals" American Association of Clinical Endocrinologists Annual Meeting, Boston, MA

March, 2018 "21st-Century Strategies for Transgender Hormone Care" New Jersey Chapter - American Association of Clinical Endocrinologists Meeting, Morristown, NJ

February, 2018 "A Strategy for the Medical Care of Transgender Individuals" Keynote Address for the International Society for Clinical Densitometry Annual Meeting, Boston, MA

November, 2017 "A 21st-Century Strategy for Hormone Treatment of Transgender Individuals" National Transgender Health Summit, Oakland, CA

September, 2017 "Transgender Therapy – The Endocrine Society Guidelines" Endocrine Society: Clinical Endocrinology Update, Chicago, IL

May, 2017 "Transgender Medicine – a 21st Century Strategy for Patient Care" University of Arizona College of Medicine, Tucson, AR

April, 2017 "Transgender Care Across the Age Continuum" Annual Meeting of the Endocrine Society, Orlando, FL

March, 2017 "A 21st-Century Approach to Hormone Treatment of Transgender Individuals" Brown University School of Medicine, Providence, RI

March, 2017 "What to Know: A 21st-Century Approach to Transgender Medical Care" United States Food and Drug Administration (FDA), Washington, DC

February, 2017 "A 21st-Century Approach to Transgender Medical Care" United States Professional Association for Transgender Health, Los Angeles, CA

February, 2017 "A 21st-Century Approach to Hormone Treatment of Transgender Individuals" Southern States American Association of Clinical Endocrinologists Annual Meeting, Memphis, TN

December, 2016 "Transgender Medical Care in the United States Armed Forces" Global Education Initiative, World Professional Association for Transgender Health, Arlington, VA

December, 2016 "Foundations in Hormone Treatment" Global Education Initiative, World Professional Association for Transgender Health, Arlington, VA

November, 2016 "Developing a Transgender/Gender-Identity Curriculum for Medical Students" Association of American Medical Colleges National Meeting, Seattle, WA

September, 2016 "A 21st-Century Approach to Hormone Treatment of Transgender Individuals" Endocrine Society: Clinical Endocrinology Update, Seattle, WA

August, 2016 "A 21st-Century Approach to Hormone Treatment of Transgender Individuals" Oregon Health and Science University Ashland Endocrine Conference, Ashland, OR

March, 2016 "State-of-the-Art: Use of Hormones in Transgender Individuals" Annual Meeting of the Endocrine Society, Boston, MA

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

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Regional

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

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March, 2017 "A 21st-Century Strategy for Medical Treatment of Transgender Individuals" Tufts Medicine Grand Rounds, Boston, MA

January, 2017 "What to Know: A 21st-Century Approach to Transgender Medical Care" Internal Medicine Rounds, Brigham and Women's Hospital, Boston, MA

March, 2016 "State-of-the-Art: Hormone Therapy for Transgender Patients" Obstetrics-Gynecology Rounds, Brigham and Women's Hospital, Boston, MA

November, 2015 "What Every Endocrinologist Should Know to Feel Safe Providing Hormone Therapy for Transgender Patients" Endocrinology Rounds, Tufts Medical Center, Boston, MA

May, 2015 "What Every Endocrinologist Should Know to Feel Safe Providing Hormone Therapy for Transgender Patients" Endocrinology Rounds, Massachusetts General Hospital, Boston, MA

December, 2014 "What to Know to Feel Safe Providing Hormone Therapy for Transgender Patients" Endocrinology Rounds, Beth Israel Deaconess Medical Center, Boston, MA

November, 2013 "Transgender Therapy – What Every Physician Should Know" Medicine Grand Rounds, Boston Veterans Administration Hospital, Boston, MA

May, 2005 "Transgender Therapy: The Role of the Endocrinologist", Endocrinology Rounds, Tufts-New England Medical Center, Boston, MA

January, 2004 "New Directions in Thyroid Hormone Action: Skin and Hair", Endocrinology Rounds, Brigham and Women's Hospital, Boston, MA

October, 1999 "The Many Faces of Hypothyroidism", Medicine Grand Rounds, Bedford Veterans Administration Hospital, Bedford, MA

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

October, 2019 "Transgender Medicine", East Harlem HOP rounds, New York, NY

October, 2019 "Transgender Medicine", Mount Sinai HIV rounds, New York, NY

August, 2019 "Transgender Medicine", Mount Sinai Endocrinology Fellows Conference, New York, NY

February, 2019 "Transgender Medicine", Mount Sinai Endocrinology Grand Rounds, New York, NY

February, 2019 "Transgender Medicine", Mount Sinai Ob-Gyn Grand Rounds, New York, NY

April, 2018 "21st-Century Strategies for Transgender Hormone Care", HIV Grand Rounds

Institutional, Boston University School of Medicine, Boston, MA

March, 2017 "State of the Art Hormone Therapy for Transgender Patients", Section of Infectious Disease

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

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Curriculum development with external dissemination

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

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

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

Curriculum adopted

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

Curriculum in development

Dartmouth School of Medicine
University of Vermont College of Medicine

Work in progress in preparation for sharing transgender curriculum

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

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

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

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

Other curriculum development

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

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

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

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

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

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

Bibliography: (ORCID # 0000 0003 2497 8401)

Names of mentees are underlined throughout the bibliography section

** currently most influential papers are noted with double asterisks

Original, Peer-Reviewed Articles

1. **Safer JD**, Langlois MF, Cohen R, Monden T, John-Hope D, Madura J, Hollenberg AN, Wondisford FE. Isoform variable action among thyroid hormone receptor mutants provides insight into pituitary resistance to thyroid hormone. *Mol Endocrinol* 1997;11(1):16-26. PMID 8994184

2. Langlois MF, Zanger K, Monden T, **Safer JD**, Hollenberg AN, Wondisford FE. A unique role of the beta-2 thyroid hormone receptor isoform in negative regulation by thyroid hormone - mapping of a novel amino-terminal domain important for ligand-independent activation. *J Biol Chem* 1997;272(40):24927-24933. PMID 9312095

3. **Safer JD**, Cohen RN, Hollenberg AN, Wondisford, FE. Defective release of corepressor by hinge mutants of the thyroid hormone receptor found in patients with resistance to thyroid hormone. *J Biol Chem* 1998;273(46):30175-30182. PMID 9804773

4. **Safer JD**, O'Connor MG, Colan SD, Srinivasan S, Tollin SR, Wondisford FE. The TR-beta gene mutation R383H is associated with isolated central resistance to thyroid hormone. *J Clin Endocrinol Metab* 1999;84(9):3099-3109. PMID 10487671

5. **Safer JD**, Fraser LM, Ray S, Holick MF. Topically applied triiodothyronine stimulates epidermal proliferation, dermal thickening, and hair growth in mice and rats. *Thyroid* 2001;1(8):717-724. PMID 11525263

6. Tangpricha V, Chen BJ, Swan NC, Sweeney AT, de las Morenas A, **Safer JD**. Twenty-one gauge needles provide more cellular samples than twenty-five gauge needles in fine needle aspiration biopsy of the thyroid. *Thyroid* 2001;11(10):973-976. PMID 11716046

7. **Safer JD**, Crawford TM, Fraser LM, Hoa M, Ray S, Chen TC, Persons K, Holick MF. Thyroid hormone action on skin: diverging effects of topical versus intraperitoneal administration. *Thyroid* 2003;13(2):159-165. PMID 12699590

8. Santini F, Ceccarini G, Montanelli L, Rosellini V, Mammoli C, Macchia P, Gatti G, Pucci E, Marsili A, Chopra IJ, Chiovato L, Vitto P, **Safer JD**, Braverman LE, Martino E, Pinchera A. Role for inner ring deiodination preventing transcutaneous passage of thyroxine. *J Clin Endocrinol Metab* 2003;88(6):2825-2830. PMID 12788895

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10. **Safer JD**, Crawford TM, Holick MF. Topical thyroid hormone accelerates wound healing in mice. *Endocrinology* 2005;146(10):4425-4430. PMID 15976059

11. Saha AK, Persons K, **Safer JD**, Luo Z, Holick MF, Ruderman NB. AMPK regulation of the growth of cultured human keratinocytes. *Biochem Biophys Res Co* 2006;349(2):519-24. PMID 16949049

12. **Safer JD**, Ray S, Holick MF. A topical PTH/PTHrP receptor antagonist stimulates hair growth in mice. *Endocrinology* 2007;148(3):1167-1170. PMID 17170098

13. **Safer JD**, Persons K, Holick MF. A thyroid hormone deiodinase inhibitor can decrease cutaneous cell proliferation in vitro. *Thyroid* 2009;19(2):181-185. PMID 19191748

14. Ariza MA, Loken WM, Pearce EN, **Safer JD**. Male sex, African-American race/ethnicity, and T3 levels at diagnosis are predictors of weight gain following medication and radioactive iodine treatment for hyperthyroidism. *Endocr Pract* 2010;16(4):609-616. PMID 20350916

15. Abraham TM, de las Morenas A, Lee SL, **Safer JD**. In thyroid fine needle aspiration, use of bedside-prepared slides significantly increased diagnostic adequacy and specimen cellularity relative to solution-based samples. *Thyroid* 2011;21(3):237-242. PMID 21323589

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18**. **Safer JD**, Pearce EN. A simple curriculum content change increased medical student comfort with transgender medicine. *Endocr Pract* 2013;19(4):633-637. PMID 23425656
- First ever demonstration of the effectiveness of an evidence-based approach to teaching transgender medicine to medical students

19. Thomas DD, **Safer JD**. A simple intervention raised resident-physician willingness to assist transgender patients seeking hormone therapy. *Endocr Pract* 2015;21(10):1134-42. PMID 26151424

20. Mundluru SN, **Safer JD**, Larson, AR. Unforeseen ethical challenges for isotretinoin treatment in transgender patients. *Int J of Womens Dermatol* 2016;2(2):46-48. PMID 28492004

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Critical Reviews, Editorials, Chapters, Case Reports:

Editorials and Critical Reviews:

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

"Gender Revolution with Katie Couric" National Geographic Channel. Couric, Katie. February 6, 2017.
Extended interview with Katie Couric threaded into a 2-hour television special. Trailer:
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"Is gender identity biologically hard-wired?" Judd, Jackie. PBS NewsHour. May 13, 2015.
Extended interview for Jackie Judd http://www.pbs.org/newshour/bb/biology-gender-identity-children/
estimated just over 1,000,000 viewers per Nielsen

Innovation	Significance/impact
Development and leadership of the Transgender Medicine Clinical Center, Mount Sinai Health System and Icahn School of Medicine at Mount Sinai	• The Center for Transgender Medicine and Surgery at Mount Sinai is the first comprehensive center for transgender medical care in New York and the most comprehensive program in the United States • The Center is one of only several such centers in North America that are housed in academic teaching hospitals where care can be integrated • The Center is a model for such care delivery in North America.
Establishment, development, and leadership of the Transgender Medicine Clinical Center at Boston Medical Center	• The Center for Transgender Medicine and Surgery at BMC is the first comprehensive center for transgender medical care in New England • The Center is one of only several such centers in North America that are housed in academic teaching hospitals where care can be integrated • The Center is a model for such care delivery in North America.
Development and dissemination of the seminal reviews that are most widely cited in the lay press that explain the concept that gender identity is a biological phenomenon (see bibliography section above, e.g. PMID: 25667367).	• The concept that gender identity is a biological phenomenon has been a key component of the recent culture change in favor of mainstream medical care for transgender individuals (see media section above)
Development and dissemination of new and influential curricular content to teach the biology of gender identity in conventional medical education (see curriculum section above)	The teaching of evidence-based approaches to transgender medical care to: • Medical students (see bibliography section above, e.g. PMID 23425656 and PMID 27042742) • Physician trainees (see bibliography section above, e.g. PMID 26151424) • Practicing physicians (see invited lectures section above) serves as a crucial component to the gained credence given to care for transgender individuals in conventional medical settings.
Development and dissemination of seminal reviews supporting the safety of transgender hormone treatment regimens (see invited lectures section above)	• Once mainstream medical providers learn of the biology underlying gender identity, their biggest concern is the relative safety of the medical interventions relative to the benefit. • The development and dissemination of the seminal reviews and lectures supporting the safety of current treatment regimens serves as a further crucial component to the culture change among conventional medical providers in favor of routine medical care for transgender individuals

EXHIBIT 5

Exhibit 5 – Side-by-Side Comparisons of Dr. Shumer's Report (Ex. 2) and Reports by Dr. Rosenthal (Ex. 3) and Dr. Safer (Ex. 4)

Dr. Rosenthal's April 19, 2022 Declaration (publicly filed April 21, 2022) (Ex. 3)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
¶ 22: Any **attempts to "cure" transgender individuals by forcing their gender identity into alignment with their assigned sex are harmful,** dangerous, **and ineffective**. **Those practices have been denounced as unethical by all major professional associations of medical and mental health professionals, such as** WPATH, **the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association**.	¶ 23: **Attempts to "cure" transgender individuals by forcing their gender identity into alignment with their birth sex are harmful and ineffective. Those practices have been** widely **denounced as unethical by all major professional associations of medical and mental health professionals, such as the American Medical Association, the American Academy of Pediatrics, the American Psychiatric Association, and the American Psychological Association**, among others.
¶ 18: **At birth**, newborns are **assigned** a **sex**, either **male or female**, typically **based** solely **on the appearance of their external genitalia**. **For most people, that assignment turns out to be accurate** and their **assigned sex matches** that **person's gender identity**. However, **for transgender people**, **their assigned sex does not align with** their **gender identity**.	¶ 25: **When a child is born**, a healthcare provider **designates** the child's **sex** as **male or female based on the child's observable anatomy**. **For most people, that initial designation** (often referred to as "**assigned sex**") **turns out to be consistent** with the **person's gender identity**. **For a transgender person**, however, **that initial designation** turns out to be inaccurate because it **does not reflect** the person's **gender identity**.
¶ 24: **Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of** "**gender dysphoria,**" **a serious condition** listed **in** both **the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ("DSM-5") and the World Health Organization's International Classification of Diseases ("ICD-10"),** and has been **recognized** as such for decades.	¶ 26: **Due to the incongruence between their assigned sex and gender identity, transgender people experience varying degrees of gender dysphoria, a serious medical condition recognized in** the **American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders ("DSM-5**-TR") **and the World Health Organization's International Classification of Diseases ("ICD-10"),** where it is referred to as "gender incongruence."
¶ 26**: Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression, self-harm, and suicidality.** Spack NP, Edwards-Leeper L, Feldmain HA, et al. Children and adolescents	¶ 26: **Gender dysphoria is highly treatable and can be effectively managed. If left untreated, however, it can result in severe anxiety and depression,** eating disorders, substance abuse, **self-harm, and suicidality**.

Dr. Rosenthal's April 19, 2022 Declaration (publicly filed April 21, 2022) (Ex. 3)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
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¶ 23: For more than four decades, **the goal of medical treatment for transgender patients has been to alleviate their distress by bringing their lives into closer alignment with their gender identity**. The specific treatments prescribed are based on individualized assessment conducted by medical providers in consultation with the patient's treating mental health provider. As discussed in more detail in the following section, and in the declaration of Dr. Hawkins, **research and clinical experience have consistently shown those treatments to be safe, effective,** and critical to the health and well-being of transgender patients.	¶ 28: **The goal of medical treatment for transgender patients is to alleviate their distress by allowing them to live consistently with their gender identity**. **Research and clinical experience have consistently shown the medical treatments** for gender dysphoria **to be safe** and **effective**.
¶ 27: **The prevailing standards of care for the treatment of gender dysphoria are developed by WPATH**, which has been recognized as the standard-setting organization for the treatment of gender dysphoria for more than forty years.	¶ 29: **The prevailing standards of care for the treatment of gender dysphoria are developed by WPATH**.
¶ 29: As a result, **the SOC** and the Endocrine Society's clinical practice guidelines **reflect the consensus of experts in the field of transgender medicine**, **based on the best** available **science and clinical experience**.	¶ 29: **The WPATH Standards of Care represent expert consensus for clinicians related to medical care for transgender people**, **based on the best science and clinical experience**.
¶ 30: **The major professional associations of medical and mental health providers in the United States, including the American Medical Association, American Academy of Pediatrics, American Psychiatric Association, American Psychological Association, and Pediatric Endocrine Society, treat those documents as the prevailing standards guiding the healthcare and treatment of gender dysphoria**.	¶ 29: **These standards have been endorsed by the major professional associations of medical and mental health providers in the United States, including the American Medical Association,** the **American Academy of Pediatrics,** the **American Psychiatric Association,** the **American Psychological Association, and** the **Pediatric Endocrine Society**.

Dr. Rosenthal's April 19, 2022 Declaration (publicly filed April 21, 2022) (Ex. 3)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
¶ 28: **The Endocrine Society is a 100-year-old global membership organization representing professionals in the field of adult and pediatric endocrinology. In 2017, the Endocrine Society published** its second **clinical practice guidelines on treatment recommendations for the medical management of gender dysphoria, in collaboration with Pediatric Endocrine Society, the European Societies for Endocrinology and Pediatric Endocrinology, and WPATH, among others**. Hembree WC, Rosenthal SM, et al. Endocrine Treatment of Gender Dysphoria/Gender Incongruent Persons: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* 2017; 102: 3869–3903.	¶ 30: **The Endocrine Society is a 100-year-old global membership organization representing professionals in the field of adult and pediatric endocrinology. In 2017, the Endocrine Society published clinical practice guidelines on treatment recommendations for the medical management of gender dysphoria, in collaboration with the Pediatric Endocrine Society, the European Societies for Endocrinology and Pediatric Endocrinology, and WPATH, among others**.
¶ 29: **Together, the SOC and the Endocrine Society's clinical practice guidelines constitute the prevailing standards guiding the healthcare and treatment of gender dysphoria**.	¶ 31: **Together, the WPATH Standards of Care and the Endocrine Society's clinical practice guidelines establish the prevailing standards governing the healthcare and treatment of gender dysphoria** in both youth and adults.
¶ 32: **Undergoing treatment to alleviate gender dysphoria is commonly referred to as** a **transition**. **The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical transition, including puberty-delaying medication and hormone-replacement therapy**; **and (iii)** surgical transition, including **surgeries to alter the appearance and functioning** of **primary- and secondary-sex characteristics**.	¶ 32: **Undergoing treatment to alleviate gender dysphoria is commonly referred to as transition**. **The transition process typically includes one or more of the following three components: (i) social transition, including adopting a new name, pronouns, appearance, and clothing, and correcting identity documents; (ii) medical transition, including puberty-suppressing medication** (also sometimes referred to as puberty-blocking medication) **and hormone-replacement therapy**; **and (iii)** for adults, **surgeries to alter the appearance and functioning primary- and secondary-sex characteristics**. Surgery is rarely indicated for transgender minors.
¶ 36: Those medications work by temporarily pausing endogenous puberty and, therefore, limiting the influence of a person's endogenous sex hormones on their body. **For**	¶ 33: At the onset of puberty, **adolescents** diagnosed with gender dysphoria may be prescribed puberty-suppressing medications (gonadotrophin-releasing hormone agonists or

Dr. Rosenthal's April 19, 2022 Declaration (publicly filed April 21, 2022) (Ex. 3)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
example, a transgender girl (someone designated male at birth with a female gender identity) **will experience no progression of physical changes caused by testosterone, including facial and body hair, an Adam's apple,** a deepened voice, **or masculinized facial structures**. **And in a transgender boy** (someone designated female at birth with a male gender identity), **those medications would prevent** progression of **breast development, menstruation, and widening of the hips**. This **prevents** a transgender **adolescent** from experiencing **the** severe psychological **distress of developing** permanent, unwanted **physical characteristics that do not align with the adolescent's gender identity**.	GnRHa) to **prevent the distress of developing physical characteristics that conflict with the adolescent's gender identity**. **For example, a transgender girl will experience no progression of physical changes caused by testosterone, including** male muscular development, **facial and body hair, an Adam's apple, or masculinized facial structures**. **And in a transgender boy, puberty-suppressing medication will prevent breast development, menstruation, and widening of the hips**.
¶ 39: For many transgender youth, it is medically necessary for them to begin **hormone-replacement therapy** with either testosterone or estrogen. That treatment **induces the** physical changes of the **puberty associated with the patient's gender identity**. **The result of this treatment is that a transgender boy has the same typical levels of circulating testosterone as his nontransgender male peers**. **Similarly, a transgender girl will have the same typical levels of circulating estrogen as her nontransgender female peers**.	¶ 34: Thereafter, the treating provider may prescribe cross-sex hormones to **induce the puberty associated with the adolescent's gender identity**. This treatment is referred to as **hormone therapy**. **The result of this treatment is that a transgender boy typically has the same levels of circulating testosterone as other boys**. **Similarly, a transgender girl** who receives hormone therapy **will typically have the same levels of circulating estrogen** and testosterone levels **as other girls** and significantly lower than boys who have begun pubertal development.

Dr. Safer's January 21, 2022 Report and Declaration (publicly filed April 21, 2022) (Ex. 4)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
¶ 17: **"Gender identity" is the medical term for a person's internal, innate sense of belonging to a particular sex.** *See* Endocrine Society Guidelines, Tbl.1 *and* Safer JD, Tangpricha V. Care of transgender persons. *N Engl J Med* 2019; 381:2451–2460, Tbl.1.	¶ 16: **"Gender identity" is the medical term for a person's internal, innate sense of belonging to a particular sex.** Everyone has a gender identity.
¶ 18: **A person's gender identity is durable and cannot be changed by medical intervention**.	¶ 21: **A person's gender identity is innate and cannot be changed**, including **by medical** or psychological **intervention**.

Dr. Safer's January 21, 2022 Report and Declaration (publicly filed April 21, 2022) (Ex. 4)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
¶ 19: **The terms "gender identity," "gender roles,"** and "gender expression" **refer to different things.**	¶ 18: **The terms "gender role" and "gender identity" refer to different things.**
¶ 20: **Gender roles are behaviors, attitudes, and personality traits that a society (in a given culture and historical period) designates** as **masculine or feminine** and/**or** that society **associates with** or considers typical of the **social role** of **men or women**. *See* Endocrine Society Guidelines Tbl.1. **The convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are** examples of **socially constructed gender roles from a particular culture and historical period.**	¶ 19: **Gender roles are behaviors, attitudes, and personality traits that a particular society considers masculine or feminine, or associates with male or female social roles**. For example, **the convention that girls wear pink and have longer hair, or that boys wear blue and have shorter hair, are socially constructed gender roles from a particular culture and historical period.**
¶ 21**: By contrast,** "**gender identity**" **does not refer to** a set of **socially contingent behaviors, attitudes, or personality traits** that a society designates as masculine or feminine. It **is an internal and** largely **biological phenomenon**.	¶ 20: **By contrast, gender identity is an internal and biologically** influenced **phenomenon**. It **does not refer to socially contingent behaviors, attitudes, or personality traits.**
¶ 23: **A person's sex encompasses** the sum of **several different biological attributes, including** sex **chromosomes**, certain genes, gonads, **sex hormone levels**, internal and **external genitalia**, other **secondary sex characteristics**, and **gender identity**.	¶ 24: From a medical perspective, **a person's sex is comprised of several components, including**, among others, internal reproductive organs, **external genitalia, chromosomes, hormones, gender identity**, and **secondary-sex characteristics**.
¶ 25: **Before puberty**, age-grade competitive sports records **show minimal or no differences** in athletic **performance** between **non-transgender boys and non-transgender girls** before puberty. **But after puberty, non-transgender boys and men as a group** have **better average performance outcomes** in most athletic competitions when compared to **non-transgender girls and women as a group**.	¶ 36: **Before puberty, girls and boys** generally **perform** at **the same level with some small differences at the margins** (some favoring boys, some favoring girls). In contrast, **post-pubertal boys as a group** generally begin to show a **significant athletic advantage over post-pubertal girls** due to their exposure over time to the elevated levels of testosterone associated with male puberty.
¶ 25: Based on current research comparing non-transgender boys and men with non-transgender girls and women before, during, and after puberty, **the** primary known **biological driver of these average group differences is testosterone** starting at	¶ 37. **The biological driver of these average group differences is testosterone, not anatomy or genetics**.

Dr. Safer's January 21, 2022 Report and Declaration (publicly filed April 21, 2022) (Ex. 4)	Dr. Shumer's October 10, 2024 Report (Ex. 2)
puberty, and **not reproductive biology or genetics**.	
¶ 49: **By** excluding girls who are transgender based on "**biological sex**," and defining that term **to mean** "**reproductive biology and genetics at birth**," **West Virginia** categorically **prevents girls who are transgender from participating on girls' teams** regardless of whether they are pre-pubertal, receiving puberty blockers, or receiving gender-affirming hormone therapy. **But** based on current research, **the** primary known **biological cause of average differences in athletic performance between nontransgender men as a group and non-transgender women as a group is circulating testosterone—not "reproductive biology and genetics at birth." A person's genetic makeup and** internal and external reproductive **anatomy are not useful indicators of athletic performance** and have not been used in elite competition for decades.	¶ 47: **By** suggesting sex **to mean** only **biological sex determined at fertilization and revealed in utero or at birth**, **Arizona prevents Plaintiffs from participating on girls' teams** because they are transgender girls. **But the biological driver of average differences in athletic performance between men and women is circulating testosterone—not a person's transgender status or their biological sex determined at fertilization and revealed in utero or at birth**. **A person's genetic makeup and anatomy** at birth alone **are not reliable indicators of athletic performance**.

EXHIBIT 6

SPG U-M Standard Practice Guide

UNIVERSITY OF MICHIGAN

Procedures for Investigating Allegations of Misconduct in the Pursuit of Scholarship and Research under SPG 303.03

A. Applicability of the Procedures

This document sets forth the implementing procedures to the Policy Statement on the Integrity of Scholarship and Research (SPG 303.03). These procedures apply to allegations of research misconduct and other serious deviations from accepted research practices when the respondent is one of the following individuals:

1. All instructional faculty (tenure track and clinical track), research faculty, librarians, and other University staff members, including without limitation: graduate student research assistants, graduate student teaching assistants, graduate student staff assistants, postdoctoral fellows and postdoctoral research associates, house officers, visiting faculty and students or staff, sponsored affiliates, temporary staff or student employees, faculty or staff on sabbatical leave, adjunct faculty and emeritus faculty when performing University work, faculty or staff on leave without pay, paid and unpaid interns, and all other members of the University of Michigan's academic community;

2. Undergraduate students engaged in research or other scholarly activity. In cases in which the alleged misconduct relates to a student's coursework or other academic activities, the applicable school or college procedure for handling allegations of academic misconduct by students will apply. In cases in which the status of a student respondent is unclear, the responsible administrator will elect whether to employ these procedures or other procedures available for the investigation and adjudication of alleged academic misconduct by students; and

3. Former University students or employees, if the alleged misconduct occurred during the period of attendance or employment at the University.

B. Definition of Research Misconduct. Research Misconduct is defined as *fabrication*, *falsification*, and *plagiarism*.

1. *Fabrication*: making up data or results and recording them in the research record.

2. *Falsification*: manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

3. *Plagiarism*: the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

C. Other Violations of Research Integrity. In addition, the University of Michigan may apply these procedures to other serious deviations from accepted research practices, including but not limited to the following:

1. *Abuse of confidentiality*: taking or releasing the ideas or data of others by one with whom they were shared with the legitimate expectation of confidentiality (e.g., stealing ideas from others' grant proposals, award applications, or manuscripts for publication when one is a reviewer for granting agencies or journals, or is an internal reviewer);

2. *Dishonesty in publication*: knowingly publishing material that will mislead readers (e.g., misrepresenting data, misrepresenting research progress; or adding the names of other authors without permission);

3. *Property violations*: stealing, tampering with, or destroying property of others, such as research papers, supplies, equipment, or products of research or scholarship;

4. *Failure to report observed research misconduct*: covering up or otherwise failing to report observed, suspected, or apparent research misconduct by others;

5. *Retaliation*: taking punitive action against an individual for having reported alleged research misconduct;

6. Directing or encouraging others to engage in any of the above listed offenses.

D. Responsibilities of the Research Integrity Officer (RIO)

The RIO is appointed by the Vice President for Research and has the primary responsibility for overseeing the procedures described in this document. The RIO assesses allegations to ascertain whether they could, if true, constitute research misconduct under SPG 303.03; determines when the allegations warrant further inquiry; oversees inquiries; and oversees the activities of any investigation committees to ensure compliance with SPG 303.03 and the appropriate federal policies, if applicable. The RIO is also responsible for making timely reports to the relevant external agencies, as required, and for appropriately maintaining documentation of all research misconduct proceedings.

E. Considerations

1. **Confidentiality**
   Because of the potential jeopardy to the reputation and rights of a respondent, great care will be taken to handle reporting, preliminary assessments, inquiries, and investigations in a way that preserves confidentiality, and to provide information only to those with a need to know, which includes those within the University who need the information to perform their University roles. The procedures used are intended to safeguard the rights of the respondent and the complainant, if a complainant is identified, and to recognize the interest of the University's academic community in research integrity. The University will protect, to the best of its ability, the privacy of those who, in good faith, report allegations of research misconduct, as well as of those who are the subjects of such allegations. The University will also provide, to the best of its ability, an expeditious and thorough review of the allegation, and will provide the respondent the opportunity to comment, as appropriate, during the review process.

2. **External Notifications**
   Despite the University's general commitment to preserving confidentiality noted above, there may be cases in which the University may need – at any stage of the process, including before the University's review has concluded – to notify and/or consult with external entities about the allegation or aspects thereof. In any cases involving potential external notification, the Vice President for Research, in consultation with the Office of the General Counsel, will decide if and when a notification should occur, what any such notification will include, and to whom it should be directed.

3. **Interim Measures**
   In some cases, it may be necessary to take interim measures pending final resolution of the research misconduct allegation. These interim measures could include actions to protect human subjects or to preserve federal or other sponsor funds (including suspension of the research at issue), or other appropriate steps. In such cases, the appropriate University official, in consultation with the Office of the General Counsel, will determine whether interim measures are needed and what measures are appropriate under the circumstances.

4. **Conflict of Interest**
   The integrity of the process will be maintained by disclosure and evaluation of any prejudicial conflict of interest. Individuals judged by the appropriate University official to have a conflict of interest that would jeopardize the credibility of the inquiry or investigation will not be assigned decision-making roles in the process.

5. **Access to Research Records**
   In accordance with University policies and Standard Practice Guides, during its review of an allegation of research misconduct and other allegations regarding the conduct of research and scholarship, as described above, the University may access and take custody of all records, whether physical or electronic, that are generated in the course of the research or scholarship and that may be relevant to its review of the allegation, regardless of where the records are stored.

6. **Modifications to Procedures**
   In appropriate cases, including those in which the respondent admits responsibility, the RIO in consultation with the appropriate University officials and, if needed, federal oversight agencies may consider whether to modify or eliminate any of the procedural stages of the procedures set forth below.

F. Review of Reported Allegations and Sequestration of Evidence

The review of allegations may have three sequential stages: (1) preliminary assessment to assess whether the allegation meets the University of Michigan's definition of research misconduct, as set forth in SPG 303.03; (2) an inquiry to determine whether the allegation warrants further formal investigation; and (3) when warranted, a formal investigation to thoroughly examine and evaluate all relevant facts to assess the validity of the allegation. Generally, the RIO will oversee the review process to ensure that these procedures are followed in a manner that is fair and unbiased. In cases in which the respondent is a faculty member, the Office of the Vice President for Research will consult with the Office of the Provost to determine whether and how that office would like to be involved in the review of the research misconduct allegation.

Initial sequestration of evidence may occur at any time after allegations are received. The RIO will take all reasonable and practicable steps to obtain custody of relevant research records and evidence, as soon as feasible, and store them in a secure manner in accordance with the University policies outlined in Section III.A of the Standard Practice Guide 601.11. All data and records that could be relevant to the University's review of the allegation will be sequestered by the RIO. Sufficiently detailed documentation will be kept to permit later assessment of the adequacy of the process by the RIO. (This is particularly important in those instances in which the Vice President for Research determines that a formal investigation is not warranted). The documentation will be kept in a secure manner.

Different academic disciplines may have different forms of research records, both physical and electronic. Examples of research records include, but are not limited to, the following: research proposals; laboratory records, both physical and electronic, including lab notebooks; progress reports; theses; abstracts; oral presentations; internal reports; manuscripts and publications; notes; correspondence including emails; videos; biological materials; equipment use logs; laboratory procurement records; certifications; and records related to the planning, conduct, management, and reporting of human or animal subject research.

1. **Preliminary Assessment**
   Upon receipt of a research misconduct allegation, the RIO will assess the allegation to determine whether, if taken as true, it falls within the University of Michigan's definition of research misconduct, such that the policy stated in Standard Practice Guide 303.03 applies. If so, (s)he may continue to the next step in the process, which is an inquiry. Situations that are determined by the RIO not to involve research misconduct may be referred to other administrative channels, as appropriate.

2. **Inquiry**
   a. Purpose
      An inquiry is information-gathering and initial fact-finding to determine whether the allegation or apparent instance of misconduct has substance and warrants a formal investigation. It is intended to separate serious allegations deserving further formal investigation through this process from trivial, frivolous, unjustified, or clearly mistaken allegations.

   b. Notification to Respondent
      Upon initiation of an inquiry, the respondent will be informed of the allegation(s) and given an opportunity to respond to them.

   c. Inquiry Process
      The RIO may conduct the inquiry or may assign an individual or individuals without conflict of interest to conduct the inquiry. In rare cases, if relevant expertise is lacking within the University, the RIO may seek the assistance of an external expert. The RIO will consult with the Office of the General Counsel prior to consulting with an external expert. Typically, the inquiry will include gathering and review of relevant information and may include interviews with the complainant(s), respondent(s), and other witnesses, as deemed appropriate.

   d. Inquiry Report
      The individual(s) appointed to conduct the inquiry will prepare a written report. The report will include a statement of the allegation; a description of the evidence reviewed; summaries of the relevant interviews, if any; and the conclusions of the inquiry regarding whether there is sufficient evidence to warrant a formal investigation.

e. Inquiry Report Review and Actions

If the inquiry recommends that a formal investigation be pursued, the respondent will be provided the opportunity to comment on the inquiry report and any such comment will become part of the record. If the report of the inquiry recommends that a formal investigation is not warranted, then no comments will be sought.

The report of the inquiry, along with any written comments on the report received from the respondent, will be forwarded to the Vice President for Research.

If the Vice President for Research concurs that an investigation is warranted, (s)he will decide whether additional notification (e.g., to the appropriate Dean or Director), if any, is necessary, and the RIO will convene the research misconduct investigation.

If the inquiry will not proceed to a formal investigation, the RIO will inform any persons involved in the inquiry to whom the identity of the respondent was disclosed by the University that the inquiry did not produce sufficient evidence to warrant formal investigation.

3. **Investigation**

a. Purpose

An investigation is the formal examination and evaluation of all relevant facts by a committee of knowledgeable faculty or, as needed, other individuals to determine if the preponderance of evidence supports the conclusion that research misconduct has taken place.

b. Selection of the Investigation Committee

Upon determining that a formal investigation is warranted, the RIO will appoint an investigation committee, the composition and size of which will be determined by the RIO. The appointed committee must have the necessary and appropriate expertise to carry out a thorough, formal investigation and authoritative evaluation of the relevant evidence. The committee members must not have any personal, professional, or financial conflicts of interest with either the respondent, the complainant, or witnesses. The investigation committee should include at least one faculty member who is an expert in the field of research that gave rise to the allegation and may, if necessary, also include one or more such experts from outside the University. The RIO will consult with the Office of the General Counsel prior to consulting with an external expert.

c. Notification to Respondent

The RIO will inform the respondent of the initiation of the formal investigation, the composition of the investigation committee, and the charge to that committee. If the respondent has concerns that any committee member has a conflict of interest, the respondent can identify the basis for those concerns to the RIO, who will review and determine whether a conflict exists such that one or more alternative committee members should be appointed.

d. Charge to the Investigation Committee

The Vice President for Research will provide the charge to the investigation committee, which will include: (1) the purpose of the formal investigation, (2) copies of the allegations and the inquiry report, (3) responsibilities of the investigation committee, as set forth below, (4) the requirements needed to support a finding of research misconduct, and (5) the expected timeframe for formal investigation (consistent with applicable regulatory requirements, if any). The committee will also be provided with a copy of SPG 303.03 and its associated procedures.

e. Responsibilities of the Investigation Committee

The Committee will gather evidence and promptly reach a determination of whether research misconduct has occurred. The investigation will be completed within 120 days of the initial meeting of the committee, unless additional time is required. The committee's determination of research misconduct may also include recommended sanctions (e.g., reprimand, demotion, or discharge) or other actions appropriate for resolution of the matter.

During the formal investigation, every reasonable effort will be made to protect the confidentiality of the respondent(s), the complainant(s), and any witnesses, as set forth in Section E.1. However, at this stage, the respondent will normally be entitled to know the identity of all witnesses, if any, who will be called by the investigation committee. Cases that depend solely upon the observations or statements of the complainant may be unable to proceed without the involvement of that individual, or the ability to review may be severely limited;

other cases that can rely on documentary evidence may permit the complainant to remain uninvolved without compromising the investigation.

f. Rights of the Respondent at Respondent's Interview
When the respondent is interviewed by the committee, the respondent may be accompanied by an advisor, who may be an attorney. The advisor's role (whether an attorney or not) will be limited to advising the respondent. The advisor may not address the committee or any witnesses. If counsel is present with the respondent, the Office of the General Counsel will likewise be asked to be present at the meeting, for the limited purpose of advising the RIO and the investigation committee.

The investigation committee will keep the respondent and the Vice President for Research apprised of any additional allegations or other significant developments during the formal investigation, particularly if those developments might support expansion of the committee's investigative charge.

g. Interviews
The investigation may include interviews, which will be recorded or transcribed. Recordings or, if available, transcripts, will be provided to the interviewed party for comment and will be included, along with any comments received, as part of the formal investigation file. Only the interviewed party, and any advisor (who will be subject to the same strictures set forth in f, above), will be present at the interview with the committee.

h. The Investigation Report
The investigation committee will prepare a written report that summarizes its conclusion regarding whether misconduct occurred and that may recommend sanctions or remediation, as appropriate. The report must describe: the identity of the respondent; the nature of the allegation(s); the specific allegations; funding source(s); methods used to examine the evidence; a list of evidence reviewed; a statement of findings for each allegation specifying whether research misconduct occurred and whether it was committed intentionally, knowingly, or recklessly; the identity of the responsible individual for each finding of research misconduct; any publications that need correction or retraction; any federally funded projects that may have been impacted by the misconduct; any sanctions or remediation that the committee recommends; and comments on the draft investigation report by the respondent.

i. Review of the Investigation Report and Actions
The respondent will be afforded the opportunity to provide written comments on the report. The comments of the respondent on the draft report, if any, must be submitted within 30 days of the date on which the respondent received the draft and such comments will become part of the record.

The investigation committee will submit its report, along with the complete investigatory file, to the Vice President for Research. The Vice President for Research will take the following steps, in consultation with the Office of the Provost and the Office of the General Counsel, as necessary: (1) decide on what actions to take in light of the report, (2) notify the respondent and the dean or director of the decision, (3) decide whether or not the complainant will be notified, and (4) decide if and when external agencies or others, if any, are to be notified, what any such notification will include, and to whom it should be directed.

G. Resolution and Outcome

When allegations are not confirmed by the inquiry or the investigation, the University will consider, as appropriate and feasible, ways to restore the reputations of persons alleged to have engaged in misconduct, and to protect the positions and reputations of those persons who, in good faith, made allegations.

If the University determines that research misconduct has occurred, the next step(s) depend upon the type of appointment the respondent holds, the seriousness of the misconduct, and the sanctions recommended. The substantive determination of misconduct itself will not, however, be subject to challenge. Below are some examples:

1. **Faculty Cases Covered by Regents' Bylaw 5.09**
If the Vice President for Research accepts the recommendations made by the investigation committee for sanction or dismissal, demotion, or terminal appointment against a faculty member to whom Regents' Bylaw 5.09 applies, the Provost and Executive Vice President for Academic Affairs may initiate the procedures required by the Bylaw.

2. **Faculty Cases in Which Bylaw 5.09 Does Not Apply**
In cases to which Regents' Bylaw 5.09 does not apply, but which are covered by a school or college faculty grievance procedure, the dean will decide on the appropriate outcome, which the faculty member may then challenge through the applicable faculty grievance procedures.

3. **Cases Not Involving Faculty**
In cases not involving faculty, the appropriate University manager and personnel department will initiate procedures required by the University's Standard Practice Guide 201.12, "Discipline", or the appropriate collective bargaining agreement.

Staff members subject to the terms and conditions of collective bargaining agreements should consult the specific provisions in their current agreements dealing with misconduct. Any provision in such agreements that provide greater protections than the provisions stated herein supersede the affected provision of these procedures. Information concerning staff members covered by collective bargaining agreements may be obtained from the appropriate human resources office.

Cases involving students will be referred to the appropriate school or college for disciplinary actions.

4. **Record Retention**
All inquiry and investigatory files and final reports will be maintained and secured by the RIO for a period of seven years from the date of receipt of the allegation, or for the period required by applicable regulations.

5. **Questions**
Questions regarding these procedures may be directed to the Office of the Vice President for Research or the Office of the General Counsel.