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.

Case No. 2:21-cv-00316

Hon. Joseph R. Goodwin

DEFENDANT-INTERVENOR AND THE STATE OF WEST VIRGINIA'S MEMORANDUM IN RESPONSE TO PLAINTIFF'S MOTION TO EXCLUDE THE EXPERT TESTIMONY OF DR. GREGORY A. BROWN

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INTRODUCTION

Girls deserve a fair chance to play and to win at school sports. Recognizing this, West Virginia enacted the Sports Act to "promote equal athletic opportunities for the female sex" by limiting female sports teams starting in middle school to biological women. W. Va. Code § 18-2-25d(a)(5). Plaintiff B.P.J., though, attacks the Act for violating the Equal Protection Clause and Title IX, denying that the Act advances the State's interest in providing equal athletic opportunities for biological women.

To rebut this contention, the State and Intervenor Lainey Armistead (Respondents) named Dr. Gregory Brown, Ph.D., a tenured professor of exercise science at a major public university, as an expert to offer opinions about sex-based advantages in sports. Dr. Brown opines that (1) adult and adolescent males have substantial performance advantages over age-matched adult and adolescent females; (2) once a biological male experiences puberty, testosterone suppression does not erase all of those advantages; (3) sex-based differences in athletic performance emerge before puberty; (4) there is a biological component to those differences; and (5) there is no published evidence showing the administration of puberty blockers erases the pre-existing advantages that males have over females before puberty.

Dr. Brown supported these opinions in a 58-page, 177-paragraph expert report that cited 85 sources—most of which were peer-reviewed academic studies—and contained his own independent analysis of athletic-performance data. Each opinion was grounded in and built upon multiple sources of evidence.

Nonetheless, B.P.J. moved to exclude some of Dr. Brown's opinions as unreliable. B.P.J. contends that Dr. Brown performed a "results-driven analysis" and quibbles with the way he described a few sources. But, tellingly, B.P.J. rarely disputes the underlying science Dr. Brown reported. Likewise, B.P.J. takes issue with the fact that Dr. Brown has been asked to testify in multiple court cases and legislative

hearings—hardly a rarity for an academic active in his field. But this criticism doesn't get at the reliability of what Dr. Brown says.[1]

Dr. Brown's opinions in fact are reliable. They are well-sourced, well-cited, and based on methodologies common in the field of exercise science. His opinions easily clear the threshold for presentation to the factfinder.

LEGAL STANDARD

Federal Rule of Evidence 702 allows the admission of expert testimony where an expert qualified by "knowledge, skill, experience, training, or education" offers testimony that will "help the trier of fact to . . . determine a fact in issue" and is "based on sufficient facts or data," "the product of reliable principles and methods," and the applications of principles and methods to the facts is reliable. Fed. R. Evid. 702.

The advent of Rule 702 "was intended to liberalize the introduction of relevant expert evidence." *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 261 (4th Cir. 1999). And the Court's gatekeeping function "is not intended to serve as a replacement for the adversary system." *In re Lipitor (Atovastatin Calcium) Mktg., Sales Pracs. & Prods. Liab. Litig.*, 892 F.3d 624, 631 (4th Cir. 2018) (cleaned up). Rather, confirming that an expert opinion need not be "generally accepted" to be admissible, the Supreme Court emphasized the role of "conventional devices" for testing an expert's testimony, such as "[v]igorous cross-examination," "presentation of contrary evidence," and summary judgment practice, rather than "wholesale exclusion." *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 584 (1993).

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[1] Suppl. Appendix to Def.-Intervenor's Mot. for Summ. J. (Supp. App.) 359 (Brown Dep. 32:12–33:6) (listing organizations that asked Dr. Brown to testify). As this Court has noted, what matters is whether an expert's opinion is reliable, not whether it was developed for the purpose of litigation. *Eghnayem v. Boston Sci. Corp.*, 57 F. Supp. 3d 658, 670 (S.D.W. Va 2014). In any event, as discussed *infra*, Dr. Brown's opinions in this case "grow[] naturally and directly out of research" he is publishing and presenting on in purely academic circles. *Id.* (cleaned up).

The touchstone of this analysis is whether an expert's opinion is reliable, not whether it is "irrefutable or certainly correct." *Eghnayem*, 57 F. Supp. 3d at 668 (cleaned up). One of the "hallmarks" of reliability is the citation of peer-reviewed literature. *Sardis v. Overhead Door Corp.*, 10 F.4th 268, 295 (4th Cir. 2021). That literature need not be unanimous, just reliable. *R.W. v. Bd. of Regents of the Univ. Sys. of Ga.*, 114 F. Supp. 3d 1260, 1275 (N.D. Ga. 2015). Ultimately, Rule 702 calls for a "flexible" analysis "on the 'principles and methodology' employed by the expert, not on the conclusions reached." *Westberry*, 178 F.3d at 261.

ARGUMENT

I. B.P.J. does not challenge Dr. Brown's demonstration that biological men and adolescent boys have substantial physiological performance advantages over biological women and adolescent girls.

Though styled as a motion to exclude Dr. Brown's report entirely, the motion argues no such thing. Nothing in the motion challenges the basic opinions reflected in Sections II and III of Dr. Brown's report, documenting the substantial performance and physiological advantages that men and adolescent boys (i.e., boys who have begun puberty) have over women and adolescent girls in most athletic events. Def.-Intervenor's App. in Supp. of Mot. for Summ. J., ECF No. 286–1 (App.) 127–143 (Brown Rep. ¶¶ 7–67).[2] As a professor of exercise science, these are opinions Dr. Brown is qualified to offer, and they are cited to copious peer-reviewed evidence. *Id.*

These opinions matter because the Sports Act primarily regulates pubertal and post-pubertal athletes.[3] The Act does not apply until sixth grade. W. Va. Code § 18-2-25d. Given that the typical sixth grader is, like B.P.J., 11 or 12 years old, and the

[2] All citations to filed documents are to the original or bates-stamped page number.
[3] B.P.J.'s motion does **not** argue that these opinions are irrelevant. Accordingly, any such argument is waived. *Oliver v. Baity*, 208 F. Supp. 3d 681, 690 (M.D.N.C. 2016) (failure to address an issue concedes it). Respondents merely discuss relevance to inform the Court's understanding of Dr. Brown's testimony.

average biological male begins puberty around 12 years old, App. 1077 (Dolan Dep. 39:7–10) App. 1091 (Dolan Dep. 97:11–16)), the Sports Act only regulates approximately one year of prepubertal athletic activity. Supp. App. to Def.-Intervenor's Mot. for Summ. J., ECF No. 300 (Supp. App.) 130-31 (Safer Rebuttal Rep. ¶ 17 n.4). The remainder of its effects—10 years' worth counting 7th through 12th grades and four years of college eligibility—are on pubertal and post-pubertal athletes, who are the focus of Sections II and III of Dr. Brown's report.

What's more, B.P.J. contends that Equal Protection and Title IX require that biological males be permitted to play women's sports ***based on gender identity alone***. Def.-Intervenor's Mot. for Summ. J. 12–13, ECF No. 288. Sections II and III of Dr. Brown's report show that this proposal would result in gross competitive unfairness to adolescent and adult biological females because of the physiological and performance advantages that adolescent and adult males have over them. These sections demonstrate that separation of sports teams based on biological sex advances the State's interest in equal opportunity.[4] Accordingly, regardless of the disposition of B.P.J.'s motion, Dr. Brown should be permitted to offer these opinions.

II. Dr. Brown's use of the terms "biological male" and "biological female" are appropriate and well-grounded in the scientific literature.

Dr. Brown's report begins with a section discussing biological sex, which is dichotomous and easily identifiable in the overwhelming majority of the population. App. 125–27 (Brown Rep. ¶¶ 1–6). The purpose of this section is simply to introduce the concept, as it is common in exercise science to study sex-based differences in various aspects of exercise physiology and performance, and Dr. Brown cites peer-reviewed literature discussing such differences throughout his report.

[4] Sections II and III of Dr. Brown's report also negate any argument against the Sports Act's facial validity. Many biological males who identify as transgender receive no hormone treatment at all. B.P.J. offers no reason why they are similarly situated to biological women in athletics.

B.P.J., however, contends that Dr. Brown is not qualified to offer an opinion on "the medical and scientific communities' understanding of sex's biological elements." Mem. in Supp. of Pl.'s Mot. to Exclude Expert Test. of Gregory Brown (Pl.'s Mot.), ECF No. 316 at 6. This criticism ignores that Dr. Brown ***is*** a member of the scientific community that studies sex-based differences. As the holder of a Ph.D. in health and human performance, a tenured professor of exercise science, someone who has studied graduate-level endocrinology,[5] and a Fellow in the American College of Sports Medicine, he plainly has the knowledge, skill, education, training, and experience to discuss the biological basis for sex difference. Daubert Resp. App. to the Def.-Intervenor and the State of W.V.'s Joint Mem. in Resp. to Pl.'s Mots. to Exclude Experts' Test. Daubert Resp. App. 7 (Brown CV).[6]

Further, Dr. Brown's discussion is grounded in the academic literature. It cites multiple peer-reviewed papers and statements from scientific bodies.[7] These sources support his statement that sex is a biological concept, determined at conception, and unambiguous in the overwhelming majority of humans.

B.P.J. ignores seven of the eight sources that Dr. Brown cites and focuses exclusively on a statement by the Endocrine Society, selectively quoting it to argue that Dr. Brown misrepresents that statement. He does not. While the Endocrine Society statement discusses a variety of disorders of sexual development that can lead to ambiguity in an individual's biological sex, the statement affirms these are rare, that "sex determination begins with the inheritance of XX or XY chromosomes," and "all phenotypic sex differences … stem originally from the unequal effects of XX and

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[5] Supp. App. 364 (Brown Dep. 51:2–3).

[6] The Daubert Response Appendix was filed contemporaneously.

[7] *See* Daubert App. 379–418 (Endocrine Society), Daubert Resp. App. 656 (Sax, peer-reviewed), *id.* at 268 (Gershoni 2017, peer-reviewed), *id.* at 891 (Heydari 2022, peer-reviewed), *id.* at 289 (Haizlip 2015, peer-reviewed), *id.* at 33 (American Psychological Association), *id.* at 674 (Shah 2014, peer-reviewed), *id.* at 620 (Miller 2014, peer-reviewed).

XY sex chromosomes." Appendix to Def-Intervenor and the State of W. V.'s Mots. to Exclude Expert Testimony of Drs. Adkins, Fry, Janssen, and Safer, ECF No. 307–2 (Daubert App.) 381–82 (Bhargava 221–22). In other words, Dr. Brown is correct—and certainly within the acceptable bounds of expert testimony—in explaining that sex is a biological concept that is determined at conception and unambiguous in the overwhelming majority of cases.[8]

What's more, B.P.J.'s expert, Dr. Deanna Adkins, gave similar testimony at her deposition, affirming that "[s]ex is a biological concept," "the genetic sex of an infant is determined at the moment of conception," absent a "chromosomal abnormality," "an individual … who has an X and Y chromosome is male," and reproduction requires "a gamete from a male and a gamete from a female." App. 772 (Adkins Dep. 74:13–14); App. 763 (Adkins Dep. 40:5–14; 40:16–24; 41:2–15). Further, as Dr. Adkins admitted, the academic literature—including a paper by Dr. Adkins—is replete with references to "biological sex" and affirmations that sex is a biological concept. Daubert App. 579 (Lapinski 692). In short, there is nothing controversial about Dr. Brown's discussion of sex as a biological reality.

"[T]he test for exclusion is a strict one …. [O]ne knowledgeable about a particular subject need not be precisely informed about all details of the issues raised in order to offer an opinion." *Kopf v. Skyrm*, 993 F.2d 374, 377 (4th Cir. 1993) (cleaned up). Here, Dr. Brown is plainly knowledgeable about the biology of sex differences, and there is no basis to preclude him from discussing it, particularly to introduce how exercise physiologists study the effects of those differences on athletic performance.

[8] As is clear from Dr. Brown's report, and as he explained in his deposition, he is not offering any opinions with respect to disorders of sexual development. Supp. App. 363 (Brown Dep. 46:22–47:15). No such opinions would be relevant to this case in any event, since DSDs have nothing to do with B.P.J., the Sports Act, any legal theory advanced by B.P.J., or individuals who identify as transgender. *See* Mem. in Supp. of Mot. to Exclude Expert Testimony of Dr. Deanna Adkins, ECF 308, at 9–11.

III. Dr. Brown's opinion that testosterone suppression does not remove athletic advantages in post-puberty males is reliable.

In his report, Dr. Brown catalogued evidence from multiple peer-reviewed sources showing that male performance advantages endure after the suppression of testosterone. These studies showed a retained performance advantage in grip strength (four studies), which is typically used as a proxy for overall strength; arm strength (two studies); leg strength (two studies); and running / swimming speed (two studies and analysis of a transgender athlete's race times). App. 160–66 (Brown Rep. ¶¶ 123–144). They also showed a retained physiologic advantage in muscle mass (six studies), some but not all cardiovascular functions (one study),[9] and skeletal configuration (no dispute in the literature). App. 167–69 (Brown Rep. ¶¶ 149–157). Finally, he documented the trend in both the academic literature and sports organizations to recognize retained male advantage as a scientific reality that should inform policymaking. App. 170–76 (Brown Rep. ¶¶ 158–177).

B.P.J. contends that this evidence is somehow insufficient, but does not dispute evidence itself, much less provide any counter-evidence. And B.P.J. tries to deflect attention from the science by arguing that some of Dr. Brown's sources advocate a different policy than the one adopted by West Virginia. Neither argument undercuts the reliability of Dr. Brown's opinion.

A. Dr. Brown's scientific opinion is well-supported by the literature and Dr. Brown's own research.

Dr. Brown grounded his opinion on testosterone effects firmly in the applicable literature. *First,* Dr. Brown cited multiple sources of evidence that testosterone suppression does not eliminate the male advantage in running and swimming. These sources included the only peer-reviewed, published, controlled, non-self-reported

[9] Contrary to any assertion that Dr. Brown engaged in "cherry-picking," he noted up front that the evidence as to whether there was a retained advantage in VO2max was mixed and that he was aware of no evidence in either direction with regard to mitochondrial biogenesis.

study of running times in biological males undergoing testosterone suppression for two to two-and-a-half years. Daubert App. 691–697 (Roberts). And it showed that a 12% advantage in running time endured, which is particularly meaningful given that track events are often decided by far smaller margins. *Id.*; App. 155 (Brown Rep. ¶¶ 105–106). Dr. Brown also cited a recent study analyzing Lia Thomas's performance before and after testosterone suppression, and he included his own analysis of CeCe Telfer's performance before and after suppression. Daubert Resp. App. 671 (Senefeld); App. 163 (Brown Rep. ¶ 136). Notably, all of this direct evidence of durable performance advantage derived from running and swimming—sports that display some of the smallest baseline male advantages. Daubert App. 558–573 (Hilton).

Second, Dr. Brown cited evidence that testosterone suppression does not eliminate the building blocks of male performance advantage, including overall strength, arm strength, leg strength, muscle mass, lung volume, heart size, and stroke volume. App. 160–62, 167–69 (Brown Rep. ¶¶ 123–133, 149–157). B.P.J. does not appear to dispute that these measures contribute to athletic performance. While studies measuring direct athletic performance might be in some sense more direct, exercise scientists routinely measure these building blocks as a proxy for athletic performance.[10] And these measures clearly show a retained advantage for males.

B.P.J. cites no contrary evidence. In fact, B.P.J. did not retain any experts who specialize in exercise science. Instead, B.P.J. simply asks this Court to ignore the evidence that does exist because better evidence may be developed in the future. To be sure, research changes over time. Dr. Brown forthrightly noted in his report that the research to date is "limited" before summarizing the peer-reviewed research that

[10] Indeed, peer-reviewed studies regularly discuss these physiologic building blocks of athletic performance. *See, e.g.*, Daubert App. 514–522 (Harper), Daubert App. 483–509 (Handelsman), Daubert App. 558–573 (Hilton).

exists.[11] App. 159–160 (Brown Rep. ¶ 122). But "*Daubert* and *Kumho Tire* do not make the perfect the enemy of the reliable." *BorgWarner, Inc. v. Honeywell Int'l, Inc.*, 750 F. Supp. 2d 596, 615 (W.D.N.C. 2010). Here, Dr. Brown cited more than 10 peer-reviewed studies. Whether that is "enough" evidence goes to the weight of his opinion, not its reliability. *Ruiz-Troche v. Pepsi Cola of Puerto Rico Bottling Co.*, 161 F.3d 77, 85 (1st Cir. 1998) ("As long as an expert's scientific testimony rests upon good grounds, based on what is known, it should be tested by the adversary process … rather than excluded ….") (cleaned up).

B. Dr. Brown does not offer an opinion on the "best" or "fairest" policy, as that is the role of policymakers, not expert witnesses.

Rather than contest the science, B.P.J. faults Dr. Brown for ignoring how some of his sources pushed different sports policies than West Virginia's Act. But this criticism misapprehends the purpose and relevance of Dr. Brown's testimony.

This Court will evaluate whether the Sports Act has a "rational basis" or is "substantially related" to an important government objective. Dr. Brown's report explains what science says about male performance advantage, including its durability after testosterone suppression, to aid the Court in understanding how the Sports Act advances the objective of equal athletic opportunity.

Dr. Brown does not offer an opinion as to what would be the "best" or "fairest" policy for handling athletes who identify with the opposite sex. Indeed, as Dr. Brown testified, his role is to lay out the scientific evidence, not to render an opinion on what policy would be "fair versus unfair." Supp. App. 377 (Brown Dep. 102:19–24); Supp. App. 420 (Brown Dep. 277:24–278:22).

[11] B.P.J.'s attempt to characterize Dr. Brown's report as materially different from his academic writing on the subject is spurious. In every forum, he has noted that the available evidence is limited.

Thus, B.P.J.'s argument that Dr. Brown cites sources that disagree with West Virginia's *policy decision* is of no moment. Two of these sources, Hilton and Harper, are academic literature reviews, which Dr. Brown cited for their comments on the *scientific* question—whether there is retained male advantage despite testosterone suppression—not whether they, in B.P.J.'s words, "advocate" for the same policy as West Virginia.[12] Both are clear that, based on current evidence, testosterone suppression does not erase all contributors to male advantage.[13]

The other three sources B.P.J. identifies are policy documents, not peer-reviewed articles, each of which Dr. Brown cited to show a growing recognition that testosterone suppression does not erase all male advantages. Each citation was accurate. The first was a law review article by Duke Law Professor and former women's All-American runner Doriane Coleman, cited for its data collection about male-performance advantage. App. 127 (Brown Rep. ¶ 8). The article summarizes literature showing that "even when trans women and girls use blockers and/or gender affirming hormones, male legacy advantages remain if their therapy begins only after the onset of puberty." Daubert Resp. App. 142 (Coleman at 97). What Prof. Coleman thinks a state's policy should be is not relevant.

Similarly, Dr. Brown cited a "briefing book" by the Women's Sports Policy Working Group, which acknowledged, "the evidence is increasingly clear that

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[12] Indeed, it is telling that B.P.J. describes the Women's Sports Policy Working Group, Coleman, and Hilton articles as "advocat[ing]" for particular policies and then faults Dr. Brown for not citing their advocacy positions. Pl.'s Mot. at 21–23. The Court does not need "advocacy." What matters is the science, and that's what Dr. Brown cited.

[13] Daubert App. 568 ("The data presented here demonstrate that superior anthropometric, muscle mass and strength parameters achieved by males at puberty, and underpinning a considerable portion of the male performance advantage over females, are not removed by the current regimen of testosterone suppression …. Rather, it appears that the male performance advantage remains substantial."); Daubert App. 520 ("[T]he small decrease in strength in transwomen after 12–36 months of GAHT suggests that transwomen likely retain a strength advantage over cisgender women.").

hormones do not eliminate the legacy advantages associated with male physical development." Daubert Resp. App. 855 (Women's Sports Policy Group at 8), App. 171–72 (Brown Rep. ¶¶ 169–70). This acknowledgement is repeated multiple times. *Id.* at 876–77 (Women's Sports Policy Group at 29–30). What policy the group thinks should derive from this evidence is not relevant.

Likewise, Dr. Brown cited a federation's statement to show the increasing recognition of legacy male performance advantage. App. 171 (Brown Rep. ¶ 167). That statement acknowledged such evidence, discussed the Hilton and Roberts papers concerning legacy advantage, noted current evidence does not demonstrate that "the athletic capabilities of transwomen individuals undergoing HRT or GAS are comparable to those of cisgender women," and posited that more study is needed on "the extent of advantage remaining in transwomen athletes post-gender-affirming treatment." Daubert Resp. App. 303–04 (Hamilton). While the statement does not recommend the policy West Virginia adopted, it serves as evidence that commentators admit that legacy advantage is something to be considered.

Differing policy conclusions do not undercut the reliability of the science Dr. Brown presented, nor are they evidence of improper cherry-picking. This is much different than *In re Lipitor (Atorvastatin Calcium) Mktg., Sales Pracs. & Prods. Liab. Litig.*, the case B.P.J. relies on. 174 F. Supp. 3d 911 (D.S.C. 2016). There, the court disqualified a non-epidemiologist from opining about a causal link between Lipitor and diabetes because he *omitted* from his report eight key studies on that very question that conflicted with his opinion. *Id.* at 930. Here, Dr. Brown omitted nothing. Indeed, B.P.J.'s entire argument is based on policy statements (but not data) in documents *that Dr. Brown cited*.[14] And "it is not the Court's position as gatekeeper

[14] B.P.J. also mischaracterizes Dr. Brown's proffered reasons for not citing an organization's policy recommendation as mere "disagreement." What Dr. Brown really said is that he selected information to cite based on his "evaluat[ion] the other

to determine whose interpretation of the [cited] studies is correct." *In re Johnson & Johnson Talcum Powder Prods. Mktg., Sales Pracs. & Prods. Liab. Litig.*, 509 F. Supp. 3d 116, 180 (D.N.J. 2020).

Moreover, organizational "position statements are not expert opinions." *Eghnayem*, 57 F. Supp. 3d at 720. Accordingly, Dr. Brown was not required to cite them. And he certainly was not required to note every time a source's policy recommendation differed from the policy adopted by West Virginia, as it is not an expert's role to determine public policy. *Cf. Sec. & Exch. Comm'n v. Ambassador Advisors, LLC*, ___ F. Supp. 3d ___, Civil No. 5:20-cv-02274-JMB, 2021 WL 6052589, at *6 (E.D. Pa. Dec. 21, 2021) (rejecting expert's attempt to testify to appropriate policy for regulatory body); *Bd. of Trustees, Sheet Metal Workers' Nat'l Pension Fund v. Palladium Equity Partners, LLC*, 722 F. Supp. 2d 845, 853 (E.D. Mich. 2010) (expert opinion is a "policy-type argument[s]" that "fall[s] outside of the scope of expert testimony"). In sum, what Dr. Brown has offered is a well-founded, well-cited scientific opinion based on the available data-driven evidence that testosterone suppression does not eliminate male performance advantage. That opinion is reliable.

IV. Dr. Brown's opinion that biological males outperform biological females in most athletic endeavors before puberty is reliable.

In his report, Dr. Brown demonstrated that prepubertal boys exhibit athletic advantages over prepubertal girls.[15] He cited peer-reviewed evidence that, before puberty, boys tend to have more lean mass and less body fat than girls (five studies), higher aerobic output (two studies), and tend to outperform girls in a variety of

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scientific information," which is exactly what an expert should do to ensure his testimony is reliable. Supp. App. 409 (Brown Dep. 231:7–13). Regardless, an organization's policy recommendation is irrelevant to the science Dr. Brown presents.

[15] Dr. Brown did not opine that male advantage is static with age; rather, he was clear that male advantages "are magnified during puberty" and that "boys' physiological and performance advantages increase rapidly from the beginning of puberty until around age 17-19." App. 124–125, 145 (Brown Rep. Overview, 72).

athletic tests (twelve studies). He also analyzed performance data from fitness tests, national track and field records, and national results from cross-country meets.

B.P.J.'s motion ignores the bulk of this evidence, instead quibbling with Dr. Brown's description of two studies, claiming two other studies (both of which Dr. Brown cited) undercut his opinion, suggesting it was somehow inappropriate for an exercise physiologist to analyze data on exercise, and contending that Dr. Brown improperly changed his opinion by analyzing prepubertal athletic performance. These criticisms are without merit.[16]

A. The McManus and Staiano articles support Dr. Brown's analysis.

Dr. Brown cited a 2011 study by McManus for the proposition that prepubertal boys tend to have approximately 10% more lean body mass than prepubertal girls. App. 145 (Brown Rep. ¶ 71). This matters because it is well-settled that lean body mass is a key contributor to athletic performance.[17]

B.P.J. then faults Dr. Brown for not noting that the McManus study found no difference between the sexes in measures of *some other physical characteristics*. But Dr. Brown never claimed that prepubertal boys and girls are physically different in *every* respect. What Dr. Brown claimed—and what the McManus citation supports—is that prepubertal boys and girls are different in *some* areas that contribute to athletic performance. McManus found measurable differences between prepubertal

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[16] B.P.J.'s claim that Dr. Brown denied his opinions were developed with the rigor attendant to peer-review publication is a gross mischaracterization of the testimony. What Dr. Brown actually said was that an expert report must be truthful, accurate, and that he would be entirely comfortable submitting these opinions in a peer-revied publication. Supp. App. 385–86 (Brown Dep. 135:24–138:10). And, as discussed *infra* at 20–21, Dr. Brown has presented his evidence on prepubertal performance advantage at an academic conference and in a peer-reviewed online forum.

[17] Peer-reviewed papers acknowledging the contribution of lean body mass (the largest component of which is muscle mass) are cited throughout Dr. Brown's report. Daubert Resp. App. 543, 545 (Lepers, 853, 855); Daubert App. 564–66 (Hilton); Daubert App. 514 (Harper).

boys and girls in lean body mass, fat mass, percent body fat, and peak oxygen uptake. Dauber Resp. App. 600–01, 603–04 (McManus at 27–28, 30–31). Accordingly, the citation was proper.

Likewise, Dr. Brown cited a Staiano paper for the proposition that prepubertal girls tend to have more body fat then prepubertal boys, which is exactly what it says: "In prepubertal children, girls typically have more T[otal] B[ody] F[at] than boys." Daubert Resp. App. 709 (Staiano). Notably, Dr. Brown cited three other peer-reviewed studies for this point with no objection from B.P.J. App. 145 (Brown Rep. ¶ 73), Daubert Resp. App. 217 (Davis), Daubert Resp. App. 749 (Taylor 1997), App. 572 (Taylor 2010).

B.P.J., however, contends that Dr. Brown's report is deceptive because Staiano's conclusion—that prepubertal girls tend to have more body fat—was not based on unanimous evidence, but rather on the weight of the evidence. Staiano noted that, of the 22 studies reviewed, four of them found similar body fat between boys and girls. Staiano suggested that these studies were influenced by a failure to control for "other influences like age, maturational status and obesity status." Daubert Resp. App. 709 (Staiano). In any event, Dr. Brown did not claim that the evidence was unanimous; he simply cited the peer-reviewed conclusion reached by Staiano based on 18 of the 22 studies Staiano reviewed. App. 145 (Brown Rep. ¶ 73). That isn't deceptive. And experts do not need unanimity to reach a reliable conclusion; rather, they are to look to the "great weight of the evidence," which is exactly what Dr. Brown did. *In re Bextra & Celebrex Mktg. Sales Pracs. & Prod. Liab. Litig.,* 524 F. Supp. 2d 1166, 1176 (N.D. Cal. 2007); *R.W. v. Bd. of Regents of the Univ. Sys. of Ga.*, 114 F. Supp. 3d 1260, 1274 (N.D. Ga. 2015) (affirming that unanimity is not required).

B. The Tønnessen and Handelsman studies support Dr. Brown's analysis.

B.P.J. claims that Dr. Brown's opinion is unreliable because it "relies on inapposite physical fitness surveys and his own collection of raw data" instead of characterizations by Tønnessen and Handelsman that prepubertal differences are minimal.[18] This criticism ignores the numerous peer-reviewed papers Dr. Brown cited measuring athletic performance in prepubertal children and is therefore wrong on its face.[19] Moreover, neither the Tønnessen nor Handelsman study—both of which Dr. Brown cited and discussed in his report—undercuts Dr. Brown's conclusion.

The Tønnessen study reviewed performance by 11 to 18 year-old boys and girls in Norway in four events—the 60m run, the 800m run, the high jump, and the long jump. And it found sex-based performance differences at the earliest age measured in all four. Daubert Resp. App. 827 (Tønnessen). The Handelsman study reviewed swimming, running, jumping, and handgrip results. And it reported sex-based differences in multiple categories at the earliest ages measured.[20] Daubert Resp. App. 314 (Handelsman 2017) App. 637 (Safer Dep. 91:12-20).

To be sure, the prepubertal sex-based differences measured by Tønnessen and Handelsman tended to be less than 6%, which Handelsman elsewhere characterized

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[18] The use of the word "surveys" implies that Dr. Brown used self-reported data or questionnaires. He did not. He used actual measurements of performance on physical fitness tests, which is far more reliable than self-reported information.

[19] *See, e.g.*, App. 146–152 (Brown Rep. ¶ 75) (citing Lesinski, Daubert Resp. App. 554) ¶ 76 (citing Tambalis, Daubert Resp. App. 730), ¶ 81 (citing UK Sports Council Literature Review, Daubert App. 903), ¶ 82 (citing Hilton, Daubert App. 560), ¶ 83 (citing Catley & Tomkinson, Daubert Resp. App. 129), ¶ 84 (citing Tomkinson, Daubert Resp. App. 814), ¶ 88 (citing Tomkinson, Daubert Resp. App. 783), ¶ 91 (citing De Miguel-Etayo, Daubert Resp. App. 222), 95 (citing Silverman, Daubert Resp. App. 699), 97 (citing Ramirez-Velez, Daubert Resp. App. 639), ¶ 98 (citing Taylor, Daubert Resp. App. 742), ¶ 100 (citing Thomas, Daubert Resp. App. 760).

[20] Dr. Brown included in his report Handelsman's chart showing prepubertal male performance advantages at ¶ 115 (App. 158).

as "minimal," and which B.P.J. characterizes as "insignificant." But B.P.J.'s characterizations have at least two problems.

First, B.P.J. cherry-picks these studies instead of taking them in the context of the 11 other peer-reviewed papers that Dr. Brown cited and the independent data analysis he performed, all of which demonstrate that Tønnessen and Handelsman are on the low end of the performance differences researchers have found. A complete review of the evidence shows performance differences are often (but not always) higher than 6% and sometimes well into double or even triple digits. App. 147–49, 151–53 (Brown Rep. ¶¶ 78, 80, 82–86, 88, 93, 95, 98–100).

Second, these characterizations are value judgments, not science.[21] Any argument about performance difference being "too small" is a legal argument against the Sports Act, not a reliability argument against Dr. Brown's opinion.[22] Dr. Brown has carefully laid out the average performance differentials between prepubertal boys and girls across numerous events, measured in numerous data sets, published in peer-reviewed journals by numerous researchers. His results bear the "hallmarks of reliability" of testing and peer-review and are therefore admissible. *Sardis v. Overhead Door Corp.*, 10 F.4th 268, 295 (4th Cir. 2021).

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[21] B.P.J. has not argued that the sex-based prepubertal differences reported lacked *statistical* significance. Neither Tønnessen nor Handelsman reported specific p-values by age group for each athletic test. But many of the articles Dr. Brown cited specifically reported p-values or effect sizes to demonstrate the statistical power of their results. *See, e.g.*, Daubert Resp. App. 730 (Tambalis), Daubert Resp. App. 639 (Ramirez-Velez), Daubert Resp. App. 129 (Catley & Tompkins).

[22] The differences are not "too small." A few seconds in a race, a few millimeters in jump height, or a slight advantage in throwing can be the difference between winning and losing—or between making the team and getting cut. App. 155 (Brown Rep. ¶¶ 105–106). Thus, the existence of a consistently measured, durable sex-based advantage, whether it's 15%, 10%, or even 2%, is more than sufficient to show that sex-separated sports substantially advance West Virginia's interest in providing equal athletic opportunities for biological females. But this argument goes to the merits of the case, not to the admissibility of Dr. Brown's opinion.

C. Dr. Brown is well-qualified to present independent analysis of athletic performance data.

B.P.J. next criticizes Dr. Brown for analyzing performance data. But data are the foundation of science. Without it, an expert's opinion is mere speculation. As Dr. Brown's academic achievements and publication record demonstrate, he is well-qualified to analyze exercise data. Further he used a method of analysis common in the peer-reviewed literature. App. 147 (Brown Rep. ¶ 78).

Where an expert performs his own data analysis, that analysis is admissible as long as it utilizes "valid reasoning and a reliable methodology." *East West LLC v. Rahman*, No. 1:11cv1380 JCC/TCB, 2012 WL 4105128, at *5 (E.D. Va. Sept. 17, 2012) (cleaned up). "[T]he admissibility test does not turn on whether the opinion has the best foundation or whether it is supported by the very best methodology, or unassailable research." *Id.*

Here, Dr. Brown analyzed five sets of data: (1) data from the Presidential Physical Fitness Test widely administered for more than 60 years, (2) American youth outdoor track records, (3) 2018 Regional Junior Olympic Championship results, (4) 2021 national cross-country and track and field results, and (5) 2021 West Virginia track and field results. All of them are reliable.

Presidential Physical Fitness Test. B.P.J.'s only criticism of the PFT data is that they are "not studies of people who have chosen to participate in competitive athletics." Pl.'s Mot. at 14. But that doesn't make the analysis unreliable. Indeed, exercise scientists publish peer-reviewed studies using physical fitness data all the time.[23] And the PFT data is particularly useful because it is broken down by percentile, allowing comparison of the fittest boys to the fittest girls. Nothing justifies excluding Dr. Brown's analysis because he used a type of dataset that is common in

[23] Examples include the Tambalis, Lesinski, Catley, Tompkins, De Miguel-Etayo, Eiberg, Malina, and Ramirez-Valdez studies cited in Dr. Brown's report.

his field. *See, e.g.*, *Hartle v. FirstEnergy Generation Corp.*, 7 F. Supp. 3d 510, 522–23 (W.D. Pa. 2014) ("*Daubert* does not require the 'best' methodology or data.").

Youth Outdoor Track Records and *2018 Regional Junior Olympic Championship.* B.P.J. does not appear to criticize these analyses.

2021 National Cross-Country / Track and Field Data. B.P.J's only criticism here is that this analysis "relies on a single year's worth of data" from Athletic.Net that has not been peer-reviewed. Pl.'s Mot. at 15. But that is not a requirement for reliability. *Cf. Smith v. Ford Motor Co.*, 215 F.3d 713, 720–21 (7th Cir. 2000) (nothing that application of common analytical techniques would not often be subject to publication and does not suggest a lack of reliability). And B.P.J. cites nothing for the proposition that a year's worth of the most recently available data from thousands of cross-country and track events across the country is inherently unreliable.[24] Nor are there any "anomalies" in the data, as B.P.J. claims.[25] The data show persistent, though not uniform, sex-based differences exist across a wide range of events and ages.

2021 West Virginia Cross-Country / Track and Field Data. B.P.J. does not criticize or cite this data, which Dr. Brown offered as evidence that there is nothing unusual about West Virginia that would distinguish it from the broader data showing persistent sex-based differences in athletic performance among prepubertal children.

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[24] The use of web-based athletic data is common in the scholarly literature. Handelsman, for example, used an internet compilation of records in his 2017 study. Daubert Resp. App. 314 (Handelsman). Millard-Stafford and Hilton also used web-based data sources. Daubert App. 558 (Hilton), Daubert Resp. App. 906 (Millard-Stafford). And Coleman and Higerd both used Athletic.Net data in their analyses. Daubert Resp. App. 142 (Coleman), Daubert Resp. App. 319 (Higerd).

[25] B.P.J. presents no statistical analysis of the data to show any purported "anomalies." B.P.J. could have retained an expert to present a contrary analysis of this or other data but did not. A flip comment by counsel, unsupported by any scientific analysis, does not render the data or Dr. Brown's analysis unreliable.

In sum, Dr. Brown is well-qualified to analyze raw data on athletic performance, and none of B.P.J.'s criticisms of Dr. Brown's data analysis come close to warranting exclusion of that analysis.

D. Dr. Brown did not change is his opinion.

With little to undermine Dr. Brown's opinions, B.P.J. suggests that Dr. Brown changed his opinion—from denying any differences in athletic performance before puberty in a prior opinion to asserting the opposite now. Not so. Dr. Brown's prior declaration was not designed to address the issue. Its purpose was to discuss the physiological and performance advantages that develop during male puberty and persist thereafter. Even so, it noted there was evidence showing performance differences before puberty. App. 128 (Brown Rep. ¶ 11).

Once Dr. Brown studied prepubertal performance differences in detail, he found they were persistent across numerous athletic events, and he reported those findings in the expert report at issue here as well as in academic fora.

The alleged contradictions between Dr. Brown's prior declaration and the expert report at issue fall into two categories: (1) citations to the Handelsman and Tønnessen studies previously discussed and (2) areas where Dr. Brown largely agrees with the lack of any meaningful physiologic differences. Neither category undercuts the reliability of the peer-reviewed evidence or Dr. Brown's independent analysis about prepubertal performance differentials.

Handelsman and Tønnesen. Dr. Brown cited Handelsman throughout his prior declaration and current report. In his prior declaration, he quoted some of Handelsman's *characterizations of data* that males do not exhibit a performance advantage until puberty. But Dr. Brown went on to provide Handelsman's *data and charts* illustrating the existence of a prepubertal performance differential. *Compare* App. 134, 157–59 (Brown Rep. ¶¶ 25, 114, 119 *with* ¶¶ 26–28, 115). Likewise, while

Tønnessen characterized the prepubertal differences in four Norwegian track and field events as "negligible," the study itself reported *data* showing persistent differences in all four events, as discussed in more detail above. Because the existence (or not) of any prebupertal performance advantage was not material to the opinions Dr. Brown was offering, he did not focus on analyzing any such advantages.

Physiological Differences. The other allegedly contradictory statements derive from papers by Handelsman and Gooren stating that prepubertal boys and girls lack significant differences in height, muscle, and bone mass. App. 150–51, 157 (Brown Rep. ¶¶ 90, 95, 113). But there is no contradiction, as Dr. Brown has not claimed any pre-pubertal differences in height or bone mass. In writing his current report, he examined the statements about muscle more closely, which were not material to his prior declaration. And he found that the peer-reviewed studies that actually measured muscle mass found sex-based differences even in infants.[26] Daubert Resp. App. 596 (McManus), Daubert Resp. App. 217 (Davis), Daubert Resp. App. 752 (Taylor 2010). Adjusting his report to reflect the best scientific evidence on prepubertal physiologic differences is exactly what a reliable expert witness should do. *See Crowley v. Chait*, 322 F. Supp. 2d 530, 540 (D.N.J. 2004) (noting that an expert's evidence-based adjustments to his opinion "strengthen[] the quality of the expert report" and are not grounds for exclusion). Accordingly, these adjustments provide no basis for exclusion.

Even if Dr. Brown had materially changed his opinion (and he did not), that alone would not warrant exclusion. *Colony Ins. Co. v. Coca-Cola Co.*, 239 F.R.D. 666, 675–76 (N.D. Ga. 2007) (expert's opinion admissible even though he changed it

[26] The Gooren study cited to study by Jones (1998) that itself measured a statistically significant prepubertal sex-based difference in lean body mass. Daubert Resp. App. 935 (Jones & Dwyer (1998)). Handelsman did not appear to cite anything measuring prepubertal muscle mass.

shortly before his deposition). The question would still be whether the opinion presented in this case is reliable, and, for the reasons set forth above, it clearly is. *Id.*

Further demonstrating these adjustments reflect Dr. Brown's updated review of the science, he has published them twice in academic fora. In 2021, he published in a presentation to the American Physiological Society Sex and Gender conference much of the same fitness and performance data for prepubertal children that B.P.J. criticizes. Daubert Resp. App. 0934 (Brown Presentation). And just last week, he published a peer-reviewed online piece for physiology educators discussing sex-based prepubertal performance differences and utilizing the same sources and analysis contained in his expert report. Supp. App. 392 (Brown Dep. 162:4–164:7) (describing review process), Daubert Resp. App. 69 (Brown). These updates are deemed reliable by the scientific community, which makes them more than enough to satisfy *Daubert*. *Sardis*, 10 F.4th at 295 (calling peer review a "hallmark" of reliability).

V. Dr. Brown's opinion that there is a biological component to the pre-pubertal performance advantage is reliable.

Dr. Brown opined that the observed sex-based prepubertal physiologic and performance differences are attributable, at least in part, to biology and not entirely to social factors like boys receiving more encouragement to be physically active. App. 155–56 (Brown Rep. ¶¶ 107–108). He based this opinion on several pieces of evidence.

First, he cited evidence that prepuberal boys have physiological differences—primarily more lean body mass, less body fat, and higher aerobic output—that are known to contribute to athletic advantage. App. 145–46 (Brown Rep. ¶¶ 71–74). The fact that the contributions of these precise differences to athletic performance have not been quantified does not change the basic tenant of exercise science that more muscle, less fat, and more aerobic output leads to better athletic performance.[27]

[27] The contribution of these factors to athletic performance is discussed in Dr. Brown's report at ¶¶ 53–67 and in peer-reviewed studies cited throughout his report. *See, e.g.*,

Second, he cited a peer-reviewed study from Denmark showing that (1) when six and seven-year-old girls with the same accelerometer-measured physical activity level were compared, the boys were fitter and (2) despite controlling for body mass and muscle mass, boys still exhibited a higher VO2max (i.e., ability to metabolize and release energy). Daubert Resp. App. 237 (Eiberg). This strongly suggests that something more than social pressure to be active is driving prepubertal male athletic advantage. *Id.* Indeed, the study authors concluded that differences in body composition are part of the equation. *Id.*

Third, he cited a peer-reviewed study demonstrating that girls as young as four years old exhibit slower reaction times than boys. Daubert Resp. App. 526 (Latorre-Roman). Reaction time, as he noted, is a well-accepted component of athletic performance. App. 137 (Brown Rep. ¶¶ 38–41).

The earlier sex-based differences emerge and the more persistent they are across cultures (even egalitarian Scandinavian cultures) and athletic events, the more likely it is that biology plays a role. App. 155–56 (Brown Rep. ¶ 107). And the prepubertal physiological differences in muscle, fat, and aerobic output, all factors that relate to athletic performance, make a biological component all the more likely. While the precise contribution of social and biological factors may not have been measured, an "expert witnesses may draw reasonable inferences from the available evidence." *In re Flint Water Cases*, No. 17-10164, 2021 WL 5925190, at *4 (E.D. Mich. Dec. 15, 2021). Here, the evidence amply supports an opinion that there is a biological component to sex-based performance differences in prepubertal children.[28]

Daubert App. 492, 496 (Handelsman); Daubert Resp. App. 827 (Tønnessen at 7); Daubert Resp. App. 927 (Knox at 397).

[28] And B.P.J. cites no studies showing the differences are cause by social factors. Further, while this opinion is reliable and helpful to the factfinder, it is not necessary for upholding the Sports Act. Whether the observable sex-based differences in prepubertal sports performance are social, biological, or some of both, their existence

VI. Dr. Brown's opinion that no published evidence proves puberty blockers eliminate male prepubertal advantage is reliable.

Dr. Brown opined "there is no published scientific evidence that the administration of puberty blockers to males before puberty eliminates the pre-existing athletic advantage that prepubertal males have over prepubertal females in almost all athletic events." App. 124 (Brown Rep. Overview). B.P.J. has not cited any research to the contrary. And research on the effects of puberty blockers is minimal. App. 157 (Brown Rep. ¶ 113).

B.P.J. does not appear to disagree with the dearth of published research. Instead, B.P.J. contends that (1) it is improper to assume that biological boys who identify as girls have a pre-existing athletic advantage, (2) Dr. Brown did not discuss every finding from a study on how puberty blockers affect body composition, and (3) Dr. Brown does not account for the effects of a later application of cross-sex hormones on physiology. None of these criticisms helps B.P.J.

Athletic Advantage. As B.P.J.'s expert concedes, science has not identified a biological basis for gender identity. App. 669 (Safer Dep. 220:23–221:1). And B.PJ. has identified no population-level studies establishing any baseline physiological differences between biological males who identify as transgender and other biological males. So B.P.J. only speculates that prepubertal biological males with a transgender identity have innate differences from other prepubertal biological males.[29]

A few studies have noted small physiological differences in bone density, body fat, and strength between their samples of biological males who identified as transgender and their samples of biological males who did not. But none came close

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and persistence demonstrate that sex separation in sports promotes equal athletic opportunities for biological females.

[29] Dr. Safer admitted he could not "offer[] an opinion between those two groups [biological males who do and do not identify as transgender]," he could simply "rais[e] the possibility" of some unknown and unmeasured difference. App. 640–41 (104:10–106:12, 107:7–21).

to showing parity between age-matched biological males who identify as transgender *and biological females*.[30] Moreover these were not population-level studies designed to establish baseline comparisons, and the differences were very small. Supp. App. 416 (Brown Dep. 259:19–260:12).

No one disputes that further research on the physical attributes of people who identify as transgender is appropriate. And no one doubts research will provide more information about athletic advantage in the future. But, again, "*Daubert* and *Kumho Tire* do not make the perfect the enemy of the reliable." *BorgWarner, Inc.*, 750 F. Supp. 2d at 615. Dr. Brown has compiled copious evidence of sex-based differences in prepubertal physiology and athletic performance, and the current science supports applying this evidence to biological males regardless of gender identity.

The Klaver Study. Only one peer-reviewed study has analyzed the effects of puberty blockers on physiology related to determinants of athletic performance, a 2018 study by Klaver. As Dr. Brown reported, in this study, biological males who took puberty blockers reduced but did not erase the advantage in lean body mass they had over biological females. App. 157 (Brown Rep. ¶ 112). B.P.J. does not dispute this report but faults Dr. Brown for not also reporting that the biological males on puberty blockers exhibited total body fat similar to that of biological females. This criticism misapprehends the question Dr. Brown was answering: "Is there evidence that puberty suppression erases pre-existing male performance advantages?" Because of the retained advantage in lean body mass, the Klaver study does not change the

[30] In one study, the biological males who identified as transgender had greater handgrip strength than 90 to 95 percent of biological females. Supp. App. 416 (Brown Dep. 258:5–10). Daubert Resp. App. 662 (Scharff). In addition, the statement in Hilton concerning differences in the transgender population was cited to one study by Van Caenegem, which did not compare the study subjects to biological females. Daubert Resp. App. 835 (VanCaenegem). And the males who identified as female in the Klaver study exhibited a percentage of body fat nearly one standard deviation below that of the control group of biological females. Daubert Resp. App. 503 (Klaver).

answer to that question from "no" to "yes." The Klaver study presents a group of puberty suppressed biological males with comparable fat levels and more muscle than biological females, which does not demonstrate an erasure of pre-existing athletic advantage.

No one disputes the Klaver study has limitations. That's why Dr. Brown cited it for a negative proposition—it does *not* provide evidence that puberty suppression erases pre-existing performance advantages. Dr. Brown never claimed it "proves" retained athletic advantages follow puberty suppression or anything of the sort. Dr. Brown's careful use of the Klaver study underscore the reliability of his opinion.

Future Use of Cross-Sex Hormones. B.P.J. claims that Dr. Brown "wrongly assumes that puberty-delaying medication *followed by gender-affirming hormones* will freeze in place any alleged advantages that exist before puberty." Pl.'s Mot. at 17 (emphasis added). But Dr. Brown assumes nothing. He simply notes there is no evidence puberty blockers, whether followed by cross-sex hormones or not, eliminate the prepubertal physiological and performance advantages.[31] Since B.P.J.'s criticism fails to address Dr. Brown's actual opinion, it is unavailing.

CONCLUSION

Dr. Brown presented a well-researched and copiously cited report discussing the science of male performance advantage. Each of his opinions is grounded in the peer-reviewed literature and solid data and easily satisfies the threshold for reliability. For the foregoing reasons, B.P.J.'s motion to exclude portions of Dr. Brown's expert report should be denied.

[31] In the Klaver study, the subjects used puberty blockers followed by cross-sex hormones for an average of eight years of combined treatment, and their lean body mass remained 1.3 standard deviations higher than that of biological females.

Respectfully submitted this 26th day of May, 2022.

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

B.P.J., by her next friend and mother, HEATHER JACKSON *Plaintiff,* 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.*	Case No. 2:21-cv-00316 Hon. Joseph R. Goodwin

CERTIFICATE OF SERVICE

I, Brandon Steele, hereby certify that on May 26, 2022, I electronically filed a true and exact copy of the forgoing with the Clerk of Court and all parties using the CM/ECF system.

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