



# Pediatric Research and Health Care for Transgender and Gender Diverse Adolescents and Young Adults: Improving (Biopsychosocial) Health Outcomes

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## ABSTRACT

Adolescent and young adult (AYA) transgender health care and research have expanded rapidly in the United States and abroad, but the effects of gender-affirming social, hormonal, or surgical care on overall health remain unclear. Gender diverse identities, also termed nonbinary, have often been neglected in favor of (male/female) binary identities, even in the context of transgender health care and research. No high quality studies have assessed how gender-affirming medical care impact health inequities in transgender and gender diverse (TG/GD) adults, much less in AYAs, despite the fact that that TG/GD adults have higher than average morbidity and mortality across a host of health concerns, from human immunodeficiency virus infection to thromboembolism, and that reported depression with suicidal ideation is >10 times higher in TG/GD adults than in the general population.

TG/GD youth have related but different needs from TG/GD adults. TG/GD AYA are embedded in family and schools, where stigma may be difficult to escape; mental health during adolescence has areas of increased risk as well as resilience; and the effects of early hormonal and surgical interventions on long-term health are insufficiently studied. Because of this, an

inclusive and proactive approach to addressing the needs of TG/GD AYA by pediatric clinicians, researchers, and educators is particularly crucial.

This article focuses on what is known and unknown about clinical practice, research, and education related to TG/GD health. We highlight the role of gender affirmation by clinicians as they care and advocate for TG/GD AYAs; the potential challenges of hormonal treatment for peripubertal youth; and short- and long-term effects on physical and reproductive health of medical or surgical interventions. We also discuss how social context influences knowledge gaps and the health-relevant risks faced by TG/GD AYA. The challenges are formidable, but opportunities await: high priority research questions to explore, educational gaps to be filled, and advocacy that needs the voices of pediatricians to promote policies to facilitate positive health outcomes for TG/GD AYA.

**KEYWORDS:** adolescent health; transgender; underserved populations

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INDIVIDUALS WHO IDENTIFY as transgender or gender diverse (TG/GD) are increasingly seeking health care to achieve a physical state congruent with their affirmed gender identity. Access to gender-affirming health care is limited by many factors, including a dearth of providers with TG/GD expertise,<sup>1</sup> insufficient health insurance coverage, and stigmatization of TG/GD patients.<sup>2</sup> Even when TG/GD patients find gender-affirming care, limited research guides delivery of optimal care. Previously, government-funded agencies' definitions of historically underrepresented groups have not included TG/GD people; and TG/GD people have historically been excluded even in larger scale efforts for Lesbian, Gay,

Bisexual, Transgender, Questioning/Queer (LGBTQ) equality. Recently increased medical awareness, coupled with changes to related funding priorities, has spurred the proliferation of research focusing on the TG/GD community.<sup>3</sup> Many questions remain unanswered, and new questions are emerging.

TG/GD adolescents and young adults (AYA) represent a small but growing portion of the larger TG/GD community, in which adults have received the most attention in biomedical research studies.<sup>4</sup> Delaying gender-affirming medical care until adulthood was once the norm, but new evidence suggests that earlier social, hormonal, and/or surgical affirming care during adolescence improves psychosocial outcomes,<sup>5</sup>

including attainment of higher education, employment, and reliable housing; and decreased suicidality.<sup>2,6</sup>

Gender dysphoria is the emotional discomfort that can exist when one's gendered sense of self is incongruent with the sex assigned at birth. Many treatments specifically focus on reducing gender dysphoria to improve patients' quality of life. Existing adult-derived treatment protocols for social, hormonal, and surgical affirmative care for AYA patients' needs evidence-based adaptations for those approaching and undergoing puberty, particularly addressing the special issues of supporting AYA emotional health and long-term well-being.<sup>4</sup> We do not fully understand the effects of medical treatment on most developmental and maturational issues, including brain development, fertility, cardiometabolic health, and cancer risk.<sup>7,8</sup> Moreover, as patients seek to bring their bodies into alignment with their gender identities, the potentially profound effects on biopsychosocial well-being are also understudied. Evidence-based knowledge about these multifaceted health impacts is needed to guide both medical education and health policy.

The biopsychosocial model provides a framework for our discussion of TG/GD AYA's health care needs. This model posits that all patients exist within spheres of influence that define their biological, psychological, and social needs, and that health care must recognize and address all 3 of these elements of health.<sup>9</sup> Clinical care and research questions for TG/GD AYA patients should combine the expertise of the biological as well as the psychosocial sciences. Finally, we will discuss policy and advocacy throughout and identify opportunities in the final section.

## INCLUSIVE APPROACHES TO CLINICAL CARE IN THE PEDIATRIC SETTING

### CHILDHOOD GENDER DIVERSITY AND EARLY SUPPORT FOR TG/GD YOUTH

Prior research in cisgender children has shown that most have solidified their gender identity by the age of 3 or 4 years and communicate this identity through clothing, toy preferences, and verbal expressions of a binary gender identity.<sup>10</sup> However, many young children will present with diverse gender expression or even identify in ways

outside of the cisgender binary; parents and other adults may perceive this as gender nonconforming, but in many cases this reflects the fact that binary gender is learned rather than predetermined.<sup>11</sup>

Gender diverse play or identities are a typical part of early childhood, and can last for days to years. TG/GD identities may develop over time, and for some children their articulation of gender diversity may not present until pubertal changes begin to emerge or even later into adolescence and young adulthood. It is important to note that very early gender diversity does not universally predict a later TG/GD identity; many children with prepubertal TG/GD identities will not develop signs of gender dysphoria as they approach and undergo pubertal changes.<sup>12</sup> The primary need of young children is a safe environment for gender exploration without assumptions about the child's future identity (Table).

However, some children will experience gender dysphoria with the anticipation of and development of gender identity-incongruent secondary sexual characteristics. These children, their families, and their communities need support and guidance from pediatric health care providers. Primary care providers should facilitate access to appropriate medical therapy to improve quality of life and obviate the need for downstream interventions to "un-do" unwanted pubertal changes. Without adequate psychosocial and physical support, some TG/GD children experience gender dysphoria expressed as anger, social isolation, intentional self-harm, or suicide attempts.<sup>13</sup>

The number of AYA identifying as nonbinary gender (gender outside of the man/woman binary) is growing, and estimated to be 25% to 35% of the total TG/GD population.<sup>2</sup> The very limited research on nonbinary adults suggests that they are at higher risk than binary TG/GD people for depression and anxiety, but research on AYA is missing.<sup>2</sup>

Pediatricians can support patients and families by asking all peripubertal children about gender identity in the psychosocial health assessment. They can ask, "When you think about yourself as a person, do you think about yourself as a boy, girl, some other gender, or are you not quite sure?" In caring for adolescents, these questions can be asked during the confidential time recommended by

**Table.** Terms and Definitions

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<i>Assigned sex or birth sex or assigned sex at birth</i>	— The sex assigned to a person by their family and health care team at birth, typically based on anatomy and genetics
<i>Asserted gender or preferred gender</i>	— The labels an individual chooses to best characterize their lived experience of gender; reflected in name, pronouns, external presentation
<i>Gender dysphoria</i>	— The discomfort that can exist when one's gendered sense of self is not congruent with the sex assigned at birth
<i>Legal gender/sex</i>	— The gender marker that is reflected in government issued identification documents (driver license, passport, birth certificate)
<i>Social transition or social affirmation process</i>	— Reversible process of asserting gender identity by changing hairstyle, clothing, body shapers, pronouns, name, and body language
<i>Social challenges</i>	— Challenges experienced as one undergoes a social transition or affirmation process, typically involving peers, family, or community reaction
<i>Nonbinary gender</i>	— Feminine gender identity that falls outside of the male/female gender binary
<i>Transgirl/transfemale</i>	— One who identifies as a girl/female but was assigned male sex at birth
<i>Transboy/transmale</i>	— One who identifies as a boy/male but was assigned female sex at birth

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the American Academy of Pediatrics Committee on Adolescence.<sup>14</sup> We recommend that open-ended inquiries about gender identity begin in early puberty, and that discussions of gender diversity and development be included as critical parts of pediatric health care. We also recognize that earlier inquiry about gender dysphoria may be appropriate for younger children who are struggling with school, socialization, or other behavioral health concerns.

### **PREVENTIVE HEALTH CARE AND OPPORTUNITIES TO PROMOTE RESILIENCE**

The reminder that “sexual orientation and gender identity are not risk factors for health problems; stigma associated with those identities creates the risk,”<sup>15</sup> bears repeating. For pediatricians, the goal of early and open discussion with TG/GD youth and their families is to provide earlier support. Providers can address experiences of self-stigmatization by TG/GD AYA, and support patients who experience stigmatization through others, such as family members, schools, or their social networks. Providers can guide patients and their families to supportive resources, expecting the outcome to be an affirmed and mentally healthy young person. Many primary care providers will refer to a clinic specializing in gender-focused care, but primary care settings should provide preventive care and foster resilience for patients and families, while also being attentive to potentially increased risk for eating disorders<sup>16</sup> and other mental health sequelae (eg, anxiety and depression).<sup>13,17</sup> Additionally, primary care providers should be aware of the ambiguous association between autism and gender dysphoria.<sup>18,19</sup> Pediatricians can support and educate families, advocate in schools, and connect families to community support groups or advocacy organizations.

### **SUPPORTING YOUTH THROUGH STAGES OF GENDER AFFIRMATION AND SERVING AS ADVOCATES**

Health care providers can serve as effective advocates for TG/GD youth by becoming familiar with options for social, medical, and surgical affirmation. For gender dysphoria that worsens with the onset of puberty, it is essential that pediatricians know about puberty suppression treatments, as well as the need to advocate with insurance companies for coverage of these costly medications. They can provide patients and families with resources for social and community support, safe practices for nonmedical body modifications (eg, chest binding or padding, genital tucking or packing),<sup>20</sup> letters to schools for a student’s use of gender-affirmed bathrooms and locker rooms, and documents to enable gender marker change on birth certificates and passports.

## **SOCIAL AFFIRMATION AND INTEGRATION: PSYCHOSOCIAL CONTEXT AND HEALTH OUTCOMES**

### **SOCIAL AFFIRMATION PROCESS**

Social affirmation refers to “transitioning” from living in the gender role of one’s sex assigned at birth to living in

accordance with one’s affirmed gender. Affirmed gender is manifested by gender expression (clothing, grooming) as well as social determinants such as name, pronouns, and demeanor. Beyond these definitions, gender is a lived experience of encountering daily gender attribution by others. Research suggests that for TG/GD adults, misgendering (being referred to with nonaffirming name and/or pronoun) or being “identifiable” as a transgender person is associated with worse mental health,<sup>21</sup> but studies have not explored this specifically for TG/GD AYA. For adolescents, support from families and communities improves psychosocial outcomes.<sup>17,22</sup> Additional research is needed to explore the mechanisms through which gender identity and gender attribution affect mental health.<sup>2</sup> For example, what are the health outcomes of TG/GD AYA who experience affirmation from their families and personal social networks but are not affirmed in the school environment, or in their broader social environments? We know little about the extent to which supportive family and peers can buffer hostile school environments.<sup>23</sup> However, research has shown that attending a high school with a Gender and Sexuality Alliance, is associated with better attendance, mental health and substance use outcomes for lesbian, gay, bisexual, and transgender youth.<sup>24,25</sup>

### **MENTAL HEALTH AND THE MINORITY STRESS MODEL**

A gender diverse identity is not a mental illness, yet those with gender diverse identities have significant disparities in mental health compared with their cisgender peers. The increased risk for negative psychosocial outcomes is fairly well established,<sup>5</sup> and includes high rates of self-harm,<sup>26</sup> suicidality,<sup>27</sup> sexual and physical victimization,<sup>28</sup> and homelessness.<sup>29</sup> Thirty-nine percent of TG/GD adults in the 2015 US Transgender Survey reported experiencing serious psychological distress, compared with 5% of the US population.<sup>2</sup> Forty percent had attempted suicide in their lifetime, nearly 9 times the US population rate (4.6%). Seven percent attempted suicide in the past year—nearly 12 times the US population rate (0.6%).<sup>2</sup> TG/GD or questioning adolescents (aged 11–19) completing the Profiles of Student Life: Attitudes and Behaviors Survey<sup>30</sup> reported an even higher percentage of past year suicide attempts: 51% of transboys, 30% of transgirls, 42% of nonbinary individuals, and 28% of those who were questioning their gender identity.<sup>30</sup> In the same study, past year suicide attempt rates were 18% for cis-girls and 10% for cisboys.<sup>30</sup>

Social science research attributes these outcomes largely to the minority stress model,<sup>31–33</sup> which links social exclusion and stigma-based marginalization to negative psychosocial behaviors and related health outcomes.<sup>34</sup> This model was developed for cisgender LGB individuals, and when applied to TG/GD AYA communities shows the same connection with mental health outcomes, but has yet to be validated in individuals under age 18.<sup>35,36</sup> In one large online study, fewer than 25% of TG/GD youth reported that they could “be themselves” in their homes or at school; 72% had heard family

members make negative comments about LGBTQ people.<sup>37</sup> Minority stress can also lead to decreased access to affirming health care.<sup>38</sup> Providers' should aim to minimize minority stress, by creating affirming clinic environments, fostering resiliency, increasing community connectedness, advocating for social affirmation within psychosocial contexts, and encourage self-care practices including as needed use of mental health supports.

### MEDIATION OF RISK

There is not a single prescribed path to affirming one's gender. Qualitative research may prove particularly useful in clarifying which social interventions, emotional supports, and physical modifications are most effective at improving mental health and reducing suicidality and self-harm.<sup>39,40</sup> Nonmedical interventions such as voice training, body modification strategies (eg, genital tucking or chest binding) can lessen dysphoria and enhance resilience.<sup>20,40,41</sup>

Additional research is needed on how the long-term well-being of TG/GD AYA is influenced by social affirmations, such as pronoun use, name changes, and access to gender-inclusive restrooms.<sup>42,43</sup> We know little about the social experiences and special health care needs of nonbinary identified youth, and their experiences need specific study. Their social affirmation process may not follow binary paths, and many may not seek medical intervention, but nonbinary individuals likely benefit from psychosocial and health care supports (ie, use of affirmed name and gender-neutral language: they/them/their, "person").<sup>44,45</sup>

### CHALLENGES WITH THE HEALTH CARE SYSTEM

TG/GD patient care experiences are often deeply suboptimal, and health care settings need many modifications to better support TG/GD patients. Interactions with providers and support staff, data recording in clinic forms and software, are built on the assumption of binary gender that matches sex assigned at birth. Inadequate TG/GD patient care education (eg, asking affirmed name/pronouns, taking an appropriate sexual health history) during health professional training has led to a workforce that feels inadequately prepared to care for noncisgender patients. Our systems' reliance on cis-normative electronic medical records results in misgendering events that are built-in to patients' experiences. Many studies describe the marginalization experienced by TG/GD adults in clinical settings, which can lead to avoidance of health care and poor outcomes.<sup>2,46,47</sup> Better study of our health care systems and their interactions with TG/GD communities will help improve health services delivery. In a pediatric setting parents may not be ready to use a child's asserted name and pronouns, just as a child may not be ready to disclose their gender identity. Therefore, clinicians need to carefully manage patient and family relationships to minimize alienation of parent and child from each other or from providers.

## MEDICAL TREATMENT: HEALTH AND FERTILITY IMPACTS

Hormone-related therapies can support TG/GD AYA in 2 ways: through the suppression of puberty or through gender-affirming hormone treatment.

### PUBERTY BLOCKERS AND ANTI-ANDROGENS

Supporting TG/GD youth whose gender dysphoria emerges or worsens at the onset of puberty may include suppression of natal puberty with gonadotropin-releasing hormone analogues (GnRHa). Ideally, pubertal blockade begins in the early stages of puberty (sexual maturity rating 2–3) but can be initiated at any point after the onset of pubertal development to prevent further development of nonaffirming secondary sexual characteristics. Antiandrogens, medications which block the effect of testosterone, are less expensive than GnRHa and may be used after the completion of puberty in transgirls. There is neither evidence nor recommendation for their use in blocking puberty. Treatment with GnRHa or antiandrogens is completely reversible, and gives the child and family time to consider any future hormonal or surgical treatments. However, these decisions should be guided by careful patient- and family-centered shared decision making; for example, consideration of the fact that early initiation of pubertal blockade with GnRHa may result in future infertility and inadequate tissue for potential affirming genital surgeries.

### HORMONE TREATMENT

Hormone treatment can be considered as early as midadolescence, after the initiation of puberty, with a goal of developing affirming secondary sexual characteristics and improving psychosocial outcomes.<sup>5,6</sup> A multicenter prospective study of US transgender adolescents initiated in 2015 will inform standards of care for medical and surgical treatment,<sup>48</sup> but many more similar studies are needed. Unlike GnRHa treatment, gender-affirming hormone treatment is considered partially reversible, as some of the physical effects (eg, redistribution of body fat) will reverse if gender-affirming hormones are discontinued or because they can be surgically reversed (breast development), and other changes are permanent, such as voice deepening and genital changes stimulated by testosterone.<sup>49</sup>

### FERTILITY PRESERVATION AND REPRODUCTIVE HEALTH

Offering fertility preservation (including cryopreservation of semen and oocytes) prior to hormonal or surgical treatment is considered standard care in transgender medicine.<sup>49–52</sup> However, uptake for transgender youth is low, in part because of limited information, availability, and insurance coverage, and possibly reluctance of providers to talk about fertility preservation options.<sup>53–55</sup> Although spermatogenesis is greatly reduced through estrogen treatment, and ovulation is reduced with testosterone treatments, the long-term effect on fertility is poorly understood. Moreover, gamete freezing is only established for patients who have undergone natal puberty, which may complicate the



treatment of gender dysphoria in peripubertal patients who might desire to have biological offspring in the future.

### TRANSFEMALE FERTILITY ISSUES

Feminizing hormone therapy likely reduces spermatogenesis over time.<sup>56</sup> Fertility preservation discussions need to occur before initiating treatment. Transgirls who start puberty blockade in midpuberty (sexual maturity rating 3), may not yet produce viable sperm; if they continue puberty blockade and begin estradiol treatments there is a high risk of permanent infertility. There is little guidance for interruption of puberty blockade and hormonal treatment to promote spermatogenesis and sperm collection for cryopreservation. Sampling of immature testicular tissue and spermatogenesis in vitro is purely experimental.<sup>57,58</sup> We are aware of a single small study of transgirls and return to fertility after cessation of hormone treatment.<sup>59</sup>

### TRANSMALE FERTILITY ISSUES

There is a small but emerging literature based on transmen's pregnancy experiences.<sup>60</sup> However, there is a marked lack of guidelines for supportive fertility, pregnancy, and postpartum/early parenting care.<sup>61–63</sup> Stimulation of ovulation and oocyte collection can induce severe dysphoria both through hormones necessary for ovulation, as well as transvaginal ultrasounds that are performed as part of the process. Return to fertility after discontinuation of testosterone is well-documented,<sup>60</sup> with pregnancies and live birth reported even after prolonged hormone treatment, often without the use of reproductive technology.<sup>64</sup>

Gender-affirming hormones should not be considered a contraceptive strategy as there remains a residual risk of conception.<sup>65</sup> In addition, we have little evidence for contraceptive efficacy for TG/GD individuals at risk for pregnancy,<sup>61,66</sup> and there may be increased risk of unintended pregnancy in those taking testosterone (a known teratogen), and inadequate ovulatory suppression with testosterone treatment.<sup>61</sup>

### SCREENING FOR SEXUALLY TRANSMITTED INFECTIONS AND REPRODUCTIVE ORGAN CANCER

Health care providers need to talk with TG/GD AYA about sexual health, regarding both contraception and human immunodeficiency virus (HIV)/sexually transmitted infection (STI) risk. Questions about type of sex and body parts used (penis/vagina, penis/anus, mouth/genitalia) should be asked in an affirming way to guide screening for HIV/STI, initiate treatment or pre-exposure prophylaxis, counsel for sexual risk reduction, and individualized contraceptive options for those at risk for conception. Providers need to be aware that "routine" exams, such as Pap smears or testicular exams, can be traumatizing to patients, and again patient-centered shared decision making remains a powerful tool in optimizing both cancer screening and the patient-provider relationship.

The gynecological/urological and reproductive health of TG/GD individuals need more study. The needs of transwomen for prevention of HIV,<sup>67</sup> human papillomavirus,<sup>68</sup>

and other STI are relatively well studied, but comparatively fewer studies are published on the needs of transmen.<sup>69–71</sup>

### CARDIOMETABOLIC HEALTH

Most longitudinal research examining cardiovascular disease and venous thromboembolism (VTE) risk has been done in transwomen taking ethinyl estradiol in Europe.<sup>72–75</sup> In the United States, it is current practice to use oral or transdermal 17 $\beta$ -estradiol to reduce risk for VTE.<sup>75</sup> In the United States, transgender adults have a higher prevalence of myocardial infarction than their cisgender peers.<sup>76</sup> Transwomen taking gender-affirming hormones may have moderately increased risk for a broad range of cardiometabolic disease (abnormal lipids, insulin resistance, myocardial infarction), and thromboembolic events, which may be mitigated by using transdermal instead of oral estradiol.<sup>76–79</sup>

Transmen taking testosterone have increased risk of cardiovascular disease, due to erythrocytosis, atherogenic changes in lipids, increased risk for type 2 diabetes mellitus and increased visceral fat accumulation.<sup>49</sup> Yet, evidence from longitudinal studies of transgender adults does not provide clear guidance for clinical counseling of TG/GD youth about these long-term cardiovascular risks, which must be contrasted with the psychosocial benefits of early hormonal treatment.

### CANCER RISK

The Endocrine Society states that there may be moderate risk for hormone responsive cancers (breast, uterine) among those taking hormones, and risk should be monitored by a clinician;<sup>50</sup> however, studies have not clearly demonstrated increased risk of reproductive organ cancers.<sup>80</sup> Evaluating the potential effect of gender-affirming hormone treatment on cancers, with controls for smoking, human papillomavirus or HIV infection, and other behavior risk factors, requires carefully designed, long-term epidemiologic studies. Long-term risk is particularly important to assess in TG/GD AYA who could have decades of exposure to hormones. Routinely including gender identity in medical records is an important first step, as recognized by the World Professional Association for Transgender Health,<sup>81</sup> to enable identification of appropriate subjects for inclusion in long-term outcomes assessment.

### BONE HEALTH

Bone mineral turnover accelerates to increase bone mineral density (BMD) during puberty. There is very little research on the effects of GnRHa on BMD in TG/GD youth. There is limited research on other effects of GnRHa, including cognition, emotional health, and cardiovascular health. The current safety profile of GnRHa treatment is based on extensive use in central precocious puberty, the long-term outcomes for TG/GD AYA are unknown.<sup>82</sup> The few studies available suggest a decrease in BMD during treatment with GnRHa and return to normal values after stopping GnRHa or adding gender-affirming hormone treatment.<sup>50,83,84</sup> Daily physical activity and

maintenance of adequate vitamin D levels are recommended to promote BMD.

### DOSING REGIMENS

The Endocrine Society recommends starting a relatively low dose of gender-affirming hormones and increasing to higher doses over the first 9 to 12 months of medical treatment for postpubertal TG/GD youth and adults.<sup>50</sup> This schedule allows for laboratory monitoring over time, with identification and treatment of any adverse effects as well as patient-centered titration of hormone dosing. During treatment, attention to emotional and mental health and well-being is important as the effect of hormones on the body and on the brain may cause emotional changes; in general, hormonal treatment alleviates gender dysphoria-related distress and may improve other areas of mental health functioning.<sup>85</sup> In addition to mental health considerations, providers need to monitor for adverse effects, especially related to liver function, as both estradiol and testosterone are metabolized in the liver.

For those who have taken GnRHa to suppress natal puberty, gender-affirming hormones may be started at lower doses and gradually increased to mimic a natal pubertal progression.<sup>86</sup>

### SURGICAL TREATMENT: PHYSICAL AND MENTAL HEALTH IMPACTS

Along with social and hormonal treatment, gender-affirming surgery (GAS) can be an important element in the treatment of gender dysphoria. The demand for GAS is increasing,<sup>87</sup> thus making it imperative to conduct well-designed research on the short and long-term impacts of specific surgical interventions.<sup>88</sup> The most common GAS for adolescents is transmasculine chest reconstruction, also called chest wall masculinization or “top surgery.” Many surgeons will perform this procedure for minor adolescents (<18 years), but we are not aware of any studies that specifically evaluate mental and physical outcomes among adolescents. One study of 43 transmen (mean age 27.7, range 18–50 years) reported improvement in overall quality of life after top surgery compared to before top surgery.<sup>89</sup> Most studies examining mental health and quality of life after GAS have been cross-sectional and have not controlled for patient diversity and stage of social affirmation, or included physical health outcomes.<sup>90–93</sup> Future studies must examine the mental health effects of standardized surgical protocols among adolescents, differing timelines of therapy (eg, order of social/medical/surgical and legal stage of social affirmation), and non-surgical treatments (eg, hair removal, voice therapy, and peer support).

For minor adolescents who desire top surgery, the guidelines recommend at least 12 months of hormone therapy to demonstrate a commitment to social affirmation, as well as a letter of support from at least one mental health provider. Some TG/GD AYA may only want top surgery (without hormones) and treatment must be patient centered and individualized outside of these or any future

guidelines. Genital GAS (typically called “bottom surgery,” and consisting of a range of different procedures is not recommended until TG/GD AYA achieve age of majority/consent and have engaged in mental health therapy.<sup>49,50</sup> These requirements and guidelines may conflict with the desires of patients who may prefer only surgical and other physical interventions without hormones.

### PEDIATRIC EDUCATION

Medical education should include gender identity development and diversity. Providers in all specialties need to be aware that their patients may have diverse genders, and may or may not seek gender-affirming medical care. Pediatricians are often the first exposure of children and adolescents to the health care system, so they carry a special responsibility to set the stage and introduce the spectrum of gender identity in an affirming and supportive manner for children and their families.

Curricula for all health professionals needs to include TG/GD considerations.<sup>94</sup> Many medical schools offer TG/GD-focused elective experiences which are largely well received by learners but are seldom longitudinal experiences.<sup>95</sup> Overall curricular LGBTQ health content is limited and often includes little clinical experience.<sup>96</sup> The Association of American Medical Colleges released clinical competencies for LGBT health care in 2014,<sup>94</sup> which were novel and important, but its integration into medical school curricula is unknown. Providers across clinical specialties with little formal education<sup>97,98</sup> are likely to be caring for TG/GD patients and their families in their practices, and need to navigate advocacy and possible friction between patients and families. It is imperative that continuing medical education address this gap.

### OPPORTUNITIES AND FUTURE IMPLICATIONS

The biopsychosocial model is particularly applicable for AYA; youth typically live with parents or guardians, attend middle and high school, and cannot easily choose or change their lived environment. Consideration of contextual factors that shape health and well-being for these patients must include the nuclear family, extended family and friends, and the school setting, at a minimum. Treating the whole patient includes attention to how different social environments, both supportive and nonsupportive, shape physical and mental health.

In this section we reiterate and identify opportunities for improvement in the areas of Clinical Care, Research, Pediatric Education, and Policy and Advocacy.

### CLINICAL CARE

We identify 3 opportunities that clinicians can easily adopt, without significant cost or additional training, to improve the overall experience of TG/GD youth.

*Opportunity: Early recognition of TG/GD youth and potential associated mental health sequelae.* Clinicians should ask parents and young patients about signs of gender dysphoria. Inquiries about mental health, friends, and

school well-being should include questions about bullying and safety concerns. These questions will help to identify minority stress experiences, and enable early support and mitigation. Clinicians caring for TG/GD youth should be attentive to risks, and recognize and promote resilience. Ideally, parents, teachers, and school-based support personnel such as guidance counselors, social workers, and school nurses all maintain awareness that any child could be struggling with gender identity issues, and provide support and referrals as needed. Close attention to dissonance between children and their parents is critical; some parents are supportive of gender-diverse children, but others cannot understand or accept their chosen gender identities. Helping parents and families support their TG/GD youth is imperative for long-term healthy psychosocial outcomes.<sup>22,99</sup>

*Opportunity: Create a welcoming clinical environment for TG/GD AYA.* Clinics can demonstrate a gender-inclusive approach in ways that benefit all children and AYA, and role model inclusive attitudes for families. Training front desk and phone staff is important, as is displaying materials featuring diverse young people. Clinics where “Safe Space” training is adopted can display a symbol (eg, rainbow or equality sign) that denotes openness and responsiveness to LGBTQ people. Clinic forms for patients should include the option to mark an affirmed name, pronouns, and include a space for patients to self-identify gender and sexuality.<sup>81,100</sup> Clinicians and health care systems can advocate for adaptation of electronic health records to create fields for affirmed name and pronouns, legal name, affirmed gender, legal gender, assigned sex at birth, and organ inventories.

*Opportunity: Incorporate gender-affirming reproductive health care, including STI prevention and treatment, as routine part of all clinical encounters with AYA, without making assumptions based on their sexuality or gender identity.* All youth need a comprehensive sexual history to guide screening and decision-making. TG/GD youth are at especially high risk for STI/HIV; those with the capacity to become pregnant are at risk for unmet contraceptive needs and unplanned pregnancies. TG/GD AYA also need discussion around the fertility implications of their gender-affirming treatments.

## CLINICAL RESEARCH

Existing TG/GD AYA research challenges include small sample sizes and lack of data on long-term outcomes of adolescent hormonal and/or surgical therapies. Creation of research consortiums across pediatric medical centers would allow for larger sample sizes and standardized evaluations of interventions. As described throughout the document, there are many research opportunities for improved care for TG/GD AYA. We propose 6 research opportunities that have great potential to improve quality of care and outcomes for TG/GD patients:

*Opportunity: Develop a validated protocol for early recognition and support of TG/GD children that balances the*

*benefits of early support with the risk of pathologizing TG/GD identities.*

*Opportunity: Explore how mental health is affected by discrepancies between AYA’s own gender identity and gender attribution by others.*

*Opportunity: Evaluate the effect of electronic health care records that incorporate fields comprehensive for TG/GD patients (eg, affirmed name, pronouns, assigned sex at birth, inventories, etc) on TG/GD patient experiences in the health care setting.*

*Opportunity: Examine the long-term effects of hormonal treatment for TG/GD AYA, especially on reproductive health and fertility preservation, cardiometabolic health, risk for VTE, cancer risk, and optimal hormonal dosing.*

*Opportunity: Examine mental health and quality of life after nonsurgical and surgical gender-affirming treatments.*

## PEDIATRIC EDUCATION

We emphasize one essential opportunity that has the potential to greatly improve the quality of care and subsequent patient outcomes:

*Opportunity: Incorporate gender diversity education into curricula across the spectrum from medical students to practitioners.* Pediatric health care providers are increasingly being asked to care for youth who identify as TG/GD, but without adequate training, many lack confidence in providing evidence-based care. The key educational needs for empowering and guiding the care of TG/GD patients are: 1) identifying TG/GD youth through early recognition and support in ways that are not pathologizing; 2) identifying the needs of TG/GD youth for social affirmation and preventive health care; 3) recognizing behavioral risks and opportunities to promote resilience; 4) supporting youth through individualized social affirmation processes; and 5) advocating for TG/GD patients who encounter challenges with family, school, and other social environments.

## SOCIAL CONTEXT, POLICY, AND ADVOCACY

We identify 2 opportunities for pediatric providers to advocate on behalf of their patients. These opportunities represent only a very small subset of larger social change that is necessary to improve the lives of TG/GD AYA. Issues of racism and poverty affect all children, adolescents, and young adults, but TG/GD AYA may be particularly at risk as they are already marginalized and suffer from minority stress.

*Opportunity: Support access to public spaces TG/GD AYA should be allowed to use restrooms and locker rooms that align with their gender.* Pediatricians who care for TG/GD patients can write letters for their patients to access appropriate facilities in school, highlighting the negative mental and physical health impacts of limited or discriminatory access to facilities.<sup>101</sup> This may also help



parents to adopt a supportive stance if they are worried about poor treatment of their TG/GD child at institutions such as schools.

*Opportunity: Advocate for legal access to insured health care, and name and gender marker change in identity documents and inclusive policies toward TG/GD AYA across all institutions. TG/GD AYA need legal gender affirmation and identity documents that are congruent with their lived gender in order to access services.* Pediatricians are ideal advocates for policy issues such as improved insurance coverage of TG/GD health care (especially coverage of puberty blockers [GnRHa]), and eased restrictions of gender marker changes on birth certificates. Pediatricians can advocate for patient centered rather than standardized gender-affirming care. More generally, pediatricians should continue to speak up whenever there are policies, forms, or institutional arrangements that are noninclusive or even hostile to TG/GD AYA.

## CONCLUSIONS

Pediatric health care providers can play a critical role in guiding solutions in policy and advocacy, clinical care, research, and education to improve the health of TG/GD youth. Many government entities, especially at the state and local level, actively resist efforts promoting equal rights.<sup>102,103</sup> Evidence suggests that public policy at the national and state level can have direct effects on the lives of historically underrepresented individuals and communities.<sup>104</sup> Comprehensive evidence-based health care, medical education, and research funding are necessary to promote the well-being of TG/GD individuals. Physician advocacy for patients and within systems, through research, education, and clinical support, has a profound impact on the health, safety, and well-being of generations of TG/GD AYA.

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