Hormone Research in Paediatrics

Mini Review Article

Horm Res Paediatr 2022;95:405–414
DOI: 10.1159/000524030

Received: October 12, 2021
Accepted: March 8, 2022
Published online: March 10, 2022

Care for Transgender Young People

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Keywords
Transgender and gender-diverse youth · Gender-affirming care · Pediatric care · Puberty blockers · Gender-affirming hormones

Abstract
Clinicians of all disciplines, including pediatric endocrinologists, are likely to encounter transgender and gender-diverse (TGD) young people in their practice regardless of whether they specialize in gender-affirming medical care. Because of this, it is important to be aware of the ways in which medical professionals can affirm these individuals. Although gender-affirming therapy should always include affirmation including proper use of names and pronouns, the transition journey will look different for each patient. The gender-affirming care of TGD young people may include both medical and nonmedical interventions (e.g., social transition). Therapies utilized for medical gender transition such as gonadotropin-releasing hormone agonists and/or gender-affirming hormones have implications for growth, bone health, cardiovascular health, and fertility, although these impacts are not yet completely understood. This review provides an overview of the care of transgender young people as well as a summary of what is known about the outcomes of these therapies. Clinicians should advise TGD young people and their families of the known and unknown risks and work together with patients to decide upon a treatment and follow-up regimen that aligns with their individual gender affirmation and health goals.

Introduction

As the number of transgender and gender-diverse (TGD) young people increases, all clinicians are likely to encounter TGD individuals in their practice, whether seeking gender-affirming care or other care for other medical conditions [1]. Data from the 2017 Youth Risk Behavior Survey reported that approximately 1.8% of young people identify as transgender; however, a study examining gender identity in one urban school district that utilized a two-step measure of gender identity assess-

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Table 1. Key terms

ASAB or DSAB	The classification of an individual as female or male, typically done by a medical provider at or prior to birth. This classification is generally based on external sexual characteristics and/or sex chromosomes
TGD	An overarching term describing individuals whose gender identities and expressions differ from their ASAB based on traditional expectations of gender expression
Transfeminine	An individual designated male at birth who has a feminine or feminine-leaning gender identity
Transmasculine	An individual designated female at birth who has a masculine or masculine-leaning gender identity
Cisgender	An individual whose gender aligns with the sex they were assigned at birth
Gender dysphoria	A clinical categorization of significant persisting psychological distress due to incongruence between one's ASAB and one's gender
Gender euphoria	The experience of positive emotions associated with one's gender identity, expression, or presentation
Gender-affirming care	A general term that can include transition-related medical care as well as the overarching concept of healthcare settings that are inclusive of a variety of genders and gender expressions. It is frequently used to describe transition-related medical care
Social transition	Aspects of gender transition that individuals may pursue unrelated to medical care. This may involve social or legal name changes as well as other means of gender expression such as social roles, hair, and clothing
Medical transition	Term used to encompass healthcare and procedures used to affirm one's gender. This may include puberty blockers, GAHs, and/or surgical interventions
Puberty blockers or "blockers"	Medications that can be prescribed to prevent the development of secondary sex characteristics associated with puberty. In the USA, these are typically GnRHas
GAHs	Estrogen for transfeminine individuals and testosterone for transmasculine individuals

ASAB or DSAB, assigned or designated at birth; TGD, transgender/gender diverse; GAH, gender-affirming hormones.

ment found that 9.2% of young people reported incongruence between their assigned sex at birth and their gender identity [2, 3]. The foundation of gender-affirming care for TGD young people is creating an affirming environment in which the patient feels safe. Additional care may range from providing support and guidance to those embarking on a social transition to more complex medical or surgical intervention. It is fundamental that clinicians ensure that their practices affirm the young people that they serve as nonaffirming healthcare experiences or environments may deter TGD young people from seeking healthcare.

TGD children may view themselves in terms of their gender from an early age and may experience the embodiment of their gender in a variety of ways (Table 1) [4]. This may include gender dysphoria (e.g., significant psychological distress due to incongruence between their sex designated at birth and gender identity) but may also include gender euphoria (e.g., positive emotions and feelings regarding their gender identity and expression) [5]. Although the presence of gender dysphoria has traditionally been considered a necessary criterion for gender-affirming care, this may not be appropriate for all patients. Instead, we suggest tailoring gender-affirming care to the individual needs of the TGD individual, while considering contextual factors such as age, developmental stage, and caregiver support. Current guidelines for medical gender-affirming care for TGD young people rely on data derived from the treatment of transgender adults or other groups (i.e., pubertal suppression in children with precocious puberty) as well as expert opinion [6, 7]. This review seeks to summarize the existing literature on gender-affirming care in pediatric populations and young adults including what is known about health outcomes and areas where data may be lacking.

Approach to Pediatric Transgender Health

Initial Approach

An affirmative, nonjudgmental first clinical encounter is vital to building trust in the patient-provider relationship [8]. The initial assessment should focus on the patient's treatment goals and include a comprehensive

medical and social history including a developmental history, the duration and course of gender dysphoria or incongruence, the home and school environments, mental health, sexual health, and substance use, as appropriate [1, 8, 9]. Specific risks such as suicidal ideation or self-harm should be evaluated and addressed. Clinicians should be aware that TGD individuals may have experienced discrimination and stigma within healthcare settings and should incorporate an affirming approach by using open-ended, inclusive language, especially surrounding identity and romantic partners, and by asking patients what terms they use for their body parts (e.g., "chest" may be preferred over "breasts"). The diagnosis of gender dysphoria should be made in concert with a complete evaluation by a mental health provider, and patients should be encouraged to engage with ongoing mental healthcare. If medical gender transition is determined to be beneficial, patients can then be referred on to a medical provider; however, gender-affirming care is not limited to medical gender transition and should include assistance with social transition and family support as reviewed below.

The recent increase in young people identifying as TGD has led to concern that individuals with poor mental health, parent-child conflict, and/or maladaptive coping strategies may be socially influenced to present for gender-affirming care. A recent study of TGD young people presenting for gender-affirming care in Canada found no associations between recency of awareness of gender and mental health scores, mental health behaviors, or parental support [10].

There is relatively little data on gender fluidity or retransition (i.e., living as their sex designated at birth) in young people. For adults, however, the US Transgender Study reported 13.1% of participants had elected to retransition. The vast majority (82.5%) of these individuals cited an external factor, such as family pressure or social stigma, as the driving factor in this decision [11]. The number of adolescents and young adults who have elected to discontinue care in a gender program is not known, though it is anecdotally reported to be rising. These youth may be in any stage of transition, and it is unknown if they have experience consequences of doing so. It is also important to distinguish retransition, which may be driven by internal and/or external factors, from regret for receiving gender-affirming care [12]. One study of 55 transgender adolescents followed through their transition found that no participants reported regret at any stage of gender-affirming medical care [13].Affirmative care should be supportive of individuals' needs and exploration over time and allow for the dynamic nature of some TGD individuals' genders. At every encounter and every stage in the patient's gender journey, treatment goals should be reassessed. The clinician should make clear that the patient can change their treatment goals and/or plan at any time without judgment from the clinical team.

Social Transition

One of the most significant means by which many TGD young people may be affirmed in their identity is through social transition, using names, pronouns, clothing, and hairstyles that align with their gender identity. Simply using a TGD young person's chosen name significantly improves mental health; there is a reduction of depressive symptoms, suicidal ideation, and suicidal behavior even in the absence of overall social support [14]. These mental health benefits are more pronounced in TGD young people whose chosen names are used in a greater number of social contexts (i.e., at home, work, school, and/or with friends). Supporting TGD young people in their social transition is associated with lower rates of depression and anxiety in childhood; however, surveys of adults have not found an association between early social transition and improved mental health outcomes [15, 16].

All clinical staff should use the patient's affirmed name and pronouns and should take care to ensure that medical records and other clinical documentation document TGD patients' affirmed names. Clinicians should also encourage the proper use of names and pronouns by a patient's family and community, while recognizing that patients may not use the same name in all social spaces and that confidentiality should be practiced in such situations. Each social transition journey may be different, and clinicians should be prepared to support and affirm their patients' identities regardless of where they are on their journey and how that may or may not change over time.

Family and Community Support

Active support and affirmation from family significantly contributes to positive mental health outcomes and quality of life in TGD young people [10]. Higher levels of parental support, specifically, have been associated with reduced depressive symptoms, lower perceived burden of gender identity on quality of life, and increased life satisfaction among TGD adolescents [17, 18]. For families who are early in their child's gender journey, taking proactive steps to support their child (i.e., using proper names and pronouns, acquiring gender-affirming clothes) are important steps that can reduce the mental health

Table 2. Available GnRHas

Medication	Brand names	Administration and frequency	Dose
Nafarelin acetate	Synarel	Nasal spray 4 times per day	1,600–1,800 μg/day
Goserelin	Zoladex	Injected subcutaneously every 12 weeks	10.8 mg
Leuprolide acetate	Fensolvi	Injected subcutaneously every 6 months	45 mg
Leuprolide acetate	Lupron	Injected intramuscularly every 1 or 3 months	7.5 mg, 11.25 mg, 15 mg, 30 mg
Histrelin acetate	Supprelin	Implant placed every 1–2 years	50 mg
Histrelin acetate	Vantas	Implant placed every 1–2 years	50 mg
Triptorelin	Triptodur	Injected intramuscularly every 6 months	22.5 mg

risks typically associated with TGD young people. Affirmation and support from other people involved in the lives of TGD young people, as well as from the broader community, can also contribute to positive mental health outcomes [10]. Referrals to supportive community organizations and resources may be helpful, particularly in cases where family members are not supportive.

Medical Gender Transition

Early Pubertal TGD Young People

For early pubertal TGD young people, gender-affirming care may include the initiation of gonadotropin-releasing hormone analogs (GnRHas), to prevent progression of secondary sex characteristics not consistent with the individual's gender. The use of GnRHas can help assuage the gender dysphoria that typically escalates with the onset of puberty and may prevent the need for gender-affirming surgeries later in life – for example, transmasculine individuals can avoid the need for gender-affirming mastectomy by arresting breast development early in puberty.

Most of what is known regarding the impact of GnRHas on growth, metabolic effects, neuropsychological development, and fertility is abstracted from existing experience and the literature in children who have precocious puberty [19–21]. Data on the long-term impact of GnRHas on these parameters in TGD young people are limited. However, recent work has suggested that growth patterns of TGD young people on GnRHas are similar to those reported for prepubertal cisgender peers [22]. The use of GnRHas in TGD young people has been shown to mitigate the risk of depression, anxiety, and suicidality [23].

While GnRHas are primarily prescribed for early pubertal TGD young people, there are also benefits for those in mid to late puberty. Suppression of gonadal testosterone production allows transfeminine young people to avoid further masculinization and to use a more physiologic dose of estrogen. In transmasculine individuals, GnRHas can be used to achieve menses suppression in those not able to achieve amenorrhea with testosterone alone [6, 7].

There are a variety of GnRHa medications available for prescription. Table 2 lists these medications and provides further information on delivery and dose.

Pubertal or Postpubertal TGD Young People

Antiandrogen Therapies

Medications with antiandrogen properties have been used either alone or in combination with estrogen to achieve feminization in transfeminine individuals, especially when GnRHas are unavailable or cost-prohibitive. In the USA, spironolactone, an aldosterone antagonist, is commonly used to reduce the appearance of unwanted facial hair and acne via its inhibition of testosterone synthesis and action [24]. Although it is associated with hyperkalemia when used in as diuretic in patients with heart failure, TGD young people taking spironolactone have very low rates of hyperkalemia, and frequent monitoring may not be necessary [25]. Bicalutamide, an androgen receptor blocker, has been associated with fulminant liver failure when used in the treatment of prostate cancer, but this has not been reported in transfeminine individuals. Data on bicalutamide use in TGD young people are very limited, and longer term follow-up studies are needed [26, 27].

Menstrual Suppression

Transmasculine adolescents often desire amenorrhea [28]. Menses suppression can be achieved through combined estrogen- and progestin-based or progestin-only medications. Transmasculine individuals may prefer a progesterone-only approach in order to avoid estrogen. Progestins for menses suppression include oral (typically

norethindrone, norethisterone, or norethindrone acetate), injection (depomedroxyprogesterone acetate), subcutaneous implant, or intrauterine devices. Although for many adolescents secondary amenorrhea occurs after starting testosterone treatment due to the direct effects of testosterone on the endometrium, some may continue to have bleeding [28–30]. For individuals with unwanted uterine bleeding while on testosterone, clinicians should first assess if the testosterone dose is optimized by checking the administration technique and serum testosterone level. If adjustment of testosterone does not lead to amenorrhea, addition of a progesterone-only medication and/or GnRHa may be helpful. Transmasculine individuals who are sexually active with individuals who produce sperm should be counseled that even if they are not having menses, they may still ovulate and need contraception.

Gender-Affirming Hormones

TGD young people may also desire gender-affirming hormone (GAH) therapy in order to develop physical characteristics that align with their gender identity and/or gender embodiment goals. Although not universal, recent studies have suggested that up to 80% of TGD young people have used or would like to use GAH [31]. The use of GAH in TGD young people is similar to that of hypogonadal individuals, with timing and dose adjusted based on the individual's pubertal status at GAH initiation. For TGD young people who have been previously treated with GnRHas to pause endogenous puberty, the goal for pubertal induction with GAH is to mimic a gonadal-associated puberty as much as possible. For TGD young people who have completed their gonadal-associated puberty, a shorter timeline for dose escalation can be used (e.g., 3–6 months); however, care should be taken to avoid very rapid escalation of estrogen which can increase the risk for distorted breast development (e.g., tubular breasts) [6]. Estrogen and testosterone levels should be monitored every 3–4 months during the first year and then every 6–12 months once a stable dose is reached. Estradiol doses in transfeminine individuals should be adjusted to maintain an estradiol and testosterone level in the typical female range (e.g., estradiol 100–200 pg/mL and testosterone <50 ng/dL). For transmasculine individuals, testosterone doses should be adjusted to achieve testosterone levels in the typical male range (350–1,000 ng/dL). For transfeminine individuals, treatment with estrogen will lead to the development of breasts, a typically feminine fat distribution pattern, softening of the skin, and decreases in male pattern body and facial hair as well as testicular size. For transmasculine individuals, testosterone will cause development of an enlarged clitoris, deepening of the voice, increases in male pattern body and facial hair, increases in muscle mass, and redistribution of body fat.

Some TGD individuals may desire physical changes that are less pronounced or slower than those that would be produced by these typical female or typical male hormone ranges [32]. Such individuals may request lower doses of GAH or a shorter term GAH regimen. There are limited data on the effects of low-dose GAH, but clinicians should be aware of this option as it is offered by some providers, and requests for these types of GAH therapy are increasing.

The provision of GAH to TGD young people has been associated with a decrease in gender dysphoria, improvement in global psychological functioning, and decrease in depressive symptoms [13, 33]. Although current guidelines advice initiation of GAH after age 16 years, GAH can be initiated earlier in certain situations, including those in which waiting could have a negative impact on health or emotional well-being (i.e., prolonged hypogonadal state in individuals with previous GnRHa use or asynchrony with similar aged peers). A shared decision-making model with attention to medical as well as social implications should be used when providing recommendations for the timing of GAH initiation.

Table 3 and Table 4 summarize suggested hormone regimens for patients who have received an GnRHa since early puberty and require pubertal induction as well as postpubertal individuals who have already been exposed to their own gonadal puberty. Additional medications for gender transition may be available in other countries.

Outcomes of Medical Gender-Affirming Care

Mental Health and Well-Being

Medical gender-affirming care is associated with beneficial mental-health outcomes in TGD young people. GnRHa therapy is associated with decreases in behavioral and emotional symptoms, decreases in depressive symptoms, and increases in global psychological functioning, although it has not been associated with reductions in gender dysphoria [34]. GAH therapy is associated with reductions in gender dysphoria, depression, anxiety, and suicidality, as well as with improvements in quality of life and general well-being [35–37].

Table 3. Masculinizing therapy with testosterone*

	Pubertal induction	Postpubertal
Injection		
Testosterone cypionate OR Testosterone enanthate Testosterone undecanoate Mixed testosterone esters (Sustanon)	20 mg subcutaneous every other week or 10 mg subcutaneous weekly, increasing to 20 mg weekly then by 5–10 mg weekly every 3–6 months up to 50 mg subcutaneous weekly	20–25 mg subcutaneous weekly then increase to 50 mg subcutaneous weekly** OR 100–200 mg IM every 2 weeks** 250–1,000 mg IM every 10–20 weeks 250 mg every 2–6 weeks
Transdermal		
Testosterone gel		Low: 20.25 mg daily Initial: 40.5–60.75 mg daily Maximum: 103.25 mg daily
Testosterone patch		Low: 1 mg daily Initial: 4 mg daily Maximum: 8 mg daily
Implant		
Testosterone pellets	Not used for pubertal induction	150–450 mg every 3–6 months

Adapted from Endocrine Society Guidelines [8]. * May not be available in all countries. ** Higher doses may be used to achieve patient goals while maintaining male range testosterone levels.

Table 4. Feminizing therapy with estrogen*

	Pubertal induction	Postpubertal
Transdermal**		
Estradiol weekly or twice weekly patch	0.0125 mg daily, increase to 0.025 mg after 3–6 months, and then increase every 2–3 months up to 0.1 mg/day	Low: 0.05 mg daily Initial: 0.2 mg daily Maximum: 0.1–0.4 mg daily
Oral		
17β-estradiol	0.25 mg daily, increase by 0.25–0.5 mg every 3–6 months to 2 mg daily	Low: 1 mg daily Initial: 2–4 mg daily* Maximum: 8 mg daily* *If over 2 mg daily split twice daily
Injection		
Estradiol valerate	Not used for pubertal induction	Low: <20 mg IM every 2 weeks Initial: 20 mg IM every 2 weeks Maximum: 40 mg IM every 2 weeks
Estradiol cypionate		Low: 2 mg every 2 weeks Initial: 2 mg IM every 2 weeks Maximum: 5 mg IM every 2 weeks

Adapted from Endocrine Society Guidelines [6]. * May not be available or routinely used in all countries. ** Transdermal administration preferred for improved thrombosis risk profile.

Brain Development

Sex steroid exposure during pubertal development plays an important role in neurodevelopment specifically in development of the prefrontal cortex. Thus, there has been concern that the use of GnRHa to block pubertal development may interrupt the development of executive functioning. Although studies of cognitive development in TGD young people are limited, one study failed to find a difference in executive functioning between TGD young people treated with GnRHas and untreated TGD young people [38]. Studies of cognitive development in TGD young people are needed.

Growth and Body Composition

Optimizing height in TGD young people is an area of active investigation, and the effects of GAH on height are unclear. Studies of transfeminine individuals have demonstrated that height obtainment is variable depending on the bone age of participants at the onset of therapy, the estrogen dose, and the type of estrogen used [39, 40]. High-dose oral estrogen therapy during adolescence has been suggested to reduce adult height in transfeminine individuals predicted to have an adult height far outside the typical female range.

For transmasculine individuals, the use of aromatase inhibitors and the synthetic androgen oxandrolone to increase height has been suggested based on their use in cisgender boys and girls with Turner syndrome. Although retrospective analysis has suggested that oxandrolone may be beneficial in increasing adult height, prospective data regarding the benefit of these approaches in transmasculine young people are not yet available [41].

GAH shift body composition metrics toward a more typically feminine or masculine body composition based on the hormones administered. Transfeminine individuals undergoing estrogen therapy have an increase in body fat, decrease in muscle mass, and a decrease in waist-to-hip ratio, while transmasculine individuals undergoing testosterone therapy have a decrease in body fat, increase in muscle mass, and increase in waist-to-hip ratio [42].

The potential implications of gender-affirming medical treatments on anthropometric parameters and body composition are an important part of counseling and monitoring of gender-affirming care, especially as TGD young people are at increased risk for disordered eating and body dissatisfaction [43]. There is no consensus regarding which growth charts (e.g., affirmed gender vs. designated sex) should be utilized in the assessment of medical therapies on the growth of TGD young people.

Anatomical Development

The use of GnRHas for pubertal suppression reduces the development of secondary sex characteristics associated with the individuals designated sex. Specifically, GnRHas are associated with reduced breast development and subsequent desire for mastectomy in transmasculine individuals and reduced penile size in transfeminine individuals. Decreased penile development has implications for future surgical options; GnRHa use is associated with greater likelihood of intestinal versus penile inversion vaginoplasty [44].

Cardiovascular Risk

Testosterone treatment in transmasculine adults leads to a mild increase in systolic blood pressure, and estradiol treatment in transfeminine adults results in a decrease in systolic blood pressure within several months of beginning therapy [45]. Elevated blood pressure in TGD young people should be evaluated by traditional criteria by age.

Transfeminine adults have higher rates of stroke and venous thromboembolism than both cisgender women and cisgender men. This risk is likely decreased by using 17β-estradiol instead of ethinyl estradiol, although there are no studies that directly address this. Testosterone treatment in transmasculine adults has not been associated with an increased risk of myocardial infarction as compared to cisgender men, but it has been associated with increased risk compared to cisgender women [46].

Even before beginning GAH treatment, TGD young people appear to have increased cardiovascular disease risk including lower rates of physical activity and poor cholesterol profiles with lower high-density lipoprotein cholesterol levels [47, 48]. During GAH therapy, lipid profiles should be monitored, especially in those with underlying risk factors (i.e., obesity, diabetes, signs of insulin resistance, or impaired glucose tolerance). Baseline cardiovascular risk should be evaluated and optimized by addressing modifiable risk factors (i.e., weight, diet, and exercise habits) prior to beginning GAH.

Bone Health

Adolescence is a key period for bone development [49]. The use of GnRHas during this period delays and attenuates peak bone mass accrual. Bone mass is restored by testosterone therapy in transmasculine individuals; however, transfeminine individuals have BMD below the population mean even after estrogen therapy [50–54]. TGD young people have been found to have low BMD prior to GnRHa initiation, suggesting that the observed low bone density in TGD young people may be, at least in part, due to other factors such as lower weight bearing exercise rates, lower body fat, or lower calcium intake [48]. Because the fracture risk associated with the lower BMD observed in TGD individuals is unknown, periodic screening with dual X-ray absorptiometry during GnRHa therapy remains a recommendation, especially for those patients who are not yet taking GAH or who are not adherent to GAH therapy [54] Optimization of modifiable behaviors that impact bone health, such as ensuring adequate vitamin D and calcium and weight-bearing exercise, should be discussed with patients before and during gender-affirming care.

Fertility

Gender-affirming medical care can lead to subfertility and/or infertility. In early puberty, the use of GnRHas may result in failure of the gametes to fully mature. Current options for preservation of immature gametes including ovarian or testicular tissue cryopreservation are still considered experimental [55]. There have been recent reports of successful oocyte retrieval prior to testosterone initiation in a transmasculine patient receiving GnRHas; however, the number of oocytes received was small [56]. If GnRHa therapy is stopped prior to initiation of GAH, gamete maturation will proceed, and fertility can be restored. If a TGD individual has gone through gonadal puberty, a discussion with the patient about gamete preservation (e.g., egg or sperm cryopreservation) is recommended prior to initiation of GAH. Estrogen use in individuals designated male at birth has been associated with a reduction in gamete number, sperm mobility, and sperm quality [57]. Testosterone can cause an anovulatory state and amenorrhea; however, there have been pregnancies reported during and after cessation of testosterone use [58–60]. Thresholds for the impact of dose and duration of GAH on fertility are not known.

There are low rates of consultation and fertility preservation in TGD young people [61]. The reason for low rates of fertility preservation among TGD young people is likely multifactorial: delay in initiation of medical therapy, lack of knowledge about long-term effects of hormone therapies, expense and limited insurance coverage, desire to adopt or not have children, dysphoria associated with the procedure or body area, and invasiveness of the procedure [61–63]. Clinicians should balance the need to discuss potential for gender-affirming medical care to negatively impact fertility with the patient's desire for future family building and the severity of dysphoria [64]. Studies of TGD young adults have also found that clinicians may overemphasize the importance of genetically related parenthood. Ethical considerations surrounding fertility preservation should also exist [65].

Cancer Screening and Risk

There are limited epidemiological data to guide cancer screening for TGD people [66]. Described risks are equal to those in cisgender men and women [67]. Differences in anatomy (e.g., breast or prostate) affect the need for cancer screening, but the effect of GAH exposure on cancer risk is largely unknown. Until more specific guidance is available, the recommendation is to screen for cancer according to an individual's body part per current guidelines [67]. Vaccination against HPV and Hepatitis B is recommended as it is for children of any gender identity.

The literature on hormone-sensitive cancer risk in TGD individuals suggests that the prevalence is low [68]. The risk for breast cancer in transgender women is less than that of cisgender women but greater than that of cisgender men. The risk of prostate cancer in transgender women is less than that of cisgender men. In transgender men who have not undergone mastectomy, the risk of breast cancer is similar or slightly lower than cisgender women. Overall, there does not appear to be an increased risk of cancer in the transgender population [69, 70].

Conclusion

Gender-affirming care has been associated with improved mental health outcomes in TGD young people [13, 15, 71]. Medical interventions specifically are associated with decreases in depression and anxiety [13, 35, 36]. Modifiable lifestyle factors that can mitigate cardiovascular and bone health risk should be discussed prior to initiating and during gender-affirming therapy. Clinicians providing medical gender-affirming therapies should counsel TGD young people and their families on the expected changes as well as the known and unknown outcomes. More research regarding the long-term effects of GnRHa and GAH treatment is needed, especially for TGD young people.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

K.M. is supported by a grant from the Doris Duke Charitable Foundation (DDCF 2019-119). S.A.R. is supported by a grant from the National Institutes of Health (K08 HD100595-01A1).

Author Contributions

All the authors contributed to the writing of the manuscript. K.M. and D.K. provided revisions and editing. All the authors approved of the manuscript prior to submission.

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