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Biased Science: The Texas and Alabama Measures Criminalizing Medical Treatment for Transgender Children and Adolescents Rely on Inaccurate and Misleading Scientific Claims

Susan D. Boulware, M.D., Associate Professor of Clinical Pediatrics (Endocrinology), Yale School of Medicine; Director Clinical Operations, Section of Pediatric Endocrinology; Medical Director, Yale Pediatric Gender Program

Rebecca Kamody, PhD (Clinical Psychology), Assistant Professor, Yale School of Medicine: Child Study Center, Pediatrics, and Psychiatry

Laura Kuper PhD (Psychology), ABPP, Assistant Professor in Psychiatry, University of Texas Southwestern; Child & Adolescent Psychologist, Children's Medical Center Dallas

Meredithe McNamara, M.D., M.S., FAAP, Assistant Professor of Pediatrics (Adolescent Medicine), Yale School of Medicine

Christy Olezeski, PhD (Clinical Psychology), Associate Professor of Psychiatry, Yale Child Study Center and Pediatrics, Yale School of Medicine; Director, Yale Pediatric Gender Program

Nathalie Szilagyi, M.D., Instructor, Yale Child Study Center, Yale Pediatric Gender Program; Director, Greenwich Child and Adolescent Psychiatry, Greenwich Center for Gender & Sexuality

Anne Alstott, J.D., Jacquin D. Bierman Professor, Yale Law School; Professor, Yale Child Study Center[*]

Introduction and Summary

On February 18, 2022, Texas Attorney General Ken Paxton issued an interpretation of Texas state law (the "AG Opinion"), taking the position that certain medical procedures constitute child abuse as defined in the Texas Family Code.[1] Texas Governor Greg Abbott cited the AG Opinion as authority for his February 22, 2022 directive requiring the Texas Department of Family and Protective Services to "conduct a prompt and thorough investigation of any reported instances of these abusive procedures" (the "Governor's Directive").[2]

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[1] Tex. Op. Att'y. Gen. No. KP-0401 (Feb. 18, 2022) (hereinafter, "AG Opinion").

[2] Letter from Greg Abbott, Governor of Texas, to Jaime Masters, Commissioner, Texas Department of Family and Protective Services, Feb. 22, 2022, at https://gov.texas.gov/uploads/files/press/O-MastersJaime202202221358.pdf

On April 7, 2022, Governor Kay Ivey of Alabama signed S.B. 184 (the "Alabama Law"), which imposes felony penalties on anyone providing certain medical care to any child, adolescent, or young adult under age 19.[3]

We are a group of six scientists and one law professor. Among the scientists, three of us are M.D.s., three are PhD's, and all treat transgender children and adolescents in daily clinical practice. We all hold academic appointments at major medical schools, including the University of Texas Southwestern and Yale University. In this report, we examine in depth the scientific claims made in the AG Opinion and the text of the Alabama Law about medical care for transgender children and adolescents. Note that, although we reject the AG's assertion that gender-affirming care constitutes child abuse and we oppose the Alabama Law's criminalization of such care, we do not address, in this report, the legal validity of either.[4] In accordance with our expertise, our focus is on the science.

After examining the AG Opinion and the findings of "fact" in the Alabama Law in detail, we conclude that their medical claims are not grounded in reputable science and are full of errors of omission and inclusion. These errors, taken together, thoroughly discredit the AG Opinion's claim that standard medical care for transgender children and adolescents constitutes child abuse. The Alabama Law contains similar assertions of scientific fact, and these too are riddled with errors, calling into question the scientific foundations of the law.

In this report, we focus closely on the AG Opinion, because it contains a full explanation of its reasoning, while the Alabama law presents a list of purported scientific findings without argument or citation. We note, throughout, when the purported findings in the Alabama law echo the claims made in the AG Opinion.

The Texas Attorney General either misunderstands or deliberately misstates medical protocols and scientific evidence. The AG Opinion and the Alabama Law make exaggerated and unsupported claims about the course of treatment for gender dysphoria, specifically claiming that standard medical care for pediatric patients includes surgery on genitals and reproductive organs. In fact, the authoritative protocols for medical care for transgender children and adolescents, which define what we term "gender-affirming care," specifically state that individuals must be over the age of majority before they can undergo such surgery. The AG Opinion and the Alabama Law also ignore the mainstream scientific evidence showing the significant benefits of gender-affirming care and exaggerate potential risks.

These are not close calls or areas of reasonable disagreement. The AG Opinion and the Alabama Law's findings ignore established medical authorities and repeat discredited, outdated, and poor-quality information. The AG Opinion also mischaracterizes reputable sources and repeatedly cites a fringe group whose listed advisors have limited (or no) scientific and medical credentials and include well-known anti-trans activists.

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[3] Vulnerable Child Compassion and Protection Act, 2022 Ala. Laws 289 (hereinafter, "Alabama Law").
[4] For legal analysis, see Plaintiffs' Original Petition and Application for Temporary Restraining Order, Temporary Injunction, Permanent Injunction, and Request for Declaratory Relief, Doe v. Abbott, March 1, 2022, at https://www.aclu.org/legal-document/doe-v-abbott-petition.

The AG Opinion falsely implies that puberty blockers and hormones are administered to prepubertal children, when, in fact, the standard medical protocols recommend drug treatments only for adolescents (and not prepubertal children). For purposes of this report, we use the term "adolescent" to refer to a child under the age of majority in whom pubertal development has begun.

The AG Opinion also omits mention of the extensive safeguards established by the standard protocols to ensure that medication is needed and that adolescents and their parents give informed assent and consent, respectively, to treatment when it is determined to be essential care. There is no rush to treatment: the course of gender-affirming care is tailored to each individual, and standard protocols mandate a process of consultation involving an interdisciplinary team including mental health professionals, medical providers, and parents.

By omitting the evidence demonstrating the substantial benefits of treatment for gender dysphoria, and by focusing on invented and exaggerated harms, the AG Opinion and the Alabama Law portray a warped picture of the scientific evidence. Contrary to their claims, a solid body of reputable evidence shows that gender-affirming care can be lifesaving and significantly improves mental health and reduces suicide attempts. The standard medical protocols were crafted by bodies of international experts based on a solid scientific foundation and have been in use for decades. Thus, treating gender dysphoria is considered not only ethical but also the clinically and medically recommended standard of care. Indeed, it would be considered unethical to *withhold* medical care from patients with gender dysphoria, just as it would be unethical to withhold potentially lifesaving care for patients with any other serious medical condition.

The repeated errors and omissions in the AG Opinion are so consistent and so extensive that it is difficult to believe that the opinion represents a good-faith effort to draw legal conclusions based on the best scientific evidence. It seems apparent that the AG Opinion is, rather, motivated by bias and crafted to achieve a preordained goal: to deny gender-affirming care to transgender youth. The same is true of the scientific claims made in the Alabama Law.

Many reputable scientific and professional organizations have issued statements opposing the Texas action,[5] but to our knowledge, none have conducted the in-depth, point-by-point review that we provide here.

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[5] See APA President Condemns Texas Governor's Directive to Report Parents of Transgender Minors [Internet]. Washington, D.C.: American Psychological Association; 2022 Feb 24 [cited 2022 Apr 15]. Available from: https://www.apa.org/news/press/releases/2022/02/report-parents-transgender-children; American Academy of Pediatrics, AAP, Texas Pediatric Society Oppose Actions in Texas Threatening Health of Transgender Youth [Internet]. Itasca (IL): American Academy of Pediatrics; 2022 Feb 24 [cited 2022 Apr 15]. Available from: https://www.aap.org/en/news-room/news-releases/aap/2022/aap-texas-pediatric-society-oppose-actions-in-texas-threatening-health-of-transgender-youth/; AACAP Statement Opposing Actions in Texas Threatening the Health, Mental Health and Well-Being of Transgender and Gender Diverse Youth and Their Families [Internet]. Washington, D.C.: American Academy of Child & Adolescent Psychiatry; 2022 March 1 [cited 2022 Apr 22]. Available from: https://www.aacap.org/AACAP/zLatest_News/AACAP_Statement_Opposing_Actions_in_Texas.aspx.
See also Letter from James L. Madara, CEO and Executive Vice President of the American Medical Association, to Bill McBride, Executive Director of the National Governors Association, April 26, 2021 (opposing legislation in

Throughout this report, we use the highest-quality scientific evidence available. In this context, large-scale, randomized controlled trials would be inappropriate for ethical reasons: when medical care has been shown (by other methods) to reduce gender dysphoria and improve mental health, as is the case for gender-affirming care for individuals with gender dysphoria, it would be unethical to deny that care to a control group of patients. This is true in many areas of medicine. In such cases, physicians instead rely on studies using other scientific methods, and they judge the relative quality of evidence based on several factors, including whether the study is peer-reviewed, published in a high-impact journal, up to date, and conducted by reputable investigators.

In this report, we cite studies that are peer-reviewed, up to date, conducted by respected investigators, and published in high-impact journals that are widely read. This represents the highest-quality evidence available to physicians making treatment decisions in this context. By contrast, the AG Opinion relies on very poor-quality evidence. Only two of its sources are peer-reviewed scientific studies. Of these, one is badly out-of-date, and the other is cited for a proposition that is irrelevant to the treatment of transgender children and adolescents.[6]

To summarize, we find that:

1. The AG Opinion and the Alabama Law falsely claim that current medical standards authorize the surgical sterilization of transgender children and adolescents. In fact, present medical standards state that individuals must be the age of majority or older before undergoing surgery on genitals or reproductive organs.

> Current medical protocols do not allow for either surgery or drug therapy for prepubertal children and specifically state that genital surgery should not be carried out before patients reach the legal age of majority. The standards of care do permit the careful use of drug therapies for adolescents (but not prepubertal children) and caution that drug therapies should be undertaken only after a careful, staged process of psychological and medical counseling. The AG Opinion's and Alabama Law's lists of "sex change procedures" and the claims that doctors are routinely sterilizing children and teenagers do not reflect current medical practice.

Arkansas and other states that would deny gender-affirming care), at https://www.ama-assn.org/press-center/press-releases/ama-states-stop-interfering-health-care-transgender-children; Clarke M, Farnan A, Barba A, Giovanni K, Brymer M, Julian J. Gender-Affirming Care Is Trauma-Informed Care [Internet]. Los Angeles (CA) and Durham (NC): National Child Traumatic Stress Network; 2022 [cited 2022 Apr 15]. Available from: https://www.nctsn.org/sites/default/files/resources/fact-sheet/gender-affirming-care-is-trauma-informed-care.pdf.

[6] One study is Dhejne C, Lichtenstein P, Boman M, Johansson AL, Langstrom N, Landen M. Long-term follow-up of transsexual persons undergoing sex reassignment surgery: cohort study in Sweden. PLoS One 2011 Feb 22;6(2):e16885. We discuss in Section 2 why Dhejne et al. is out of date and unsupportive of the AG's claims. The AG Opinion also cites one study for the proposition that "hysterectomy, oophorectomy, and orchiectomy result in permanent sterility." The cited study is Cheng PJ, Pastuszak AW, Myers JB, Goodwin IA, Hotaling JM. Fertility concerns of the transgender patient. Transl Androl Urol. 2019 Jun;8(3):209-218. As we explain in Section 1, current medical protocols do not authorize surgery on genitals or reproductive organs for anyone under the age of majority, and so the reference is irrelevant to the treatment of minors.

2. The AG Opinion and the Alabama Law ignore the substantial benefits of medical care for transgender children and adolescents, care which has consistently been shown to reduce gender dysphoria and improve mental health. The best scientific evidence shows that gender dysphoria is real, that untreated gender dysphoria leads predictably to serious, negative medical consequences, and that gender-affirming care significantly improves mental health outcomes, including reducing rates of suicide.

The AG Opinion and the Alabama Law omit any discussion of the demonstrated benefits of gender-affirming care as recognized by established medical science. The AG Opinion and the Alabama Law also greatly exaggerate the percentage of adolescents whose diagnosed gender dysphoria dissipates without gender-affirming care. And the AG Opinion repeats discredited evidence claiming that there is a wave of so-called "rapid-onset" gender dysphoria among U.S. adolescents.

3. The AG Opinion and the Alabama Law greatly exaggerate the risks of gender-affirming drug therapy.

The AG Opinion exhibits a poor understanding of medicine and consistently misstates medical protocols and scientific evidence. Contrary to the AG Opinion's statements, gender-affirming drug therapy (including puberty blockers and hormonal treatments) is safe and effective and has been approved by the major medical authorities. Puberty blockers are fully reversible; when discontinued, puberty begins, and fertility develops normally.

Gender-affirming hormone treatments can reduce fertility to some degree while ongoing, but the evidence suggests that these effects are reversible when hormone therapy is discontinued. Standard medical protocols manage these risks in the way any medical risks should be managed: by weighing the benefits of treatment against potential harms and by a careful and individualized process of consultation and consent. Indeed, the informed consent procedures for gender-affirming drug treatment are at least as rigorous as the consent required for any other drug treatment.

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Section 1. The AG Opinion and the Alabama Law falsely claim that current medical standards authorize the surgical sterilization of transgender children and adolescents. In fact, present medical standards state that individuals must be the age of majority or older before undergoing surgery on genitals or reproductive organs.

The AG Opinion asserts that the medical treatments for transgender children include a list of surgical procedures including "sterilization through castration, vasectomy, hysterectomy, oophorectomy, metoidioplasty, orchiectomy, penectomy, phalloplasty, and vaginoplasty."[7] The AG Opinion also claims that physicians dispense "drugs to children that induce transient or permanent infertility," including "(1) puberty-suppression or puberty-blocking drugs, (2) supraphysiologic doses of testosterone to females; and (3) supraphysiologic doses of estrogen to males."[8] The AG Opinion asserts that "[t] he novel trend of providing these elective sex changes to minors often has the effect of permanently sterilizing those minor children."[9] The Alabama Law contains similar statements.[10]

These statements are incorrect. Current medical protocols state that genital surgery should not be carried out before patients reach the legal age of majority. To make the distinction clear, we refer to the AG Opinion's list of procedures as the "AG Opinion claims." We refer to the standard medical protocols issued by the World Professional Association for Transgender Health ("WPATH") and the Endocrine Society as "gender-affirming care."[11]

The AG Opinion fails to engage with the WPATH and Endocrine Society guidelines (or any other recognized set of medical guidelines), even though these are well-known, widely viewed as authoritative, and readily available to the public.[12] These standards are explicitly

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[7] AG Opinion, p. 1. The AG Opinion also includes "(2) mastectomies; and (3) removing from children otherwise healthy or non-diseased body part or tissue." These procedures do not affect fertility, which is the opinion's stated concern, and they are common among cisgender adolescents (e.g., rhinoplasty and breast reduction). We do not address these procedures in this report.

[8] AG Opinion, p. 1.

[9] AG Opinion, pp. 2-3.

[10] Alabama Law, Section 2(6).

[11] See Coleman E, Bockting W, Botzer M, Cohen-Kettenis P, DeCuypere G, Feldman J, Fraser L, Green J, Knudson G, Meyer WJ, Monstrey S, Adler RK, Brown GR, Devor AH, Ehrbar R, Ettner R, Eyler E, Garofalo R, Karasic DH, Lev AI, Mayer G, Meyer-Bahlburg H, Hall BP, Pfafflin F, Rachlin K, Robinson B, Schechter LS, Tangpricha V, van Trotsenburg M, Vitale A, Winter S, Whittle S, Wylie KR, Zucker K. Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People, 7th version [Internet]. East Dundee (IL): World Professional Association for Transgender Health; 2012 [cited 2022 Apr 17]. Available from: https://www.wpath.org/publications/soc (hereinafter, "WPATH (2012)"); Hembree WC, Cohen-Kettenis PT, Gooren L, Hannema SE, Meyer WJ, Murad MH, Rosenthal SM, Safer JD, Tangpricha V, T'Sjoen GG. Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab. 2017 Sept 13;102(11):3869-3903 (hereinafter, "Endocrine Society (2017)").

[12] The AG Opinion quotes the WPATH standards once, but the opinion mischaracterizes the source material and persists in its repeated claims that gender-affirming care involves genital surgery on children. At page 4, the AG Opinion quotes WPATH (2012) to the effect that genital surgery should not be carried out before patients reach the age of majority. See AG Opinion, p. 4. The AG Opinion misleadingly uses the WPATH quotation as evidence that there is no benefit from gender-affirming care; in fact, WPATH (2012), pp. 10-21, acknowledges the benefits of psychotherapy and, in the case of adolescents, puberty blockers and hormone therapy. Apart from the isolated and misleading citation to WPATH (2012) at p. 4, the AG Opinion does not otherwise discuss the WPATH standards or correct its repeated assertion that children and adolescents are undergoing "sex change" procedures.

followed by major gender clinics in the United States.[13] We address the AG Opinion's misstatements in turn.

a. The medical standards of care for transgender children specifically state that individuals must be the age of majority or older before undergoing surgery on genitals or reproductive organs.

Gender dysphoria is a recognized medical condition[14] that merits medical treatment, and the evidence shows that treatment improves mental health outcomes, including reducing rates of suicidal ideation and suicide attempts. (See Section 2 of this report.)

Individuals with gender dysphoria seek care at a wide variety of ages, which depends on sociocultural and environmental factors, including parental support, socioeconomic status, and access to care. In the early phases of treatment, gender-affirming care consists of using the individual's preferred pronouns, psychosocial support, and education about the next stages of transition if desired. Medical professionals draw an important distinction between hormonal treatment and gender-affirming surgery. Hormonal transition is an established practice in older adolescents experiencing gender dysphoria, but current standards for gender-affirming care set the age of majority as the threshold for considering surgery on genitals and reproductive organs.

Two of the leading guidelines for the medical treatment of transgender children and adolescents are those published by WPATH and by the Endocrine Society. WPATH is a leading international organization of scientists, which has issued standards of care for transgender adults and children since 1979.[15] Several revisions have been made as scientific evidence drives changes in standards. The current version, WPATH Standards of Care, version 7, is viewed as authoritative in the medical community and is widely consulted by physicians and other clinicians. The WPATH standards explicitly state that genital surgery should not be carried out until the patient reaches the age of majority. Further, WPATH advises that "the age threshold should be seen as a minimum criterion and not an indication in and of itself for active intervention."[16]

The Endocrine Society is the leading international organization of endocrinologists, i.e., physicians specializing in the study and treatment of the human endocrine system, including hormonal treatment.[17] In 2017, the Endocrine Society issued clinical practice guidelines for the

[13] See Kuper LE, Stewart S, Preston S, Lau M, Lopez X. Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy. Pediatrics 2020 Apr;145(4):e20193006. doi: 10.1542/peds.2019-3006 (stating that Endocrine Society guidelines are followed). The same is true of the Greenwich Center for Gender & Sexuality. The Yale Pediatric Gender Clinic generally follows WPATH standards.

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

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

[16] WPATH (2012), at p. 21: "Genital surgery should not be carried out until (i) patients reach the legal age of majority to give consent for medical procedures in a given country, and (ii) patients have lived continuously for at least 12 months in the gender role that is congruent with their gender identity. The age threshold should be seen as a minimum criterion and not an indication in and of itself for active intervention."

[17] Who We Are [Internet]. Washington, D.C.: The Endocrine Society; c2022 [cited 2022 Apr 15]. Available from: https://www.endocrine.org/about-us.

treatment of gender dysphoria.[18] Like WPATH, the Endocrine Society does not authorize surgery on the genitals or reproductive organs of transgender children or adolescents.[19]

Both WPATH and Endocrine Society guidelines are based on reviews of the best available science conducted by panels of experts across medical disciplines. These guidelines are updated periodically to ensure that they reflect a current understanding of scientific knowledge and clinical practice. The statements in this report refer to current WPATH and Endocrine Society standards, i.e., those in force as of the date of publication of this report.

b. The standards of care do not recommend drug treatments (puberty blockers or hormones) for prepubertal children.

The AG Opinion wrongly conflates treatments available to adolescents with those offered to children.[20] In fact, current medical protocols for gender-affirming care do not recommend either surgery or drug treatments (puberty blockers and hormones) for prepubertal children.

The WPATH standards state clearly that physical interventions, including drug therapy, are recommended only for adolescents and only after an in-depth process of mental health and medical counseling, described below. The WPATH standards state that social transition, which is entirely reversible, may be considered by the parents of prepubertal children.[21] (Social transition consists of, e.g., wearing clothes and using a name that are consistent with the child's gender identity.) The Endocrine Society also "recommend[s] against puberty blocking and gender-affirming hormone treatment in prepubertal children."[22] (There is, of course, no need for such medication in children who have not reached puberty.)

c. Present standards of care recommend drug treatments for adolescents (youth who have developed pubertal changes) only for those with puberty-induced worsening gender dysphoria and only after a careful protocol that begins with psychological and medical counseling to ensure valid consent.

The AG Opinion claims that "[c]hildren and adolescents are promised relief and asked to 'consent' to life-altering, irreversible treatment—and to do so in the midst of reported psychological distress, when they cannot weigh long-term risks the way adults do."[23] The Alabama Law contains a similar statement.[24]

This statement misdescribes both medical practice and the consent procedures used for the treatment of adolescents. Legally, a parent or guardian must consent to the medical treatment of a minor, and so the AG Opinion is incorrect in implying that medical treatment depends on a

[18] Endocrine Society (2017).
[19] Id. (Guideline 5.5).
[20] AG Opinion, p. 2 (claiming that there is a "novel trend of providing these elective sex changes to minors," with "sex changes" previously defined to include surgery and drug therapies).
[21] WPATH (2012), p. 17.
[22] Endocrine Society (2017) (Guideline 1.4).
[23] AG Opinion, p. 4.
[24] Alabama Law, Section 2(15).

child or teenager's consent alone. [25] As noted above, medical protocols do not recommend drug therapy for prepubertal children, and so consent by young children is never an issue. For adolescents, the standard medical protocols provide for gender-affirming drug therapy only when medically necessary and after a comprehensive process that includes specialist medical consultation and assessment, parent consent and youth assent, and mental health evaluation.

A key feature of both the WPATH Standards of Care and the Endocrine Society Clinical Practice Guidelines is the central role of mental health professionals in assessing gender dysphoria and appropriate modes of medical treatment. The Endocrine Society notes, for example, that, "because of the psychological vulnerability of many individuals with [gender dysphoria], it is important that mental health care is available before, during, and sometimes also after transitioning."[26] Both WPATH and the Endocrine Society provide extensive guidance on how to provide psychosocial support to youth experiencing gender dysphoria, as well as a definition of what constitutes a properly trained mental health professional.

Contrary to the AG Opinion's implication, there is no medical rush to prescribe drug treatments to transgender adolescents. The current WPATH and Endocrine Society standards recommend a staged process for physical interventions, one that takes into account the presentation of gender dysphoria in each individual, along with their medical history and psychological functioning. Social transition, puberty blockers, and hormonal treatment may be used in stages, but not all adolescents with gender dysphoria undergo each treatment.[27] As always in medicine, the priority is to treat the patient as an individual and to address their physical and mental health needs holistically. WPATH, for example, expressly states that, "[b]efore any physical interventions are considered for adolescents, extensive exploration of psychological, family, and social issues should be undertaken …. The duration of this exploration may vary considerably depending on the complexity of the situation."[28]

WPATH and Endocrine Society standards recommend puberty-suppressing medications (GnRH agonist treatment), only for adolescents and only with guardrails to ensure that medication is medically necessary and that adolescents and their parents give informed consent to treatment. These safeguards are worth summarizing in some detail, because they contradict the AG Opinion's claim that gender-affirming care, including drug therapy, is being casually administered.[29]

For puberty-suppressing medications, the standards require the participation of a qualified mental health practitioner, who confirms that the adolescent has demonstrated a long-lasting and intense pattern of gender dysphoria, that gender dysphoria worsened with the onset of

[25] While the law usually grants parents the final decision, bioethicists have found that adolescents can be meaningful participants in the consent process. Clark BA, Virani A. "This Wasn't a Split-Second Decision": An Empirical Ethical Analysis of Transgender Youth Capacity, Rights, and Authority to Consent to Hormone Therapy. J Bioeth Inq. 2021 Mar;18(1):151-64; Vrouenraets LJJJ, de Vries ALC, de Vries MC, van der Miesen AIR, Hein IM. Assessing Medical Decision-Making Competence in Transgender Youth. Pediatrics 2021 Dec 1;148(6):e2020049643.
[26] Endocrine Society (2017).
[27] WPATH (2012), p. 18; Endocrine Society (2017) (Guidelines 2.1 and 2.2).
[28] WPATH (2012), p. 16.
[29] We quote the Endocrine Society phrasing, but the two protocols are substantively the same.

puberty, and that any coexisting psychological, medical, or social problems that could interfere with treatment have been addressed, so that the adolescent's situation and functioning are stable enough to start treatment. The guidelines also require informed assent by adolescents and (if under the age of majority) informed consent by their parents, and they require the involvement of a pediatric endocrinologist (or another physician versed in gender-affirming treatment) to ensure that puberty-blocking medication is warranted, that puberty has begun in the adolescent patient, and that there are no medical contraindications to puberty-blocking medication. [30]

For those adolescents for whom progression to hormone therapy is medically indicated, WPATH and the Endocrine Society require additional counseling regarding the possible fertility effects of hormone therapy. In addition to parental consent, the guidelines require that a mental health practitioner confirm that the adolescent has "sufficient mental capacity (which most adolescents have by age 16 years)" to evaluate the benefits and risks of treatment.[31]

Section 2. The AG Opinion and the Alabama Law ignore the substantial benefits of medical care for transgender children and adolescents, care which has consistently been shown to reduce gender dysphoria and improve mental health. The best scientific evidence shows that gender dysphoria is real, that untreated gender dysphoria leads predictably to serious, negative medical consequences, and that gender-affirming care significantly improves mental health outcomes, including reducing rates of suicide.

The AG Opinion omits any discussion of the documented benefits of gender-affirming care and vastly overstates potential risks by relying on misrepresented or unreliable studies. The AG Opinion also misstates scientific evidence on the percentage of children and adolescents whose gender dysphoria resolves without treatment (sometimes termed "desistance"), and the opinion repeats discredited evidence on a purported novel trend of so-called rapid-onset gender dysphoria. The Alabama Law contains similar errors.[32]

The AG Opinion falsely states that "The medical evidence does not demonstrate that children and adolescents benefit from engaging in these irreversible sterilization procedures."[33] Contrary to the AG Opinion's statements, scientific studies have demonstrated that gender dysphoria is a well-documented condition for which medical care is essential treatment. The established scientific evidence shows that treatment improves mental health outcomes, including reducing rates of suicidal ideation and suicide attempts.

In this Section, we review the scientific evidence on gender dysphoria and the benefits of gender-affirming treatment, and we correct the AG Opinion's and Alabama Law's erroneous claims.

a. Gender dysphoria is real, and untreated gender dysphoria is harmful.

The American Psychiatric Association explains that

[30] Endocrine Society (2017) (Table 5), citing WPATH (2012), p. 16.
[31] Endocrine Society (2017) (Table 5).
[32] Alabama Law, Section 2 and Section 2(4).
[33] AG Opinion, at 3.

> [T]he term "transgender" refers to a person whose sex assigned at birth (i.e., the sex assigned by a physician at birth, usually based on external genitalia) does not match their gender identity (i.e., one's psychological sense of their gender). Some people who are transgender will experience "gender dysphoria," which refers to psychological distress that results from an incongruence between one's sex assigned at birth and one's gender identity. Though gender dysphoria often begins in childhood, some people may not experience it until after puberty or much later.[34]

In 2013, the American Psychiatric Association released the fifth edition of the DSM-5, the standard reference for the diagnosis of mental health conditions. The DSM-5 recognizes gender dysphoria and sets forth criteria for diagnosis. These criteria include "a marked incongruence between one's experienced/expressed gender and primary and/or secondary sex characteristics" and "a strong conviction that one has the typical feelings and reactions of the other gender (or some alternative gender different from one's assigned gender)." To meet diagnostic criteria, an individual must exhibit "clinically significant distress or impairment in social, occupational, or other important areas of functioning."[35]

In other words, individuals who live in a manner that is physically and socially incongruent to their gender identity can experience gender dysphoria – a clinically significant psychological distress that can lead to depressed mood.[36] Suicidal ideation and attempts have been found to be significantly higher among transgender adolescents who cannot obtain or do not receive gender-affirming care than among their cisgender peers. The harm of not providing gender-affirming care is well documented: 40% of trans individuals who do not receive hormones will attempt or complete suicide in their lifetime.[37] Untreated gender dysphoria can also lead to disordered eating. Patients may engage in unsafe eating behaviors (e.g., food restriction or purging) as a body-affirming tool and an effort to align their bodies with their gender identity. These behaviors can impair physical health and development.[38]

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[34] What is Gender Dysphoria? [Internet]. Washington, D.C.: American Psychiatric Association; 2020 Nov [cited 2022 Apr 15]. Available from: https://www.psychiatry.org/patients-families/gender-dysphoria/what-is-gender-dysphoria.

[35] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Washington, D.C.: American Psychiatric Association; 2013.

[36] Sorbara JC, Chiniara LN, Thompson S, Palmert MR. Mental health and timing of gender-affirming care. Pediatrics 2020 Oct 1;146(4):e20193600 (hereinafter, "Sorbara et al. 2020").

[37] Herman JL, Brown TNT, Haas AP. Suicide Thoughts and Attempts Among Transgender Adults [Internet]. Los Angeles (CA): The Williams Institute, UCLA School of Law; 2019 Sept [cited 2022 Apr 1]. Available from: https://williamsinstitute.law.ucla.edu/publications/suicidality-transgender-adults/. So-called "conversion" therapy (an extreme form of denying gender-affirming care, which attempts to change a person's gender identity to match the sex assigned at birth) has been shown to create psychological distress and prompt suicide. Turban JL, Beckwith N, Reisner SL, Keuroghlian AS. Association Between Recalled Exposure to Gender Identity Conversion Efforts and Psychological Distress and Suicide Attempts Among Transgender Adults. JAMA Psychiatry 2019 Sept 11;77(1):68-76.

[38] Coelho JS, Suen J, Clark BA, Marshall SK, Geller J, Lam PY. Eating Disorder Diagnoses and Symptom Presentation in Transgender Youth: a Scoping Review. Curr Psychiatry Rep. 2019 Oct 15;21(11):107; Kamody RC, Yonkers K, Pluhar EI, Olezeski CL. Disordered Eating Among Trans-Masculine Youth: Considerations Through a Developmental Lens. LGBT Health. 2020 May/Jun;7(4):170-73; Legroux I, Cortet B. Factors influencing bone loss in anorexia nervosa: assessment and therapeutic options. RMD Open. 2019 Nov 13;5(2):e001009.

For all these reasons, the American Academy of Pediatrics, the American Psychological Association, and the American Academy of Child and Adolescent Psychiatry – the three major professional associations of pediatricians, psychologists, and child and adolescent psychiatrists – have endorsed gender-affirming care and condemned efforts to deny medical care to transgender people, as have the Texas Medical Society and the Alabama Psychological Association.[39] These organizations have also condemned so-called "conversion therapy" as ineffective, unethical, and dangerous.[40]

The scientific consensus is clear: denying gender-affirming care harms transgender people and puts their lives at risk.[41]

b. Gender-affirming care has measurable and significant benefits.

The AG Opinion incorrectly states that "There is no evidence that long-term mental health outcomes are improved or that rates of suicide are reduced by hormonal or surgical intervention."[42] The AG's statement that gender-affirming care is not beneficial is contradicted by a significant body of recent scientific evidence.[43]

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[39] Rafferty J, Committee on Psychosocial Aspects of Child and Family Health; Committee on Adolescence; Section on Lesbian, Gay, Bisexual, and Transgender Health and Wellness, Ensuring Comprehensive Care and Support for Transgender and Gender-Diverse Children and Adolescents. Pediatrics. 2018 Oct;142(4):e20182162; American Psychological Association. Guidelines for psychological practice with transgender and gender nonconforming people. American Psychologist 2015 Dec;70(9):832-64 (hereinafter, "American Psychological Association (2015)"); AAP Continues to Support Care of Transgender Youth as More States Push Restrictions [Internet]. Itasca (IL): American Academy of Pediatrics; 2022 Jan 6 [cited 2022 Mar 31]. Available from: https://publications.aap.org/aapnews/news/19021/AAP-continues-to-support-care-of-transgender; Criminalizing Gender Affirmative Care with Minors [Internet]. Washington, D.C.: American Psychological Association; [cited 2022 Mar 30]. Available from: https://www.apa.org/pi/lgbt/resources/policy/issues/gender-affirmative-care; AACAP Statement Opposing Actions in Texas Threatening the Health, Mental Health and Well-Being of Transgender and Gender Diverse Youth and Their Families, Washington, D.C.: American Academy of Child & Adolescent Psychiatry; 2022 March 1 [cited 2022 Apr 22=]. Available from: https://www.aacap.org/AACAP/zLatest_News/AACAP_Statement_Opposing_Actions_in_Texas.aspx; Statement of the Alabama Psychological Association (aPA) Supporting Gender-Affirming Care for Transgender Youth and Urging Opposition to Alabama SB184/HB266 [internet]. Alabama Psychological Association 2022. Available at https://cdn.ymaws.com/www.alapsych.org/resource/resmgr/2022/sb184-hb266_apa_statement_3-.pdf; Sorrel AL, TMA Supports Evidence-Based Gender-Affirming Care in Lawsuit [internet]. Texas Medical Association. March 14, 2022. Available from https://www.texmed.org/TexasMedicineDetail.aspx?id=59040.

[40] APA Resolution on Gender Identity Change Efforts [Internet]. Washington, D.C.: American Psychological Association; 2021 Feb [cited 2022 Mar 31]. Available from: https://www.apa.org/about/policy/resolution-gender-identity-change-efforts.pdf.

[41] Abreu RL, Sostre JP, Gonzalez KA, Lockett GM, Matsuno E. "I am afraid for those kids who might find death preferable": Parental figures' reactions and coping strategies to bans on gender-affirming care for transgender and gender diverse youth. Psychology of Sexual Orientation and Gender Diversity [Internet]. 2021 Jul 29 [cited 2022 Mar 31]; advance online publication. Available from: https://psycnet.apa.org/record/2021-67997-001; Hughes LD, Kidd KM, Gamarel KE, Operario D, Dowshen N. (2021). "These Laws Will Be Devastating": Provider Perspectives on Legislation Banning Gender-Affirming Care for Transgender Adolescents. Journal of Adolescent Health 2021 Dec;69(6):976-82; Kidd KM, Sequeira GM, Paglisotti T, Katz-Wise SL, Kazmerski TM, Hillier A, Miller E, Dowshen N. "This could mean death for my child": Parent perspectives on laws banning gender-affirming care for transgender adolescents. Journal of Adolescent Health 2021 Jun;68(6):1082-88.

[42] AG Opinion, p. 4.

[43] De Vries AL, Steensma TD, Doreleijers TA, Cohen-Kettenis PT. Puberty suppression in adolescents with gender identity disorder: A prospective follow-up study. The Journal of Sexual Medicine 2011 Aug;8(8):2276-83; De Vries

As explained in Section 1 of this report, social transition is an important first step for adolescents (and is the only medically accepted form of gender-affirming care for prepubertal children). The scientific evidence shows that social transition, including using a child or adolescent's chosen name, reduces depression and suicide risk.[44]

A solid body of reliable research has shown that the potential next steps in gender-affirming care for adolescents with gender dysphoria – puberty-blocking medications and hormone therapy – have major mental-health benefits, including higher levels of general well-being and significantly decreased levels of suicidality.[45] Puberty blockers have been shown to

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AL, McGuire JK, Steensma TD, Wagenaar EC, Doreleijers TA, Cohen-Kettenis PT. Young adult psychological outcome after puberty suppression and gender reassignment. Pediatrics 2014 Oct;134(4):696-704; Costa R, Dunsford M, Skagerberg E, Holt V, Carmichael P, Colizzi M. Psychological Support, Puberty Suppression, and Psychosocial Functioning in Adolescents with Gender Dysphoria. The Journal of Sexual Medicine 2015 Nov;12(11):2206-14 (hereinafter, "Costa et al. 2015"); Allen LR, Watson LB, Egan AM, Moser CN. Well-being and suicidality among transgender youth after gender-affirming hormones. Clinical Practice in Pediatric Psychology 2019 Sept;7(3):302-11 (hereinafter, ("Allen et al 2019"); Kaltiala R, Heino E, Tyolajarvi M, Suomalainen L. Adolescent development and psychosocial functioning after starting cross-sex hormones for gender dysphoria. Nordic Journal of Psychiatry 2020 Apr;74(3):213-19; de Lara DL, Rodriguez OP, Flores IC, Masa JLP, Campos-Munoz L, Hernandez MC, Amador JTR. Psychosocial assessment in transgender adolescents. Anales de Pediatria (English Edition) 2020 Jul;93(1):41-48; van der Miesen AI, Steensma TD, de Vries AL, Bos H, Popma A. Psychological Functioning in Transgender Adolescents Before and After Gender-Affirmative Care Compared with Cisgender General Population Peers. Journal of Adolescent Health 2020 Jun;66(6):699-704; Achille C, Taggart T, Eaton NR, Osipoff J, Tafuri K, Lane A, Wilson TA. Longitudinal impact of gender-affirming endocrine intervention on the mental health and well-being of transgender youths: preliminary results. International Journal of Pediatric Endocrinology 2020;2020:8; Kuper LE, Stewart S, Preston S, Lau M, Lopez X. Body Dissatisfaction and Mental Health Outcomes of Youth on Gender-Affirming Hormone Therapy. Pediatrics 2020 Apr;145(4):e20193006; Turban JL, King D, Carswell JM, Keuroghlian AS. Pubertal Suppression for Transgender Youth and Risk of Suicidal Ideation. Pediatrics 2020 Feb;145(2):e20191725; Carmichael P, Butler G, Masic U, Cole TJ, De Stavola BL, Davidson S, Skageberg EM, Khadr S, Viner RM. Short-term outcomes of pubertal suppression in a selected cohort of 12 to 15 year old young people with persistent gender dysphoria in the UK. PLoS One 2021 Feb 2;16(2):e0243894; Grannis C, Leibowitz SF, Gahn S, Nahata L, Morningstar M, Mattson WI, Chen D, Strang JF, Nelson EE. Testosterone treatment, internalizing symptoms, and body image dissatisfaction in transgender boys. Psychoneuroendocrinology 2021 Oct;132:105358; Hisle-Gorman E, Schvey NA, Adirim TA, Rayne AK, Susi A, Roberts TA, Klein DA. Mental Healthcare Utilization of Transgender Youth Before and After Affirming Treatment. The Journal of Sexual Medicine 2021 Aug;18(8):1444-54; Green AE, DeChants JP, Price MN, Davis CK. Association of Gender-Affirming Hormone Therapy with Depression, Thoughts of Suicide, and Attempted Suicide Among Transgender and Nonbinary Youth. Journal of Adolescent Health 2022 Apr;70(4):643-49 (hereinafter, "Green et al. 2022"); Turban JL, King D, Kobe J, Reisner SL, Keuroghlian AS. Access to gender-affirming hormones during adolescence and mental health outcomes among transgender adults. PLoS One 2022 Jan 12;17(1):e0261039 (hereinafter, "Turban et al. 2022"); Tordoff DM, Wanta JW, Collin A, Stephney C, Inwards-Breland DJ, Ahrens K. Mental Health Outcomes in Transgender and Nonbinary Youths Receiving Gender-Affirming Care. JAMA Network Open 2022 Feb 1;5(2):e220978 (hereinafter, "Tordoff et al. (2022)").

[44] Russell ST, Pollitt AM, Li G, Grossman AH. Chosen name use is linked to reduced depressive symptoms, suicidal ideation, and suicidal behavior among transgender youth. Journal of Adolescent Health 2018 Oct;63(4):503-05; Durwood L, McLaughlin KA, Olson KR. Mental health and self-worth in socially transitioned transgender youth. Journal of the American Academy of Child & Adolescent Psychiatry 2017 Feb;56(2):116-23.

[45] Allen et al. 2019, cited in note 43; Green et al. (2022), cited in note 43; Connolly MD, Zervos MJ, Barone II CJ, Johnson CC, Joseph CL. The Mental Health of Transgender Youth: Advances in Understanding. Journal of Adolescent Health 2016 Nov;59(5):489-95; Turban et al. 2022, cited in note 43; Costa et al. (2015), cited in note 43; See also Witcomb GL, Bouman WP, Claes L, Brewin N, Crawford JR, Arcelus J. Levels of depression in transgender people and its predictors: Results of a large matched control study with transgender people accessing clinical services. Journal of Affective Disorders 2018 Aug 1; 235:308-15.

decrease suicidality in adulthood and to improve affect and psychosocial functioning as well as social life.[46] Hormone therapy has been shown to reduce suicidality in transgender adolescents when compared to peers with gender dysphoria who did not receive it.[47] Notably, none of the studies has found a worsening of these mental health measures among recipients of gender-affirming care.

Among children and adolescents, patients who present for gender-affirming care at later pubertal stages are more likely to require psychoactive medications and are more likely to have considered or attempted suicide than patients who received gender-affirming care at earlier stages of pubertal development.[48]

As evidence for the proposition that "[t]here is no evidence that long-term mental health outcomes are improved or that rates of suicide are reduced by hormonal or surgical intervention," the AG Opinion cites a 2011 Swedish study by Dhejne et al. that, the AG Opinion claims, "monitored transitioned individuals for 30 years [and] found high rates of post-transition suicide and significantly elevated all-cause mortality, including increased death rates from cardiovascular disease and cancer, although causality could not be established."[49] In fact, the 2011 study by Dhejne is badly out-of-date and does not support the AG Opinion's claim.

The Dhejne study compared post-gender-affirmation transgender individuals with cisgender individuals from the general population, as opposed to transgender individuals who did not receive gender-affirming care. Therefore, as the study's author explicitly cautions in the body of the text, *it is impossible to conclude from this data* that gender-affirming procedures were a causative factor in suicidality among transgender individuals.[50] Rather, the study shows only that transgender adults were more likely to experience suicidal ideation/attempts and risky behavior when compared to the general population in Sweden between 1973 and 2003. Further, the Dhejne study is not generalizable to a modern American population or to adolescents. During the study period, Swedish law required that individuals seeking gender-affirming surgery be

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[46] Rew L, Young CC, Monge M, Bogucka R. Review: Puberty blockers for transgender and gender diverse youth – a critical review of the literature. Child and Adolescent Mental Health 2021 Feb;26(1):3-14; de Vries AL, Steensma TD, Doreleijers TA, Cohen-Kettenis PT. Puberty suppression in adolescents with gender identity disorder: a prospective follow-up study. J Sex Med. 2011 Aug;8(8):2276-83. Epub 2010 Jul 14 (hereinafter, "de Vries et al. (2011)").

[47] Tordoff et al (2022), cited in note 43; Sorbara et. al. (2020), cited in note 36.

[48] Sorbara JC et. al. (2020), cited in note 36. Studies of adults confirm that gender-affirming treatment has been associated with marked improvement in mental health outcomes in transgender patients. See Almazan AN, Keuroghlian AS. Association Between Gender-Affirming Surgeries and Mental Health Outcomes. JAMA Surgery 2021 Jul 1;156(7):611-18; Marano AA, Louis MR, Coon D. Gender-Affirming Surgeries and Improved Psychosocial Health Outcomes. JAMA Surgery 2021 Jul 1;156(7):685-87; Swan J, Phillips TM, Sanders T, Mullens AB, Debattista J and Bromdal A. Mental health and quality of life outcomes of gender-affirming surgery: A systematic literature review, Journal of Gay & Lesbian Mental Health, 2022.

[49] AG Opinion, at 4, citing Dhejne C, Lichtenstein P, Boman M, Johansson AL, Langstrom N, Landen M. Long-term follow-up of transsexual persons undergoing sex reassignment surgery: cohort study in Sweden. PLoS One 2011 Feb 22;6(2):e16885 (hereinafter, "Dhejne (2011)").

[50] "It is therefore important to note that the current study is only informative with respect to [transgender] persons' health after sex reassignment; *no inferences can be drawn as to the effectiveness of sex reassignment as a treatment for transsexualism*. In other words, the results should not be interpreted such as sex reassignment per se increases morbidity and mortality. Things might have been even worse without sex reassignment." Dhejne (2011) at 7 (emphasis added).

sterilized. The presence of this law alone might account for the higher risk of suicide attempts and risky behavior in the transgender population compared to the cisgender population at the time.[51]

The AG Opinion also mischaracterizes an important governmental decision, claiming incorrectly that the Centers for Medicare and Medicaid Services ("CMS") found that gender-affirming care has no benefits. The AG Opinion claims that "there is no scientific consensus that [medical care] even serve[s] to benefit minor children dealing with gender dysphoria," and that "[t]he lack of evidence in this field is why the CMS rejected a nationwide coverage mandate for adult gender transition surgeries during the Obama Administration."[52] Although the CMS did issue a 2016 Decision Memo denying blanket, automatic coverage for gender-affirming surgery, the decision specifically *authorizes* Medicare and Medicaid providers to cover such surgery on a case-by-case basis.[53] Thus, contrary to AG Opinion's claim, the CMS decision memo expressly *permits* state and local decision-makers to authorize coverage for gender-affirming surgery.[54] The federal directive simply declines to authorize automatic coverage in every case. And, in fact, the 2016 CMS decision marks an expansion of the permissibility of gender-affirming treatment: the Decision Memo followed the 2014 revocation of the CMS's 1989 decision to deny nationwide coverage.[55]

Further, the CMS did not reach any negative conclusion on the benefits of gender-affirming care for children and adolescents. The CMS reviewed only studies on the outcomes of surgery (not hormone treatment) for an adult population that is overwhelmingly elderly (over age 65) and has a high prevalence of preexisting medical conditions that can make surgery risky, regardless of its purpose.[56]

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[51] Nelson R. Transgender People in Sweden No Longer Face Forced Sterilization. Time [Internet]. 2013 Jan 14 [cited 2022 Apr 1]; Available from: https://newsfeed/time.com/2013/01/14/transgender-people-in-sweden-no-longer-face-forced-sterilization/. The presence of this law alone might account for the higher risk of suicide attempts and risky behavior in the transgender population at the time.

[52] AG Opinion, at 3-4, citing Jensen TS, Chin J, Rollins J, Koller E, Gousis L. Decision Memo for Gender Dysphoria and Gender Reassignment Surgery (CAG-00446N). Baltimore (MD): Centers for Medicare and Medicaid Services; 2016 Aug 30 [cited 2022 Feb 18]. Available from: https://www.cms.gov/medicare-coverage-database/view/ncacal-decision-memo.aspx?proposed=N&NCAId=282.

[53] Id.

[54] Id. ("We acknowledge that [gender reassignment surgery] may be a reasonable and necessary service for certain beneficiaries with gender dysphoria. The current scientific information is not complete for CMS to make a [national coverage decision] that identifies the precise patient population for whom the service would be reasonable and necessary.")

[55] Id.

[56] The CMS Decision Memo notes that "the Medicare population is different from the general population in age (65 years and older) and/or disability as defined by the Social Security Administration. Due to the biology of aging, older adults may respond to health care treatments differently than younger adults. These differences can be due to, for example, multiple health conditions or co-morbidities, longer duration needed for healing, metabolic variances, and impact of reduced mobility. All of these factors can impact health outcomes. The disabled Medicare population, who are younger than age 65, is different from the general population and typical study populations due to the presence of the causes of disability such as psychiatric disorders, musculoskeletal health issues, and cardiovascular issues." Id.

c. The AG Opinion repeats discredited and unreliable evidence on "desistance" and "rapid-onset gender dysphoria."

The AG Opinion greatly exaggerates the extent to which adolescent gender dysphoria abates without treatment, and it repeats discredited claims that there is a novel wave of rapid-onset dysphoria among today's teens.

"Desistance." The AG Opinion asserts that "[c]hildhood-onset gender dysphoria has been shown to have a high rate of natural resolution, with 61-98% of children reidentifying with their biological sex during puberty."[57] The Alabama law makes a parallel statement.[58] The assertion is incorrect.

As authority for the claimed 61-98% figure, the AG Opinion does not cite reputable scientific evidence. Instead, it cites a biased source – the website of the so-called Society for Evidence-Based Gender Medicine ("SEGM"). SEGM is not a recognized scientific organization, and in Appendix A we document the bias that infuses its medical claims. The SEGM website badly mischaracterizes the underlying source that it cites for the 61-98% figure.

The study SEGM cites is Steensma et al. (2013).[59] But the Steensma study was not designed to (and the lead author has acknowledged) does not provide a basis for calculating what percentage of prepubertal children diagnosed with gender dysphoria persist with that diagnosis into adolescence. Rather, the Steensma study was designed only to study the characteristics of those who persisted. [60] Among other limitations, in Steensma (2013), former patients who opted to not participate in the study (either refused to participate or did not respond to an offer to participate) were categorized as "desisters," i.e., patients whose gender dysphoria resolved without transition or treatment. Patients can fail to respond to a study request for many reasons, including having moved away, receiving treatment elsewhere, or being uninterested in participating in a study. Thus, SEGM misuses the Steensma data by counting nonresponding patients as having "desisted" in experiencing gender dysphoria.[61] Indeed, in published correspondence, Steensma emphasizes that the 2013 study should *not* be used to calculate the percentages of "persisters" and "desisters."[62] The misrepresentation of Steensma on the SEGM website constitutes a major violation of the scientific method and the accepted conventions of research.

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[57] AG Opinion, at 4.
[58] Alabama Law, Section 2(4).
[59] Steensma TD, McGuire JK, Kreukels BP, Beekman AJ, Cohen-Kettenis PT. Factors associated with desistence and persistence of childhood gender dysphoria: a quantitative follow-up study. J Am Acad Child Adolesc Psychiatry. 2013 Jun;52(6):582-90.
[60] Steensma TD, Cohen-Kettenis PT. A critical commentary on follow-up studies and "desistence" theories about transgender and gender non-conforming children. Int J Transgend. 2018 May; 19(2):225-30.
[61] See American Psychological Association (2015), p. 842 (noting that several studies categorized youth who did not return to the clinic after initial assessment as "desisters" who no longer identified with a gender different than sex assigned at birth; "As a result, this research runs a strong risk of inflating estimates of the number of youth who do not persist with a TGNC identity").
[62] Id.

Actual scientific evidence on the course of gender dysphoria emphasizes the importance of distinguishing between prepubertal children and adolescents. The evidence suggests that the course of dysphoria is more diverse for prepubertal children, and so it is critical to recognize them as a distinct population from adolescents. By referring to "children," the AG Opinion creates the misimpression that most or all children *and* teens diagnosed with dysphoria will cease identifying with the gender not assigned at birth. This is false.

The evidence suggests that the vast majority of adolescents who are diagnosed with gender dysphoria will persist in their gender identity and will benefit from gender-affirming medical care.[63] In a Dutch study, among 70 adolescents diagnosed with gender dysphoria and treated with puberty-suppressing hormones, 100% opted to continue with gender-affirming treatment.[64] A recent U.S. study found a consistent pattern. Following a large cohort of U.S. young people who reported some evidence of gender dysphoria but had not yet been formally diagnosed, the study found that adolescents were far more likely than prepubertal children to go on to a formal diagnosis of gender dysphoria and to receive gender-affirming treatment.[65]

The course of gender dysphoria is different in pre-pubertal children. For this group, the percentage of those whose dysphoria resolves without treatment is higher than for adolescents but likely lower than the AG Opinion's claimed 61-98% figure. When prepubertal children experience gender dysphoria, some will find that their dysphoria resolves before adolescence. That is, many of these children will not, as adolescents, identify as transgender or proceed with gender-affirming medical care. Importantly, as we have emphasized, standard medical protocols do not treat prepubertal children with drug therapy or genital surgery, and so there is zero risk that a prepubertal child with dysphoria will have received physical interventions.

Further, the AG Opinion's claim of 98% "desistance" is overstated even for prepubertal children. The Endocrine Society reports that, "[c]ombining all outcome studies to date, the [gender dysphoria]/gender incongruence of a minority of prepubertal children appears to persist

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[63] American Psychological Association (2015), p. 843; WPATH (2012), p. 11; Endocrine Society (2017). See also Turban JL, DeVries ALC, Zucker K. Gender Incongruence & Gender Dysphoria. In Martin A, Bloch MH, Volkmar FR (editors): Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook, Fifth Edition. Philadelphia: Wolters Kluwer 2018, pp. 20-21 ("we must recognize that [the existing studies of persistence] have been quite limited in power and generalizability and should not be misused to create barriers for TGD youth seeking gender-affirming care. The most relevant conclusions from these studies are that insistent cross-gender identification in adolescence most often correlates with persistent TGD identities in adulthood").

[64] de Vries et al. 2011, cited in note 43 ("None of the gender dysphoric adolescents in this study renounced their wish for [gender reassignment] during puberty suppression. This finding supports earlier studies showing that young adolescents who had been carefully diagnosed show persisting gender dysphoria into late adolescence or young adulthood").

[65] Wagner S, Panagiotakopoulos L, Nash R, Bradlyn A, Getahun D, Lash TL, Roblin D, Silverberg MJ, Tangpricha V, Vupputuri S, Goodman M. Progression of Gender Dysphoria in Children and Adolescents: A Longitudinal Study. Pediatrics. 2021 Jul;148(1):e2020027722. doi: 10.1542/peds.2020-027722. Epub 2021 Jun 7. PMID: 34099504; PMCID: PMC8276590. Wagner et. al (2021) studied this cohort for only (on average) 3.5 years; by the end of the study period, roughly 35% of teens but only about 15-18% of prepubertal children received a formal diagnosis of gender dysphoria. Note that these data do *not* establish that only 35% of teens *with gender dysphoria* persist in their diagnosis. This was not a population already diagnosed with dysphoria, and so the persistence rate cannot be calculated. Rather, Wagner et al. (2021) shows that, among a population with some evidence of dysphoria, adolescents are far more likely than young children to continue to a formal diagnosis.

in adolescence."[66] A reasonable summary of the literature would be that around 50% of prepubertal children diagnosed with gender dysphoria (using older, less stringent diagnostic criteria) will not persist in identifying as transgender into adolescence and adulthood.[67]

Recent evidence suggests that the spontaneous resolution of true gender dysphoria among prepubertal children is likely even lower. Earlier studies likely overstate the spontaneous resolution of gender dysphoria among children diagnosed before puberty, because their data incorporated broader diagnostic criteria.[68] That is, the studies likely included prepubertal children with gender variant behavior (e.g., boys with feminine interests or "tomboy" girls) alongside children who would meet today's diagnostic criteria for gender dysphoria – a deeply felt and lasting transgender identity with clinically significant distress and impaired functioning.[69] Consistent with this hypothesis is the recent finding that "the intensity of early dysphoria appears to be an important predictor" of the persistence of dysphoria into adolescence.[70] The evidence thus implies that, had the earlier studies focused on prepubertal children with intense gender dysphoria, the rates of spontaneous resolution of dysphoria would be lower.

To summarize, then, the key to the question of whether gender dysphoria persists over time is whether the patient is diagnosed with gender dysphoria in adolescence. (This might be a new diagnosis or it might be a persistent diagnosis from childhood.) Put plainly: *adolescents with gender dysphoria rarely find that their dysphoria resolves without treatment.*

"Rapid-onset" gender dysphoria. The AG Opinion also asserts that there has been a recent spike in gender dysphoria diagnosis and gender-affirming treatment among U.S. adolescents.[71] The AG insists that this is a "novel cohort" of youth and implies that their gender dysphoria is transient.[72]

As evidence, the AG Opinion again fails to consult reputable science and instead cites the SEGM website, which features a graph showing an increase from 2010 to 2020 in referrals of British adolescents to a specialized gender clinic.[73] The graph is calibrated to look as if the

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[66] Endocrine Society (2017). See Wallien MS, Cohen-Kettenis PT. Psychosexual outcome of gender-dysphoric children. J Am Acad Child Adolesc Psychiatry. 2008 Dec;47(12):1413-23. doi: 10.1097/CHI.0b013e31818956b9. PMID: 18981931.

[67] American Psychological Association (2015), pp. 841-2 ("existing research suggests that between 12% and 50% of children diagnosed with gender dysphoria may persist in their identification with a gender different than sex assigned at birth into late adolescence and young adulthood").

[68] See Temple Newhook J, Pyne J, Winters K, Feder S, Holmes C, Tosh J, Sinnott ML, Jamieson A, and Pickett S, A critical commentary on follow-up studies and "desistance" theories about transgender and gender-nonconforming children, International Journal of Transgenderism, vol. 19(2), pp. 212-224 (2018) doi: 10.1080/15532739.2018.1456390.

[69] Endocrine Society (2017).

[70] Steensma TD, McGuire JK, Kreukels BP, Beekman AJ, Cohen-Kettenis PT. Factors associated with desistence and persistence of childhood gender dysphoria: a quantitative follow-up study. J Am Acad Child Adolesc Psychiatry. 2013 Jun;52(6):582-90 (finding that "children with persistent GID are characterized by more extreme gender dysphoria in childhood than children with desisting gender dysphoria").

[71] AG Opinion, at 3 (stating that "the spike in [surgical and drug] procedures is a relatively recent development").

[72] AG Opinion, at 4.

[73] The AG Opinion cites to the website of the Society for Evidence-Based Gender Medicine (SEGM). SEGM's homepage provides an uncredited and unverifiable graph, which claims to depict referrals to an undefined term,

increase is very large, but in fact, the absolute numbers are small. The information depicted cannot be verified, because SEGM provides no citation. But taking the data at face value, in 2020 about 2600 children and teens sought treatment at the U.K. gender clinic. That is a very small percentage of Britain's child population. Further, the data appear to show only the number of children and adolescents referred for consultation; only a subset of these will ultimately be diagnosed with gender dysphoria and will continue with medical treatment.[74] The claimed "spike" in referrals certainly reflects the reduction in social stigma over the past decade and the expansion of care options.

By contrast, reliable recent data shows that, among high-school students, the percentage who identify as transgender is under 2% (1.8%).[75] These data come from the Centers for Disease Control's Youth Risk Behavior Surveillance System, which is the largest repository of data on self-reported behaviors in the United States. Because not all transgender people seek medical treatment, the percentage seeking medical care would be smaller.

The AG Opinion also repeats a discredited claim that a novel wave of "adolescent-onset gender dysphoria" is sweeping the U.S.[76] This statement echoes (without citing or quoting) a poor-quality study by Lisa Littman.[77] Littman's 2018 article contended that a novel pathology, "rapid-onset gender dysphoria" was leading teenagers to claim a transgender identity because of peer influence. WPATH, among other authorities, has taken a skeptical view of Littman's claim,[78] and the study has been criticized for serious methodological errors, including the use of parent reports instead of clinical data and the recruitment of its sample of parents from anti-transgender websites.[79] The journal of publication required an extensive correction of the

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"GIDS." SEGM [Internet]. c2020 [cited 2022 Apr 1]. Available from: https://segm.org/. Although GIDS is not defined on the SEGM site, it appears to refer to the Gender Identity Development Service, a specialized UK gender clinic for children and adolescents. GIDS [Internet]. c2022 [cited 2022 Apt 1]. Available from: https://gids.nhs.uk/about-us#main-content.

[74] A referral means that a medical provider (or, possibly, the patient) has suggested an appointment with GIDS. A referral does not equate to the receipt of gender-affirming care. See GIDS [internet]. Available from https://gids.nhs.uk/about-us#main-content.

[75] Johns MM, Lowry R, Andrzejewski J, Barrios LC, Demissie Z, McManus T, Rasberry CN, Robin L, Underwood JM. Transgender Identity and Experiences of Violence Victimization, Substance Use, Suicide Risk, and Sexual Risk Behaviors Among High School Students – 19 States and Large Urban School Districts, 2017. MMWR Morb Mortal Wkly Rep. 2019 Jan 25;68(3):67-71.

[76] AG Opinion, at 4.

[77] Littman L. Parent reports of adolescents and young adults perceived to show signs of a rapid onset of gender dysphoria. PLoS One. 2018 Aug 16;13(8):1-44; Littman L. Correction: Parent reports of adolescents and young adults perceived to show signs of a rapid onset of gender dysphoria. PLoS One. 2019 Mar 19;14(3):1-7.

[78] WPATH Global Board of Directors. WPATH Position on "Rapid-Onset Gender Dysphoria" [Internet]. 2018 Sep 4 [cited 2022 Apr 1]. Available from: https://www.wpath.org/media/cms/Documents/Public%20Policies/2018/9_Sept/WPATH%20Position%20on%20Rapid-Onset%20Gender%20Dysphoria_9-4-2018.pdf (stating that ROGD "constitutes nothing more than an acronym created to describe a proposed clinical phenomenon that may or may not warrant further peer-reviewed scientific investigation").

[79] Restar AJ. Methodological Critique of Littman's (2018) Parental-Respondents Accounts of "Rapid-Onset Gender Dysphoria". Arch Sex Behav. 2020 Jan;49(1):61-66. doi: 10.1007/s10508-019-1453-2 (hereinafter, "Restar 2020"); Temple Newhook, J, Pyne, J, Winters, K, Feder, S, Holmes, C, Tosh, J, and Pickett, S. A critical commentary on follow-up studies and "desistance" theories about transgender and gender-nonconforming children. *International Journal of Transgenderism*, *19*(2), 212-224. (2018).

original Littman article because of its misstatements.[80] Such a correction in reputable, peer-reviewed academic journals is taken only when a panel of experts, in retrospect, came to recognize the methodological flaws of the original study and concluded that it would be unscientific to allow the originally published findings to stand.

Littman's hypothesis that rapid-onset gender dysphoria exists as a distinct condition has not been supported by studies of clinical data.[81] Neither the American Psychiatric Association nor any other reputable professional organization has recognized rapid-onset gender dysphoria as a distinct clinical condition or diagnosis.[82]

Section 3. The AG Opinion and the Alabama Law greatly exaggerate the risks of gender-affirming drug therapy.

The AG Opinion claims that "sex change procedures," including surgery and drug therapies "often ha[ve] the effect of permanently sterilizing those minor children."[83] The Alabama Law makes similar claims.[84] Section 1 of this report has established that the AG Opinion's claim with respect to surgery is false: current medical protocols state that individuals must be the age of majority or older before undergoing surgery on genitals or reproductive organs. In this Section, we focus on the AG Opinion's (and Alabama Law's) claims regarding the medical effects of drug treatment for transgender adolescents.

a. The AG Opinion and the Alabama Law greatly overstate the risks of puberty-blocking medication and incorrectly state that it results in sterilization.

The Texas Attorney General claims that "[t]here is insufficient medical evidence available to demonstrate that discontinuing [puberty-blocking] medication resumes a normal puberty process."[85] The Alabama Law contains similar statements.[86] The claim is false: puberty-blocking medication has been shown to be safe, effective, and fully reversible.

As noted in Section 1 of this report, puberty-blocking medication (gonadotropin-releasing hormone agonists, or GnRHa's) can be part of a staged approach to gender-affirming care for

[80] Littman L. Correction: Parent reports of adolescents and young adults perceived to show signs of a rapid onset of gender dysphoria. PLoS One. 2019 Mar 19;14(3):1-7 (altering the original article to, inter alia, clarify that the article collected no data from adolescents or clinicians and generates only a hypothesis for further exploration).
[81] Bauer GR, Lawson ML, Metzger DL; Trans Youth CAN! Research Team. Do Clinical Data from Transgender Adolescents Support the Phenomenon of "Rapid Onset Gender Dysphoria"? J Pediatr. 2022 Apr; 243:224-227. See also Arnoldussen M, Steensma TD, Popma A, van der Miesen AIR, Twisk JWR, de Vries ALC. Re-evaluation of the Dutch approach: are recently referred transgender youth different compared to earlier referrals? Eur Child Adolesc Psychiatry. 2020 Jun;29(6):803-811. Erratum in: Eur Child Adolesc Psychiatry. 2020 Dec 16 (concluding that there has been no marked change in the characteristics of the population of adolescents referred for gender dysphoria from 2000 to 2016; the authors hypothesize that the increase in number of referrals reflects the increasing social acceptability of seeking treatment).
[82] Restar (2018), cited in note 79.
[83] AG Opinion, at 2-3. The AG Opinion repeats its claim about sterilization. Id. at 5 ("The surgical and chemical procedures you ask about can and do cause sterilization.")
[84] Alabama Law, Sections 2(9), 2(11), 2(12), 2(13) and 2(14).
[85] AG Opinion, at 5.
[86] Alabama Law, Sections 2(7), (11), (12) and (13).

adolescents. By stalling pubertal maturation, the medication relieves adolescents of the intense gender dysphoria that can accompany pubertal development along the pathway of their assigned sex. During this pause, the adolescent is given time to confirm their gender identity and to consider the need for appropriate gender-affirming hormone therapy without having had their body mature along pubertal path incongruent with their gender identity. Adolescents who continue to identify as transgender will be able to proceed with gender-affirming hormone therapy when they, their parents, and their providers determine that treatment is medically appropriate. Puberty blockers not only alleviate gender dysphoria in adolescence but have beneficial lifelong effects on dysphoria and can minimize the need for subsequent treatments, including surgery in adulthood. In the unlikely event that a teen realizes that they identify as cisgender, they can discontinue the blocker and spontaneous pubertal maturation will resume.

The scientific evidence clearly shows that treatment with puberty blockers is fully reversible. GnRHa therapy has been used since the 1980's in children with precocious puberty, and a solid body of evidence documents that pubertal progression stops with drug therapy and that spontaneous pubertal development occurs after discontinuation of the medication.[87]

Recent studies suggest that puberty-blocking medication has negligible or small effects on bone development in adolescents, and any negative effects are temporary and reversible. The most recent studies show that puberty-blocking drug therapy either has no effect on bone mineral density (BMD), a proxy measure of bone strength, or is associated with a very small decrease.[88]

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[87] Manasco PK, Pescovitz OH, Feuillan PP, Hench KD, Barnes KM, Jones J, Hill SC, Loriaux DL, Cutler Jr GB. Resumption of puberty after long term luteinizing hormone-releasing hormone agonist treatment of central precocious puberty. J Clin Endocrinol Metab. 1988 Aug 1;67(2):368-72; Heger S, Muller M, Ranke M, Schwarz H, Waldhauser F, Partsch C, Sippell WG. Long-term GnRH agonist treatment for female central precocious puberty does not impair reproductive function. Mol Cell Endocrinol. 2006 Jul 25;254-255:217-220; Feuillan PP, Jones JV, Barnes K, Oerter-Klein K, Cutler Jr GB. Reproductive Axis after Discontinuation of Gonadotropin-Releasing Hormone Analog Treatment of Girls with Precocious Puberty: Long Term Follow-Up Comparing Girls with Hypothalamic Hamartoma to Those with Idiopathic Precocious Puberty. J Clin Endocrinol Metab. 1999 Jan;84(1):44-49; Bertelloni S, Baroncelli GI, Ferdeghini M, Menchini-Fabris F, Saggese G. Final height, gonadal function and bone mineral density of adolescent males with central precocious puberty after therapy with gonadotropin-releasing hormone analogues. Eur J Pediatr. 2000 May;159(5):369-74 (hereinafter, "Bertelloni et al (2000)"); Bertelloni S, Mul D. Treatment of central precocious puberty by GnRH analogs: long-term outcome in men. Asian J Androl. 2008 Jul;10(4):525-34; Luo X, Liang Y, Hou L, Wu W, Ying Y, Ye F. Long-term efficacy and safety of gonadotropin-releasing hormone analog treatment in children with idiopathic central precocious puberty: A systematic review and meta-analysis. Clin Endocrinol. 2021 May; 94(5):786-96.

[88] Klink D, Caris M, Heijboer A, van Trotsenburg M, Rotteveel J. Bone mass in young adulthood following gonadotropin-releasing hormone analog treatment and cross-sex hormone treatment in adolescents with gender dysphoria. J Clin Endocrinol Metab. 2015 Feb;100(2):E270-75 (hereinafter, "Klink et al. 2015"); Schagen SEE, Wouters FM, Cohen-Kettenis PT, Gooren LJ, Hannema SE. Bone Development in Transgender Adolescents Treated With GnRH Analogues and Subsequent Gender-Affirming Hormones. J Clin Endocrinol Metab. 2020 Dec 1;105(12): e4252-e4263 (hereinafter, Schagen et al. 2020"); Delemarre-van de Waal HA, Cohen-Kettenis PT. Clinical management of gender identity disorder in adolescents: a protocol on psychological and paediatric endocrinology aspects. Eur J Endocrinol. 2006;155:S131-S137. Studies of children treated for precocious puberty found that BMD was normal at final height attainment. Alessandri SB, Pereira F de A, Villela RA, Antonini SRR, Elias PCL, Martinelli Jr CE, de Castro M, Moreira AC, de Paula FJA. Bone mineral density and body composition in girls with idiopathic central precocious puberty before and after treatment with a gonadotropin-releasing hormone agonist. Clinics (Sao Paulo). 2012;67(6):591-96; Antoniazzi F, Zamboni G, Bertoldo F, Lauriola S, Mengarda F, Pietrobelli A, Tato L. Bone mass at final height in precocious puberty after gonadotropin-releasing hormone agonist with and without calcium supplementation. J Clin Endocrinol Metab. 2003 Mar;88(3):1096-1101 (hereinafter,

Calcium supplementation has been shown to protect patients from bone loss.[89] Critically, any reduction in BMD is recovered when adolescents cease taking puberty-blocking medication, whether or not they continue to gender-affirming hormone therapy.[90]

Tellingly, the AG Opinion does not cite scientific evidence for its claim regarding "insufficient medical evidence"[91] Instead, it cites two legal cases, neither of which contains sound scientific evidence on this subject.[92] One of the cited cases is irrelevant, because it involves legal claims about surgery, not puberty blockers.[93] The other cited case, Bell v. Tavistock and Portman NHS Foundation Trust (2020), was reversed on appeal in the U.K. in 2021 because the decision relied on biased and inexpert scientific testimony.[94]

The AG Opinion also attacks puberty blockers by claiming that their use "is not approved by the federal Food and Drug Administration and is considered an 'off-label' use of the medications."[95] The Alabama Law makes a similar claim.[96] The implication is that off-label use of medication is harmful, but this claim is unfounded.

"Antoniazzi et al. (2003)"); Heger S, Partsch CJ, Sippell WG. Long-term outcome after depot gonadotropin-releasing hormone agonist treatment of central precocious puberty: final height, body proportions, body composition, bone mineral density, and reproductive function. J Clin Endocrinol Metab. 1999 Dec;84(12):4583-90; Neely EK, Bachrach LK, Hintz RL, Habiby RL, Slemenda CW, Feezle L, Pescovitz OH. Bone mineral density during treatment of central precocious puberty. J Pediatr. 1995 Nov;127(5):819-22.

[89] Antoniazzi et al. (2003), cited in note 88.

[90] Klink et al. (2015), cited in note 88; Schagen et al. (2020), cited in note 88. Bertelloni et al. (2000), cited in note 87; Pasquino AM, Pucarelli I, Accardo F, Demiraj V, Segni M, Di Nardo R. Long-term observation of 87 girls with idiopathic central precocious puberty treated with gonadotropin-releasing hormone analogs: impact on adult height, body mass index, bone mineral content, and reproductive function. J Clin Endocrinol Metab. 2008 Jan;93(1):190-195; Magiakou MA, Manousaki D, Papadaki M, Hadjidakis D, Levidou G, Vakaki M, Papaefstathiou A, Lalioti N, Kanaka- Gantenbein C, Piaditis G, Chrousos GP, Dacou-Voutetakis C. The efficacy and safety of gonadotropin-releasing hormone analog treatment in childhood and adolescence: a single center, long-term follow-up study. J Clin Endocrinol Metab. 2010 Jan;95(1):109-17; Bertelloni S, Baroncelli GI, Sorrentino MC, Perri G, Saggese G. Effect of central precocious puberty and gonadotropin-releasing hormone analogue treatment on peak bone mass and final height in females. Eur J Pediatr. 1998 May;157(5):363-67.

[91] AG Opinion, at 5.

[92] The AG Opinion's citation is "see generally Hennessy-Waller v. Snyder, 529 F. Supp. 3d 1031, 1042 (D. Ariz. 2021), citing Bell v. Tavistock and Portman NHS Foundation Trust, 2020 EWHC 3274, para. 134 (Dec. 1, 2020) (referring to Bell's conclusion that a clinic's practice of prescribing puberty-suppressing medication to individuals under age 18 with gender dysphoria and determining such treatment was experimental)." Id. at 5-6.

[93] Hennessy-Waller is a decision that denies a motion for preliminary injunction against an insurance company for failure to cover gender-affirming surgery. The decision involves surgery, not puberty blockers, and it is not a fully-adjudicated factual determination about either surgery or puberty blockers. Hennessy-Waller v. Snyder, 529 F. Supp. 3d 1031 (D. Ariz. 2021).

[94] Bell v. The Tavistock and Portman NHS Foundation Trust [2021] EWCA (Civ) 1363 [38] (Eng.) (noting that the claimant's (plaintiff's) expert evidence was faulty: "None of it complied with the rules regarding expert evidence and a good deal of it is argumentative and adversarial."). For a scientific review of the evidence in the lower court decision, see de Vries ALC, Richards C, Tishelman AC, Motmans J, Hannema SE, Green J, Rosenthal SM. Bell v Tavistock and Portman NHS Foundation Trust [2020] EWHC 3274: Weighing current knowledge and uncertainties in decisions about gender-related treatment for transgender adolescents. Int J Transgend Health. 2021 Apr 5;22(3):217-24.

[95] AG Opinion, at 5.

[96] Alabama Law, Section 2(7).

"Off label" means only that the FDA has not specifically approved a particular medication for a particular use. The off-label use of medications for children is quite common and often necessary, because an "overwhelming number of drugs" have no FDA-approved instructions for use in pediatric patients.[97] This is in part because pharmaceutical companies often lack financial incentives to support research required for FDA approval for specific use in children.[98] Indeed, the American Academy of Pediatrics specifically approves the off-label use of drugs:

> The purpose of off-label use is to benefit the individual patient. Practitioners use their professional judgment to determine these uses. As such, *the term "off-label" does not imply an improper, illegal, contraindicated, or investigational use*. Therapeutic decision-making must always rely on the best available evidence and the importance of the benefit for the individual patient.[99]

Many common medications, including hormones, are used off-label in adults and minors. In fact, pediatricians prescribe off-label drugs in 20% of patient visits.[100] Estrogen and testosterone are often used off-label to treat adolescents with intersex conditions. Common hormonal medications used off-label include norethindrone, a progesterone analogue used off-label for the treatment of heavy menstrual bleeding in those with polycystic ovarian syndrome, bleeding disorder, and anovulatory bleeding of early puberty. It is also used to treat endometriosis, which is a painful inflammatory condition. Many forms of combined hormonal contraception, as well as a testosterone-blocking medication (spironolactone), are used off-label to treat acne. Other examples include clonidine, a blood pressure medication used off-label for the treatment of ADHD, migraine headaches, disorders of behavioral regulation, and insomnia; and propranolol, a blood pressure medication used off-label for the treatment of performance anxiety.

> b. The AG Opinion and the Alabama Law exaggerate the fertility risks of gender-affirming hormonal treatment.

[97] The quote is from the American Academy of Pediatrics Committee on Drugs. See Frattarelli DA, Galinkin JL, Green TP, Johnson TD, Neville KA, Paul IM, Van Den Anker JN; American Academy of Pediatrics Committee on Drugs. Off-label use of drugs in children. Pediatrics. 2014 Mar;133(3):563-7 (hereinafter, "AAP Committee on Drugs (2014)"); see also Allen HC, Garbe MC, Lees J, Aziz N, Chaaban H, Miller JL, Johnson P, DeLeon S. Off-Label Medication use in Children, More Common than We Think: A Systematic Review of the Literature. J Okla State Med Assoc. 2018 Oct;111(8):776-783.

[98] AAP Committee on Drugs (2014), cited in note 97.

[99] AAP Committee on Drugs (2014), cited in note 97 (emphasis added). See also Schrier L, Hadjipanayis A, Stiris T, Ross-Russell RI, Valiulis A, Turner MA, Zhao W, De Cock P, de Wildt SN, Allegaert K, van den Anker J. Off-label use of medicines in neonates, infants, children, and adolescents: a joint policy statement by the European Academy of Paediatrics and the European society for Developmental Perinatal and Pediatric Pharmacology. Eur J Pediatr. 2020 May;179(5):839-847.

[100] Hoon D, Taylor MT, Kapadia P, Gerhard T, Strom BL, Horton DB. Trends in Off-Label Drug Use in Ambulatory Settings: 2006-2015. Pediatrics. 2019 Oct;144(4):1-10 (emphasis added).

The AG Opinion claims that gender-affirming hormone treatments cause infertility.[101] The Alabama Law contains a similar statement.[102] These are unwarranted exaggerations, which ignore the substantial evidence of reversibility of the fertility effects of hormone therapy.

Treatment with gender-affirming sex hormones impacts fertility while drug therapy is ongoing, but the effect is anticipated to be reversible if medication is discontinued. Importantly, hormone therapy is always individualized, and some transgender and non-binary teens remain on puberty blockers up to the age of majority without proceeding to hormone treatment.

For transgender men (persons assigned female sex at birth who retain ovaries), testosterone treatment can affect ovarian function, inhibiting menses in the majority of those on therapy. The evidence shows that most transgender men who had regular menses before starting testosterone therapy are reported to resume menses if testosterone is discontinued.[103] Some transgender men may retain fertility during hormone treatment: spontaneous pregnancies have occurred in testosterone-treated transgender men, some while still amenorrheic.[104] Further, a number of transgender men have discontinued testosterone therapy prior to undergoing assisted reproductive technology and have carried pregnancies to term with delivery of normal infants.[105]

The effects of gender-affirming estrogen treatment on testicular histology vary among individuals. Reduced spermatogenesis is common while patients remain on estrogen, but fully normal spermatogenic activity has been documented.[106] Importantly, return of spermatogenesis occurred quickly in patients who discontinued hormone treatment.[107] Patients who were treated with puberty blockers (GnRHa's) starting at the onset of pubertal development and estrogen at

[101] AG Opinion, at 3.
[102] Alabama Law, Section 2(13).
[103] Endocrine Society (2017). Light AD, Obedin-Maliver J, Sevelius JM, Kerns JL. Transgender men who experienced pregnancy after female-to-male gender transitioning. *Obstet Gynecol.* 2014;124(6):1120–1127 (hereinafter, "Light et al. 2014"); Pelusi C, Costantino A, Martelli V, et al. Effects of three different testosterone formulations in female-to-male transsexual persons. *J Sex Med.* 2014;11(12):3002–3011.; Smith KP, Madison CM, Milne NM. Gonadal suppressive and cross-sex hormone therapy for gender dysphoria in adolescents and adults. *Pharmacotherapy.* 2014;34(12):1282–1297.
[104] Light et al. (2014), cited in note 103; Light A, Wang LF, Zeymo A, Gomez-Lobo V. Family planning and contraception use in transgender men. Contraception. 2018 Oct;98(4):266-69.
[105] Leung A, Sakkas D, Pang S, Thornton K, Resetkova N. Assisted reproductive technology outcomes in female-to-male transgender patients compared with cisgender patients: a new frontier in reproductive medicine. Fertil Steril. 2019 Nov;112(5):858-65; Wallace SA, Blough KL, Kondapalli LA. Fertility preservation in the transgender patient: expanding oncofertility care beyond cancer. Gynecol Endocrinol. 2014;30(12):868-71; Maxwell S, Noyes N, Keefe D, Berkeley AS, Goldman KN. Pregnancy outcomes after fertility preservation in transgender men. Obstet Gynecol. 2017 Jun;129(6):1031-34.; Gale J, Magee B, Forsyth-Greig A, Visram H, Jackson A. Oocyte cryopreservation in a transgender man on long-term testosterone therapy: a case report. F S Rep. 2021 Feb 20;2(2):249-51.
[106] Schneider F, Kliesch S, Schlatt S, Neuhaus N. Andrology of male -to-female transsexuals: influence of cross-sex hormone therapy on testicular function. Andrology. 2017 Sept;5(5):873-80.
[107] Schneider F, Neuhaus N, Wistuba J, Zitzmann M, Heß J, Mahler D, van Ahlen H, Schlatt S, Kliesch S. Testicular functions and clinical characterization of patients with gender dysphoria (GD) undergoing sex reassignment surgery (SRS). J Sex Med. 2015 Nov;12(11):2190-2200.

16 years of age were shown to have normal-appearing, immature sperm-producing cells in the testes, suggesting those individuals retained fertility potential.[108]

As with any other medical decision, parents and providers carefully weigh the risks of treating the individual adolescent against the risks of not treating them, including the mental health impact and potential suicide risk of not beginning gender-affirming care.

As the standard protocols summarized in Section 1 of this report demonstrate, there is no push by physicians to proceed to hormone therapy. On the contrary, the decision to proceed with drug therapy and the choice of therapy are determined after assessing each adolescent's medical history as well as their past and ongoing mental health concerns. The standard of care specifically states that any existing mental health issues must be stable prior to moving forward with gender-affirming medical interventions. When counseling transgender adolescents who are considering gender-affirming drug therapy, physicians can also offer sperm or oocyte (egg) cryopreservation.

In addition to its claims about fertility, the AG Opinion offers a list of asserted medical harms without citation to any existing medical authority. The cited source is a healthcare website, and the underlying document has been removed from the site and is not otherwise available on the Internet.[109] The opinion offers no scientific foundation for its claims but seems to conflate long-outdated practice with the current standard of care.[110]

A more accurate perspective begins with an understanding of the role of hormones in the body. Hormones play a role in determining the medical profile of cisgender people. Generally speaking, cisgender women have relatively higher levels of estrogen and lower levels of testosterone, and cisgender men have the reverse. Each hormonal profile carries with it medical benefits and risks. Cisgender women, for example, have lower rates of cardiovascular disease than cisgender men but higher risks of venous thromboembolism. When a transgender individual receives gender-affirming hormone treatment, they take doses of exogenous sex hormones that approximate the physiologic state of their identified gender. Put simply, a transgender female is supplied an amount of estrogen similar to the estrogen that a cisgender woman's ovaries typically produce. Similarly, a transgender male receives a dose of testosterone that approximates what a cisgender male's testicles typically produce. Protocols provide explicit dosage guidelines to approximate the physiology of the patient's identified gender rather than to develop desired physical characteristics.

The medical result is that transgender individuals move toward the typical medical profile of their identified gender. And so transgender women, like cisgender women, have lower risks of

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[108] de Nie I, Mulder CL, Meißner A, Schut Y, Holleman EM, van der Sluis WB, Hannema SE, den Heijer M, Huirne J, van Pelt AMM, van Mello NM. Histological study on the influence of puberty suppression and hormonal treatment on developing germ cells in transgender women. Hum Reprod. 2022 Jan 28;37(1):297-308.

[109] The AG Opinion cites to Timothy Cavanaugh, M.D., Cross-Sex Hormone Therapy, FENWAY HEALTH (2015), https://www.lgbtqiahealtheducation.org/wp-content/uploads/Cross-Sex-Hormone-Therapy1.pdf. A search conducted in March 2022 found that the link was broken and the document could not be found on the Fenway Health website or elsewhere on the Internet.

[110] The iatrogenic (drug-induced) risks of hepatotoxicity, meningioma, and prolactinoma are now zero, because the medication associated with those risks (cyproterone) is no longer in use in the United States. WPATH (2012), p. 48.

cardiovascular disease than cisgender men.[111] Transgender women, like cisgender women, have a slightly higher risk of venous thromboembolism than cisgender men. In fact, transgender women have a *lower* risk of venous thromboembolism than cisgender women, and the overall risk is extremely low (less than 1%) for all transgender individuals, both women and men.[112] The risk of venous thromboembolism in transgender women and non-pregnant cisgender women is less than the risk in pregnancy, which is the highest estrogenic physiologic state known.

It is also critical to note that the medical impact of gender-affirming treatment is generally the same in transgender people as in cisgender people who take the same hormone medications. For example, physicians commonly prescribe hormonal contraceptives containing ethinyl estradiol (a synthetic estrogen) to adolescents for reasons including birth control, management of irregular or painful menstrual periods, and acne. In other words, similar doses of exogenous sex hormones are commonly administered to cisgender individuals for a host of reasons and are well tolerated.

[111] Connelly PJ, Marie Freel E, Perry C, Ewan J, Touyz RM, Currie G, Delles C. Gender-Affirming Hormone Therapy, Vascular Health and Cardiovascular Disease in Transgender Adults. Hypertension. 2019 Dec;74(6):1266-1274. doi: 10.1161/HYPERTENSIONAHA.119.13080. Epub 2019 Oct 28. Erratum in: Hypertension. 2020 Apr;75(4):e10. PMID: 31656099; PMCID: PMC6887638.

[112] Oral estradiol, the preferred estrogen formulation that is given to transgender women in the United States, carries a VTE risk of <1%. T'Sjoen G, Arcelus J, Gooren L, Klink DT, Tangpricha V. Endocrinology of Transgender Medicine. Endocr Rev. 2019 Feb 1;40(1):97-117. In transgender men, the overall risk of VTE ranges from 0% to 0.34%. Maraka S, Singh Ospina N, Rodriguez-Gutierrez R, Davidge-Pitts CJ, Nippoldt TB, Prokop LJ, Murad MH. Sex Steroids and Cardiovascular Outcomes in Transgender Individuals: A Systematic Review and Meta-Analysis. J Clin Endocrinol Metab. 2017 Nov 1;102(11):3914-23.

Appendix A: Additional Information on Biased Sources of Information in the AG Opinion

Here, we address two sources of information mischaracterized by the AG Opinion as authorities on, respectively, science and medical ethics.

a. The Society for Evidence-Based Gender Medicine

The AG Opinion twice cites the Society for Evidence-Based Gender Medicine ("SEGM"). SEGM claims to be "an international group of over 100 clinicians and researchers concerned about the lack of quality evidence for the use of hormonal and surgical interventions as first-line treatment for young people with gender dysphoria."[113]

Despite SEGM's statement, the group appears to be nothing more than a website; it does not appear to hold meetings, screen its members, or publish a journal. The original content on the website includes statements unsupported by any citations. When the content does provide citations, they are often unreliable or misleading. The SEGM website includes a list of citations to more than 100 articles as evidence for the medical risks of gender-affirming care, but we reviewed each article and found the vast majority to be of low quality. The site's content omits mention of the standards of care published by mainstream scientific organizations, and it falsely claims that the standard protocols permit gender-affirming surgery before the age of majority. The long list of citations omits mainstream scientific articles that do not support the SEGM agenda, and the list includes a large number of letters to the editor, which are not peer-reviewed or fact-checked,[114] as well as other sources of little scientific value, including opinion pieces and case studies.

Although the SEGM site claims "over 100 clinicians and researchers" as members, it lists as "clinical and academic advisors" a group of only 14 people, many of whom have limited (or no) scientific qualifications related to the study of medical treatment for transgender people. Of the 14, only eight claim academic credentials above the master's degree level (and, of these, two of the PhD's are in sociology and evolutionary biology). None have academic appointments in pediatric medicine or child psychology; none have published original empirical research on the medical treatment of transgender people in a peer-reviewed publication; and none currently treat patients in a recognized gender clinic.[115]

A contextual examination reveals that SEGM is an ideological organization without apparent ties to mainstream scientific or professional organizations. Its 14 core members are a small group of repeat players in anti-trans activities – a fact that the SEGM website does not disclose. These 14 often write letters to the editor of mainstream scientific publications; these letters appear in the list of publications on the website (even though letters to the editor typically are not peer-reviewed or fact-checked). (Our review shows that the group of 14 has a total of 39 relevant publications and that 75% of these are letters to the editor.)

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[113] All SEGM.org website citations reflect visits to the site in March 2022.
[114] Of the 123 listed papers (some are listed more than once), 49 (or 40%) are letters to the editor or opinion pieces.
[115] These findings are based on the biographical data posted on the SEGM.org website, supplemented with searches of Google (to determine academic appointments and listed publications) and the database PubMed (to determine medical publication records).

The core members of SEGM frequently serve together on the boards of other organizations that oppose gender-affirming treatment and, like SEGM, feature biased and unscientific content. These include Genspect, Gender Identity Challenge (GENID), Gender Health Query, Rethink Identity Medicine Ethics, Sex Matters, Gender Exploratory Therapy Team, Gender Dysphoria Working Group, and the Institute for Comprehensive Gender Dysphoria Research.

b. Purported bioethics experts

The AG Opinion cites two purported ethics experts for the proposition that "it is particularly unethical to radically intervene in the normal physical development of a child to 'affirm' a 'gender identity' that is at odds with bodily sex."[116]

This is an unreliable citation for two reasons. First, the cited item is not published in a peer-reviewed or mainstream legal or ethics journal. It appears, instead, in *Public Discourse*, an online journal on the website of an organization with no clear academic or professional affiliation.[117] Second, the two authors have strong ties to anti-trans activism. The first author, Ryan T. Anderson, is the president of a right-wing, Catholic-identified think tank. [118] (Anderson is also the founder of the publishing journal, *Public Discourse*, further undermining the credibility of the citation.) The second author, Robert George, is a professor at Princeton who has long been engaged in anti-trans political activism. George is the founder of The American Principles Project, which states: "We want to impose a political cost on the Left's anti-family extremism. If they want to attack parental rights [or] confuse young children about their gender…they are going to be punished at the polls."[119]

By contrast, academic experts in bioethics consider gender-affirming treatment to be ethical.[120] They emphasize "the importance of balanced decision making when counseling and

[116] AG Opinion, at 4 (citing Anderson RT, George RP. Physical Interventions on the Bodies of Children to "Affirm" their "Gender Identity" Violate Sound Medical Ethics and Should Be Prohibited [Internet]. Public Discourse: The Journal of the Witherspoon Institute; 2019 Dec 8 [cited 2022 Mar]. Available from: https://www.thepublicdiscourse.com/2019/12/58839/.

[117] "*Public Discourse* is the online journal of the Witherspoon Institute, a 501(c)3 research center located in Princeton, New Jersey". Our Mission. Public Discourse: The Journal of the Witherspoon Institute; c2022 [cited 2022 Mar]. Available from: https://www.thepublicdiscourse.com/our-mission/.

[118] "Founded in 1976, the Ethics and Public Policy Center" works "to apply the riches of the Judeo-Christian tradition to contemporary questions of law, culture, and politics, in pursuit of America's continued civic and cultural renewal." About. Ethics & Public Policy Center; c2022 [cited 2022 Mar]. Available from: https://eppc.org/about/. The EPPC's programs include "Catholic Studies" and the "Catholic Women's Forum. Programs. Ethics & Public Policy Center; c2022 [cited 2022 Mar]. Available from: https://eppc.org/program/. Anderson is listed as the president. Ryan T. Anderson. Ethics & Public Policy Center; c2022 [cited 2022 Mar]. Available from: https://eppc.org/author/ryan_anderson/.

[119] About. American Principles Project; c2020 [cited 2022 Mar]. Available from: https://americanprinciplesproject.org/about/. On another page, the website states that the American Principles Project was founded in 2009 by George and "veteran political strategist Frank Cannon." History. American Principles Project; c2020 [cited 2022 Mar]. Available from: https://americanprinciplesproject.org/about/history-story/.

[120] For examples, see Kimberly LL, Folkers KM, Friesen P, Sultan D, Quinn GP, Bateman-House A, Parent B, Konnoth C, Janssen A, Shah LD, Bluebond-Langner R, Salas-Humara C. Ethical Issues in Gender-Affirming Care for Youth. Pediatrics. 2018 Dec;142(6):e20181537; Bizic MR, Jeftovic M, Pusica S, Stojanovic B, Duisin D,

treating adolescents with nonconforming gender identities,"[121] and they have evaluated decision-making procedures that can ensure that adolescents and their parents give fully-informed consent to treatment.[122] These considerations align with the consent processes prescribed by standard medical protocols, which we discuss in Section 1.

Vujovic S, Rakic V, Djordjevic ML. Gender Dysphoria: Bioethical Aspects of Medical Treatment. BioMed Res Int. 2018 Jun 13;2018:9652305; Strang JF, Powers MD, Knauss M, Sibarium E, Leibowitz SF, Kenworthy L, Sadikova E, Wyss S, Willing L, Caplan R, Pervez N, Nowak J, Gohari D, Gomez-Lobo V, Call D, Anthony LG. "They Thought It Was an Obsession": Trajectories and Perspectives of Autistic Transgender and Gender-Diverse Adolescents. J Autism Dev Disord. 2018 Dec;48(12):4039-55.

[121] Steensma TD, Wensing-Kruger SA, Klink DT. How Should Physicians Help Gender-Transitioning Adolescents Consider Potential Iatrogenic Harms of Hormone Therapy? AMA J Ethics. 2017 Aug 1;19(8):762-70.

[122] Vrouenraets LJJJ, Hartman LA, Hein IM, de Vries ALC, de Vries MC, Molewijk BAC. Dealing with Moral Challenges in Treatment of Transgender Children and Adolescents: Evaluating the Role of Moral Case Deliberation. Arch Sex Behav. 2020 Oct;49(7):2619-34.