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Supporting Transgender, Nonbinary, and Gender Diverse Youth During Solid Organ Transplantation

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ABSTRACT

As gender diversity becomes more understood and accepted in mainstream culture, medical systems and health care providers must learn to provide comprehensive and affirming care to gender diverse individuals. As the number of gender diverse pediatric patients continues to grow, these patients will be cared for by pediatric solid-organ transplant programs. This review summarizes the basic principles of gender-affirming care and describes how transplant teams can provide equitable and affirming care to young gender diverse patients undergoing solid organ transplant (SOT). In addition, this review uses kidney transplant as a framework to explore gender-affirming hormone therapy and gender-affirming surgery in the setting of transplant, laboratory value interpretation in gender diverse individuals, and the importance of an individualized approach in care of the gender diverse transplant recipient.

1 | Introduction

Over the last several decades, there has been increasing awareness and understanding in mainstream culture of transgender, nonbinary, and gender-expansive identities. As gender diversity is more widely recognized and understood, healthcare providers, teams, and systems must adapt to provide comprehensive and affirming care to gender diverse patients. Estimates of how many youths are transgender, nonbinary, or gender diverse vary based on the questions asked and the populations sampled, from 0.6% to 2% of youth identifying as transgender in many national or state-level population studies [1] to 9.2% of high school students identifying as gender diverse in an urban school setting [3]. Given the importance of a positive relationship between the patient and family and the transplant team and the fact that psychosocial variables can greatly influence transplant outcomes [4], building a welcoming and affirming space for patients and family members of all genders is fundamental. This review will provide an overview of gender-affirming care management strategies with specific consideration of solid-organ transplantation, using the example of kidney transplant to explore the intersection of solid-organ transplant and gender-affirming care in youth.

2 | Gender Terminology

A clear understanding of the difference between sex, sexuality, and gender identity and common terminology used in describing gender diversity is an important base on which to build affirming care (Table 1). Gender identity is the sense of maleness or femaleness (or both or neither) a person knows to be true about themselves, which can be defined only by the individual. Gender identity may change throughout a person's lifetime. Sex is a biological category and is typically assigned according to external genitalia. When the gender identity of an individual is different than the social expectations for the sex assigned at birth, it is described as gender incongruence [5] and the individual may

TABLE 1 | Sex and gender terminology Adapted from Safer 2019, GLAAD Media Guide (11th Edition), National LGBTQIA+ Health Education Center, Rafferty 2018.

Sex and gender terminology	
Gender identity (noun) [101]	A person's internal, deeply held knowledge of their own gender; may be male or female or identifying with both or neither
Gender incongruence (noun) [5]	Gender incongruence (GI) is defined as a condition in which the gender identity of a person does not align with the gender assigned at birth
Gender dysphoria (noun) [101]	Mental health term that refers to discomfort felt by some persons owing to lack of alignment between gender identity and sex assigned at birth
Transgender (adjective) [101]	Adjective for persons with gender identity not aligned with sex assigned at birth
Cisgender (adjective) [101]	Adjective for persons with gender identity aligned with sex assigned at birth
Nonbinary (adjective) [102]	An adjective used by people who experience their gender identity and/or gender expression as falling outside the binary gender categories of "man" and "woman"
Gender fluid (adjective) [103]	Describes a person whose gender identity is not fixed. A person who is gender fluid may always feel like a mix of more than one gender but may feel more aligned with a certain gender some of the time, another gender at other times, multiple genders together sometimes, and sometimes no gender at all
Agender (adjective) [103]	Describes a person who identifies as having no gender, or who does not experience gender as a primary identity component
Gender expression (noun) [102]	External manifestations of gender. For example, this may be expressed through name, pronouns, clothing, haircut, voice, and/or behavior. While societies/cultures classify these external cues as masculine and feminine, what is considered masculine or feminine changes over time and varies by culture
Gender affirmation (noun) [103]	An umbrella term for the range of actions that transgender and gender diverse people may undertake to live in greater alignment with their gender identity and/or gender expression, and thus thrive as their authentic selves. A person may affirm their gender identity or expression through social, legal, medical, or surgical means. What gender affirmation looks like for every individual is unique and based on what is personally affirming, what feels safe to do, and what is accessible and available
Social affirmation (noun) [104]	Adopting gender-affirming hairstyles, clothing, name, gender pronouns, and restrooms and other facilities that an individual may take to live in greater alignment with their gender identity
Sexual orientation (noun) [101]	Term that characterizes pattern of romantic or sexual attraction to other people, independent of and different from gender identity

describe themselves as transgender or trans. Persons who face significant discomfort or distress with gender incongruence may experience gender dysphoria, defined as distress or impairment in functioning resulting from "a marked difference between the individual's expressed/experienced gender and the gender others would assign them." [6] Additional helpful terminology and suggested language for clinicians can be found in Tables 1 and 2.

3 | Gender Identity Development

Children may describe their genders as they learn language and culture. The timing of having a named and stable gender identity may vary in different cultural contexts. Many prepubertal children will explore their gender identity and expression and a subset (but not all) of those children will continue to identify as transgender [7, 8]. Gender identity can also emerge at other times of life throughout adolescence and adulthood [8] and is sometimes prompted by pubertal changes that may trigger gender exploration or dysphoria [9]. A gender identity that is insistent, consistent, and persistent into one's adolescent years often indicates a gender identity that will continue. While desistence occurs, it is rare after affirming changes such as social affirmation or medical care [10, 11].

Societal factors, including widespread cisnormativity, oppression, and discrimination, may also influence whether and how children, adolescents, and adults explore their gender. As with sexual orientation, attempts to "convert" people to a cisgender identity are considered harmful, with specific recommendations against this practice coming from organizations such as the American Academy of Pediatrics [12] and the United Nations Independent Expert on Protection against Violence and Discrimination based on Sexual Orientation and Gender Identity [13].

4 | Minority Stress, Barriers to Care, and Mental Health Disparities

Gender diverse people experience discrimination on individual, community, and structural levels in and outside of healthcare.

TABLE 2 | Examples of suggested language in clinical interactions to support affirming spaces for gender diverse youth.

Introductions	Tips and notes
"My name is [name] and I prefer [he/him, she/her, they/them, etc.] pronouns. What do you prefer to be called?" "I like to make sure that I'm calling everyone what they'd like to be called. I go by [name] and like people to call me [pronouns] when they are talking about me. What do you like to be called?"	• Use the name and pronouns that an individual identifies as appropriate in all interactions, whether the person that you are referring to is present or not. *The exception to this is in cases of confidentiality, when a person has not shared their gender identity, name, or pronouns with others. In that case, it is important to talk with the individual to make a realistic plan for if/when they would like chosen name and pronouns to be used* • Ask name and pronouns for everyone present, not just the young person • There are many pronouns! Some examples are: • He/him/his (masculine) • She/her/hers (feminine) • They/them/their (gender neutral) • Xe/Xem/Xyrs (gender neutral) • Ze/Hir/Hirs or Ze/Zim/Zir (gender neutral) • There are websites where you can practice with different pronouns, such as: https://www.minus18.org.au/ • If you are struggling with pronouns, it can be helpful to use a patient's name to lessen pronoun use • If you make a mistake related to name and pronouns, offer a brief and genuine apology, and move on
Questions about gender	
"How would you describe your gender identity?" "I ask all of my patients about their gender. Do you identify as male, female, non-binary, or another gender?"	• Adolescent patients may not have shared their gender identity with their family. It can be helpful to ask this question during a confidential social history even if it has already been asked with family members or other support people in the room • For forms and questionnaires, recommended practice is to ask about sex/gender through two steps: [31] • What was your sex assigned at birth? (Male, female, intersex, another sex) • What is your gender/gender identity? (open response) • Some recommendations include a question about legal sex as well [105]
Questions about sexuality/sex	
"What term do you prefer to describe your [chest, genitals, etc.]?" "How do you describe your sexuality? What does that term mean to you?" "Tell me about your attractions. Are you attracted to men, women, people of all genders, or none of these?" "Do you have sexual partners or people that you are intimate with?" "When you are having sex or being intimate, what body parts are touching other body parts?" OR "Have you ever had sex of any kind, including oral sex, vaginal sex, anal sex, hand-genital sex, or any other type? Do you know what all of those terms mean?" "What steps do you take to protect yourself when you are having sex or being intimate with someone?"	• While sexuality and gender identity are separate aspects of identity, part of creating an inclusive environment is asking about sex and sexuality in an affirming way • Anatomic terms can be important for accuracy but may cause gender dysphoria for some gender diverse patients. When possible, use the terms used by the patient • Be prepared to describe different types of sex if the patient is not familiar with your terminology • Keep in mind that oral sex may involve mouth-genital or mouth-anal contact and that penetrative sex may include penetration with a penis, hand, or sex toy • Gender diverse youth with a uterus may still become pregnant if they have penile-vaginal sex with a sperm-producing partner, even if they are on testosterone • Gender diverse youth with testicles may still produce sperm, even if they are on estrogen • Youth of all genders should have access to comprehensive, high-quality information about sex, sexual safety, tools for pregnancy and infection prevention, and pleasure that pertains to their bodies and experiences

Both gender diverse youth and adults report challenges and mistreatment when accessing medical care, such as misgendering or denial of their gender, refusal of care, verbal or physical abuse or harassment, and/or difficulty identifying and accessing affirming healthcare providers with experience in gender-affirming care [14–16]. Nearly a quarter of transgender adults report deferring needed care in the last year due to fear of mistreatment [14]. Gender diverse youth without family support may also be unable to access care given that parent/guardian consent is required. Additionally, multiple states in the United States have recently enacted legislation blocking youth access to this necessary care [17]. Worldwide, access to care is also highly

variable. In the European Union, for example, there is wide variability in the availability of gender-affirming care for people of all ages (not just children) across member states given the variation in laws and policies, coverage of care, cultural factors, and available practitioners [18].

Such examples of daily experiences of discrimination and oppression, in healthcare and out, lead to minority stress. Minority stress describes the experiences of discrimination, identity-based rejection and stigma, and victimization that may be associated with being a member of a socially stigmatized group. The Minority Stress Model posits that these continued experiences lead to inequities in mental health [19, 20], including increased rates of depression, anxiety, eating disorders, and suicidal behavior compared to cisgender peers [21–23]. Given what is known about the negative impact of mental health challenges on kidney transplant outcomes in the general population [24, 25], it is likely that addressing factors that contribute to depression, anxiety, and other mental health concerns in gender diverse youth may improve transplant outcomes [26]. The Minority Stress model also explains inequities in physical health in gender diverse populations, such as increased human immunodeficiency virus (HIV) infection risk. While discussion of sexually transmitted infection (STI) risk and management in adolescent transplant patients is discussed elsewhere [27], individualized risk assessment and understanding the role that minority stress can play in STI acquisition is critical, as such infections could have a significant impact in a transplant patient.

Importantly, there are factors that can mitigate the impact of minority stress. Resilience factors for gender diverse youth include family connectedness and support and positive school factors (perception of safety, belonging, and climate) [20]. Gender-affirming care, including both medical care and the use of name and pronouns, is also associated with improved mental health: depression, suicidal ideation, and suicidal behavior were all lowest among transgender youth using their name and pronouns across multiple contexts [28]. Among gender diverse youth that hoped for gender-affirming hormone therapy (GAHT), use of GAHT was associated with lower odds of recent depression and seriously considering suicide compared to gender diverse youth who wanted but could not access this care [29]. With family, community, and school support and medical therapies when appropriate, gender diverse youth are often able to thrive.

5 | Affirming Care in Clinical Settings

While the transplant team may not provide gender-affirming medications or surgeries, there are several steps that team members can take to affirm gender diverse patients. Guidelines and toolkits can be useful for teams or systems looking to create more inclusive environments (Table 3). A fundamental step is creating a workflow such that all members of the team use appropriate names and pronouns and avoid gendered terms, such as “ma'am,” “sir,” “princess,” or others. Many electronic medical records have a means of recording preferred names and pronouns; team members should be trained to ask for and document preferences for all patients. Within organizations, advocacy around the representation of gender diverse people in advertising or décor and inclusive bathroom and changing spaces can help signal safety and affirmation on a larger scale. Any clinical paperwork should use a two-step method to record sex/gender by asking about sex assigned at birth (male/female/intersex/other) and gender identity (including a write-in option) [30, 31]. Team members should model affirming care practices and, when necessary, gently clarify if parents or guardians are using the incorrect name or pronouns, while continuing to use appropriate names and pronouns if the patient has requested it.

In coordinating clinical care, team members can provide clear and pre-emptive communication when ordering studies or referring to specialists. In addition, it may be important for transplant team members to identify barriers for gender diverse youth that may complicate their medical care. For example, if a patient has a required fluid minimum as part of their treatment plan, it may be important to discuss access to safe school bathroom options with the young person and, with family permission, advocate within the school for a plan to promote the greatest level of gender affirmation and safety.

As is the case for all adolescents, creating space for confidential communication is critical for gender diverse youth [27]. Youth may first share their gender identity or exploration with providers before discussion with their parents. Team members can and should maintain confidentiality around identity, name, and pronouns when the teen requests it, which may involve avoiding documentation in the electronic medical record. The healthcare team can help to create strong and affirming connections by clarifying and setting expectations for what this will mean for how the teen is addressed as they move through the healthcare system.

Transplant team members also can be strong advocates in connecting gender diverse youth and their families with gender-affirming medical care. Referral to pediatricians, pediatric endocrinologists, or adolescent medicine specialists with experience in gender-affirming care can help facilitate further exploration of how to support the young person and their family. Many communities also have strong parent and youth support networks; local chapters of national organizations such as PFLAG (www.pflag.org) may be a reliable first step to helping families identify safe and affirming support spaces.

6 | An Overview of Clinical Gender-Affirming Care for Transplant Teams

Pediatric gender-affirming care has emerged over the last several decades as an important tool in improving quality of life and mental health for transgender, nonbinary, and gender diverse youth. It is important to emphasize that not all gender diverse youth will desire or require gender-affirming medical care, and the types of care that they engage in will vary based on their individual gender experience and myriad other personal factors. Additionally, clinical care teams may meet gender diverse youth at different points in their gender journey from the time of initial gender exploration to affirmed youth that may have socially transitioned or been on gender-affirming medications for years. Medical teams should be prepared to ask open-ended questions about a young person's hopes and goals for their gender journey as well as their family's thoughts and perspectives, without either over-medicalizing gender or withholding access to care.

TABLE 3 | Gender diversity resources for clinical team members.

National LGBTQIA+ Health Education Center https://www.lgbtqiahealtheducation.org/	Free online educational resources for a large range of topics related to LGBTQIA+ Health, including webinars, glossary, and publications. Many are CME eligible. This specific guide may be helpful for teams getting started on creating inclusive environments: Providing Inclusive Services and Care for LGBT People: A guide for health care staff. https://www.lgbtqiahealtheducation.org/wp-content/uploads/Providing-Inclusive-Services-and-Care-for-LGBT-People.pdf
UCSF Center of Excellence for Transgender Health https://prevention.ucsf.edu/transhealth/training	Free online trainings on subjects such as acknowledging sex and gender
American Academy of Pediatrics Healthychildren.org	Policy Statement: "Ensuring Comprehensive Care and Support for Transgender and Gender Diverse Children and Adolescents," published in 2018 Patient and family-facing materials in English and Spanish; resources available such as "Gender Diverse & Transgender Children"
Human Rights Campaign—Supporting & Caring for Gender Diverse Youth https://www.hrc.org/resources/supporting-caring-for-transgender-children	Explains how families and healthcare professionals are helping transgender children thrive; produced with American Academy of Pediatrics and other professional organizations.
The Joint Commission Advancing Effective Communication, Cultural Competence, and Patient- and Family-Centered Care for the Lesbian, Gay, Bisexual, and Transgender (LGBT) Community: A Field Guide https://www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/health-equity/lgbtfieldguide_web_linked_verpdf.pdf	While published back in 2011, this field guide explores wait to create affirming clinical space for LGBTQ+ people throughout healthcare systems
Trans Europe and Central Asia https://www.tgeu.org/	A trans-led non-profit for the rights and wellbeing of trans people in Europe and Central Asia. Their website has information about legal gender recognition, health and depathologisation (including the state of trans-specific healthcare in the European Union), protection from violence and hate, and resilience against the anti-gender movement. Their "Guidelines to Human Rights-based Trans-specific Healthcare" outlines the principles that support access to care for trans people internationally
Gender Identity Research & Education Society (United Kingdom) https://www.gires.org.uk/	GIRES is a charity whose aim is to work to help the trans and gender non-conforming communities including those whose preferred expression is non-binary and non-gender. They offer both in-person and online trainings related to affirming spaces, including Gender Diversity Training for Primary Care Teams
The World Professional Association for Transgender Health (WPATH) https://www.wpath.org	The World Professional Association for Transgender Health (WPATH) is a 501 (c) [3] non-profit, interdisciplinary professional and educational organization devoted to transgender health. Their mission is to "promote evidence based care, education, research, public policy, and respect in transgender health." Their website includes information about membership, free access to the most recent clinical care recommendations (Standards of Care 8) published in 2022, and information about conferences for healthcare professionals

6.1 | Gender-Affirming Care Teams

While integration of gender-affirming medical care into transplant care would be ideal for many gender diverse patients, it is likely not feasible for most institutions. Transplant teams should help build a comprehensive healthcare team for their patient, including primary care or specialty healthcare providers with experience in gender-affirming care and affirming mental health support. Transplant teams should be familiar with the availability of gender-affirming care and laws that may impact their patients' access to this important care. Care teams should also include access to care for the youth's needs related to risk behaviors, including sexual and reproductive health, and resources to address barriers to care, such as social work support. As in all pediatric and adolescent care, incorporating the understanding of a young person's social history and risk factors

with confidential interviews can help establish rapport, provide greater context for understanding, and lead to more comprehensive care that addresses areas such as eating disorders, sexual health, and mental health.

6.2 | Nonmedical Care

Many gender diverse youth may use non-medical tools to affirm their gender. This may include choices about clothes, hair, name, and pronouns as well as tools to change the shape or appearance of their body. Chest binding, chest padding, genital tucking, or genital packing are additional strategies used by gender diverse youth. Chest binding uses compressive garments or specialized tape to make the chest appear flatter in people with breast tissue [32]. Though use of well-fitting, high-quality binders with uniform compression are thought to help minimize musculoskeletal changes from products that lead to uneven compression, such as ace bandages, a majority of youth that bind still report that they have had chest or back pain with this practice [32]. Tape made specifically for binding aims to limit rashes or skin changes that may occur with other adhesives and gives an option for binding that is not circumferential. Patients who depend on use of a binder to address their gender dysphoria could struggle if they are unable to use those garments due to medical equipment, such as a port, peritoneal dialysis catheter, or g-tube, or incisions, such as thoracotomy or abdominal scars. In these cases, a cropped style of binder or use of tape for binding may be an appropriate replacement. Chest padding or the use of breastforms to enhance the appearance of breast tissue carries few risks, though may contain silicone, which can rarely cause irritant or contact dermatitis.

Genital tucking involves manipulation of the penis, testicles, and scrotum to produce a smoother contour on the front body. This can be achieved in several ways, including use of compressive undergarments or gaffs (which contain a sleeve to help hold the penis in a tucked position) or the use of medical tape to keep testicles in the inguinal canal and the penis and scrotum in a tucked position between the buttocks [33]. Other types of tape, including duct tape, should be avoided given that they can tear pubic hair and cause skin rashes. It is important that individuals know that penile or testicular tissue should never be twisted in the process of tucking, as this could lead to ischemia. While the risks of tucking are not well described, people cannot urinate while tucking with tape [34], which may lead to dysfunctional voiding and may be challenging in patients who have a minimum daily fluid goal. Surveys of gender diverse people that tuck show that they attribute testicular pain, rashes, and urinary tract infections to the practice [33, 35], which may be of particular note for patients on immunosuppression or with kidney transplants. Genital packers are used to create a bulge in the genital area and stand-to-pee devices are externally applied devices that may be used by youth assigned a female sex at birth to be able to urinate while standing; neither carry significant health risks if used appropriately.

6.3 | Puberty Blockers

Gonadotropin-releasing hormone (GnRH) analogs, also called "puberty blockers," can be an important reversible tool for peripubertal transgender or gender diverse patients to prevent or delay irreversible changes from puberty. GnRH analogs are most often delivered as an intramuscular (IM) or subcutaneous injection of leuprolide every 1–6 months (though other formulations are available) or a histrelin implant, which is inserted subcutaneously in the upper arm and can remain in place for 1–2 years [36]. These medications should not be initiated prior to the onset of puberty (Sexual Maturity Rating 2) [37, 38] and are most effective early in puberty, prior to permanent changes such as significant breast/chest development or deepening of the voice. The pediatric leuprolide formulation package insert lists common side effects as injection site reactions, headache, emotional lability, and hot flashes [39]. The World Professional Association for Transgender Health (WPATH) recommends a team-based and coordinated care approach in considering puberty blockers for gender diverse youth and recommends that patients meet the following criteria prior to initiation: (1) diagnosis of gender incongruence, if appropriate and necessary based on geographic context; (2) sustained gender dysphoria or diversity over time; (3) appropriate emotional and cognitive maturity for assent or consent to treatment; and (4) discussion of impact on fertility (of puberty blockers followed by hormone therapy) [37]. This medical care is only initiated with parent/guardian consent in accordance with local legislation. Pubertal blockade for transgender youth at Sexual Maturity Rating 2 or 3 has been associated with significantly lower self-report scores in internalizing problems, anxiety, depression, and stress; youth were also less likely to report suicidal ideation [40]. Transgender adults who had received puberty blockers earlier in life had a lower risk of lifetime suicidal ideation compared with those who had not received this medication [41].

6.4 | Menstrual Management

Menstrual management can play a significant role in addressing gender dysphoria in gender diverse youth assigned a female sex at birth who are not on puberty blockers. Medical menstrual management in common in pediatric gender clinics and can be achieved through use of combined oral contraceptives, progestin-only pills, medroxyprogesterone injections, and hormonal implants or IUDs [42, 43]. As described well elsewhere in this special issue, it is important to consider whether patients are appropriate candidates for estrogen-containing forms of contraception or menstrual management as particular situations in transplantation preclude us of estrogen [27]. It is also important to note that menstrual management medications may also serve as means of pregnancy prevention for gender diverse patients, which monotherapy testosterone does not provide [44].

6.5 | Hormone Therapy

GAHT consists of estradiol to feminize and testosterone to masculinize. Like puberty blockers, hormone therapy may be initiated in gender diverse adolescents by a medical provider experienced in pediatric gender care per WPATH guidelines if they have a diagnosis of gender incongruence, demonstrate sustained gender dysphoria/diversity, can demonstrate emotional and cognitive maturity for consent to treatment, and if there has been discussion of impact on fertility [37]. This medical care is

only initiated with parent/guardian consent in accordance with local legislation. The level of emotional and cognitive maturity needed for decisions about hormone therapy may be higher than for puberty blockers, given that hormone therapy has partially irreversible effects. Perhaps with this in mind, the Endocrine Society Guidelines specifically recommends the involvement of a mental health provider in evaluation [38]. Initiation of hormone therapy, as with all medications, should take into account the young person's medical history and active health issues as well as family or genetic risk factors that could influence risk of conditions such as cancer, hypertension, and heart disease. Importantly, gender-affirming hormone therapy in pediatric patients is consistently associated with improved mental health outcomes and quality of life as well as low levels of regret [11, 45, 46].

Estradiol is available as pills, patches, and injections and leads to changes including irreversible breast development, reversible change in body fat distribution, and decreased androgen effect if androgen levels are not otherwise suppressed by puberty blockers [38]. Suppression of androgen effects includes less and slower growth of body and facial hair, fewer erections, and decreased sperm count. Androgen-blocking agents, such as spironolactone, are often concurrently prescribed if the patient is not on a GnRH analog. A full discussion of risks of estrogen highlights the thromboembolic and cardiovascular risks of estrogen, consideration of breast cancer risk, and impact on fertility, among other factors. Though progestins are also sometimes used concurrently with estrogen with the goal of enhancing breast development, data supporting this outcome is scant and these medications may further increase thromboembolic risk [47].

Testosterone is typically given via IM or subcutaneous injection or gel; testosterone pellets are less commonly used and oral options for testosterone are emerging [48] but not widely available due to cost and coverage limitations. Testosterone leads to irreversible changes of deepening of the voice and Adam's apple development, clitoromegaly, and thicker and darker facial and body hair. Reversible changes include change in fat distribution and menstrual cessation. While gender diverse people who have used testosterone have become pregnant and had healthy pregnancies following testosterone use [49], the overall range of impact on fertility is unclear. Testosterone should not be considered contraception; other contraceptives should be used if there is a goal of preventing pregnancy. Pregnancy while using testosterone is to be avoided as it is a teratogen. Primary risks of testosterone include polycythemia, increased blood pressure, cholesterol changes, acne, and androgenic hair loss.

6.6 | Surgical Interventions

Gender-affirming surgeries may be later interventions for some, but not all, gender diverse youth. Many procedures fall into this category, including but not limited to facial feminization, tracheal shave (chondrolaryngoplasty), top surgery (mastectomy), breast augmentation, hysterectomy, orchiectomy, vaginoplasty, metoidioplasty, and phalloplasty. Hormone therapy is recommended prior to surgery in some cases if it is desired and could play a role in the clinical outcome (such as estrogen prior to breast augmentation or testosterone prior to metoidioplasty) [37]. Guidelines for when to undertake gender-affirming surgeries are similar for hormone therapy [37], though reaching the age of consent may also be required in many states, countries, or institutions.

7 | Medical Considerations in Gender Diverse Adolescent Transplant Patients

While general approaches to affirming gender identity in all patients are well outlined above, there are specific medical considerations that may arise in gender diverse adolescent transplant patients. For example, interpretation of labs and studies may rely on sex designation, which can raise confusion about results. There are also side effects of immunosuppression which may be particularly unfavorable or distressing to transgender patients and should be discussed prior to transplant. For example, tacrolimus, a calcineurin inhibitor and cornerstone of immunosuppressive regimens for pediatric transplant patients, can cause hair loss, which may trigger gender dysphoria, particularly for transfeminine patients or nonbinary patients assigned a male sex at birth. The use of glucocorticoids in post-operative management and with rejection episodes can cause weight gain and Cushingoid changes which may impact body image and gender dysphoria [50]. Here, kidney transplantation in gender diverse adolescents will be used as a framework for identifying considerations that may arise in gender diverse adolescent solid-organ transplant (SOT) recipients as a whole.

7.1 | Monitoring Kidney Function in Transgender Recipients

In pediatric kidney transplant, serum creatinine (sCr) and glomerular filtration rate (GFR) are among the most important values for monitoring health of the graft both in the immediate post-operative period and in long term follow-up. Rise in creatinine (Cr) in transplant patients can signal a variety of diagnostic possibilities including graft rejection, dehydration, urinary obstruction, infection, calcineurin-inhibitor toxicity, or recurrence of primary kidney diseases such as glomerulonephritis [51]. However, emerging data suggest that use of sCr and current estimated GFR (eGFR) equations in transgender patients may present clinical challenges in kidney transplant recipients for whom accurate kidney function monitoring is essential.

Cr is generated from enzymatic breakdown of creatine primarily made by skeletal muscle, and thus can vary with age and sex due to differences in body composition [51]. These differences have been accounted for in eGFR equations by using factors such as age and sex as bio-identifiers, including the CKiD U25 eGFR equation validated for pediatric patients [52]. Estimating GFR equations represent population averages for individuals with a given sex, age, and GFR, and therefore can over- or underestimate GFR for patients who fall outside of those population averages [53]. This is particularly highlighted in transgender patients, for whom sex and body composition represent a more complex relationship than may be captured with eGFR.

First, an obvious but notable barrier to using eGFR equations in the transgender population is that they have never been validated explicitly in transgender patients or for patients utilizing GAHT [54]. Second, it has been often hypothesized that the use of GAHT, which has an effect of changing skeletal muscle composition for transgender patients, may impact intrinsic Cr generation. In a systematic review by Krupka et al. in 2022, the use of gender-affirming therapy for adult transgender men increased sCr by an average of 0.15 mL/dL over a 1-year period and decreased sCr by 0.05 mL/dL for adult transgender women [55]. Another review by Collister et al. reported an average increase in sCr of 5–10 μmol/L in adult transgender men [54]. There is limited data on the impact of GAHT on sCr in pediatric patients; however, a 2022 prospective observational study of 286 transgender youth presented findings suggesting that after 12 months of GAHT, patients had a similar Cr to cisgender youth of the same anticipated sex hormone profile [56]. In addition to GAHT impacting sCR due to changes in body mass, it has been theorized that testosterone may also cause a decline in GFR independent of changes in muscle mass, though supporting data for this is limited [57, 58].

sCr is not the only biomarker used in determination of kidney function or in eGFR equations. Cystatin C is an alternative biomarker that is not influenced by muscle mass, age, or sex [53]. Because it is not produced from muscle, cystatin C has been particularly useful in determination of kidney function in patients with extremely low or high body mass. Examples of pediatric patients might fit these categories includes those with neuromuscular diseases and athletic teenagers, respectively [53]. In addition, the CkiD U25 equation can be performed utilizing cystatin C or both cystatin C and sCR when appropriate [52]. Because it is not influenced by muscle mass and sex, some have hypothesized that cystatin C would have utility in determination of kidney function for transgender individuals [54, 56, 57], though there have been no direct studies of cystatin C in this population [54, 55].

The above challenges in the determination of kidney function in the transgender population have led to many approaches for determining GFR for these patients, many of which could be applicable to transgender kidney transplant recipients on gender-affirming hormone therapy. One approach supports utilizing both sexes in eGFR equations for patients who have been on GAHT for more than 6 months, allowing the clinician to calculate a range of eGFR for a given patient [54, 57]. Another approach in the determination of eGFR in patients on GAHT is to utilize their gender, given that studies have shown sCr approaches that of cisgender age-matched counterparts after 12 months of medical therapy [56]. In patients who are not yet on GAHT, it is generally accepted to use eGFR reference ranges for that person's sex assigned at birth [54]. In instances where the exact GFR is essential to clinical decision making (e.g., in preemptive kidney transplant or candidacy as a living kidney donor), measured GFR studies using iohexol can be useful [53, 54]. In a 2024 review, *A Holistic Framework for the Evaluation of Kidney Function in a Gender Diverse Landscape*, Miranda et al. also emphasizes the use of other indicators of kidney function such as proteinuria and albuminuria in addition to sCr for patients on GAHT [57]. Further research into validated eGFR equations for transgender patients and investigation into GAHT and its impact on biomarkers of kidney function are necessary for the complete care of these patients.

7.2 | Gender-Affirming Medical Therapy and Kidney Transplant

7.2.1 | GnRH Analogs

Interactions, risks, and side effects of GnRH analogs should be interpreted in the context of the limitations of the evidence available. GnRH analogs are used for gender-affirming care as well as treatment of central precocious puberty, endometriosis, and prostate cancer [59], and risks from all patient groups maybe listed together, though the ages and comorbidities of the patient likely play a significant role in the risks of the medication. For example, leuprolide-induced hypogonadism has been associated with QT prolongation in adult prostate cancer patients [60] but this has not been shown in studies of gender diverse youth [61]. However, kidney transplant patients may have several identified factors that may increase the risk of QT prolongation, including electrolyte abnormalities, kidney or liver impairment, receipt of multiple QT-prolonging medications, and loop diuretic use [62], in which case baseline and intermittent electrocardiogram assessment may be appropriate during leuprolide therapy.

The long-term impact of GnRH analog therapy on bone density in gender diverse youth is an area of much ongoing research and debate. The research is complicated both by different sex reference standard used in bone health measurements (in dual-energy X-ray absorptiometry (DEXA) interpretation, for example) and the fact that gender diverse youth also have lower than expected bone mineral density (BMD) prior to initiation of any medication [63]. Given that kidney transplant recipients may also have risk factors for osteopenia, such as decreased Vitamin D activation and prolonged steroid use, consideration of bone health warrants special attention. GnRH analogs have the expected impact during their usage of decreasing markers of bone turnover and measures of bone density [64]. Studies show mixed results if GnRH therapy is followed by hormone therapy, though it seems clear that transfeminine people and other gender diverse people assigned a male sex at birth may be at particular risk. For example, while studies show that transgender men on GAHT after puberty blockade often regain their BMD to levels similar to prior to therapy, young transgender women who had been on GnRH analog monotherapy followed by hormone therapy showed lowering of BMD z scores (with reference of sex assigned at birth) from prior to therapy to age 22 [65]. A 2023 study showed that BMD z scores in transgender men and women treated with GnRH therapy followed by hormone therapy caught up to pretreatment BMD levels in all measured areas except the lumbar spine in people assigned male sex at birth [66]. Though additional longitudinal data is needed to better understand BMD and GnRH analogs, it is prudent to consider all BMD risk factors for each patient, monitor and maintain Vitamin D sufficiency, limit the duration of GnRH analogs as a monotherapy, and monitor BMD, particularly in high-risk patients. The Endocrine Society 2017 guidelines recommend considering DEXA scan every 1–2 years during puberty blockade, induction of puberty, and into young adulthood (age 25–30 years old or until peak bone mass has been reached) [38].

7.2.2 | GAHT and Peri-operative Considerations

Gender-affirming hormones and surgery are critically important therapies for many transgender patients. However, the use of these therapies in the setting of kidney transplant is understudied and presents a unique clinical challenge for transplant teams to consider. GAHT has implications both for graft health and in potential interactions with common immunosuppressive medications.

7.2.2.1 | Estrogen and Anti-androgen Medications. For transgender patients on estrogen therapy, one of the most concerning side effects of estrogen in the setting of kidney transplant is the development of thromboembolism [50]. Much of this risk estimation is derived from studies of cisgender women on estrogen replacement therapy. While limited studies do show increased thromboembolic risk for transgender people receiving estrogen [67, 68], minority stress factors are also likely players in addition to GAHT [69]. Notably, the type of estrogen associated with the highest risk of thrombotic events is ethinyl estradiol, which the 2017 Endocrine Society Guidelines specifically recommended against using as GAHT [38]. A 2022 case report of an adult transgender woman undergoing a combined kidney-heart transplant reported the development of deep vein thrombosis with risk factors including estrogen use and prior history of clot [70]. Thrombus risk is also heightened in certain populations of ESKD patients including patients on peritoneal dialysis, severe nephrotic syndrome, and prolonged cold ischemia time [51]. Graft thrombus is a common post-surgical complication and has devastating consequences, leading to graft failure or transplantectomy in majority of cases [71–73].

Due to the potential for graft loss with the development of graft thrombosis, many approaches to kidney transplant in transgender woman recommend holding estrogen perioperatively [54, 74]. In a 2020 case series of four transgender adults receiving kidney transplant, two transgender women were advised to hold estrogen 12 weeks prior to and 9 weeks following surgery [74]. However, it is important to note that withholding GAHT may have deleterious mental health consequences during an already stressful peri-transplant period. Open communication and careful shared decision-making with the patient on the risks, benefits, and additional tools available (such as androgen-blocking medication to prevent masculinization) are necessary when navigating this decision. In other settings, the risk of thrombus is higher with the use of oral estrogen compared to transdermal [75], which has led to hypothesis that transdermal route may be safer for transplant patients. This has not, however, been investigated in large studies of transgender women on different formulations of hormone therapy [76]. In an approach by Lee et al., the care team opted to transition their patient from IM to transdermal estrogen at the lowest dose immediately prior to transplant, though the patient developed a deep vein thrombosis (DVT) post-operatively and all GAHT was therefore discontinued for 3 months post-transplant [70]. It is important to mention that while contraception is recommended for transplant patients due to the increased risk of perinatal complications during kidney transplant, the CDC recommends against the use of estrogen-containing combined hormonal contraception for patients undergoing a complicated SOT, which includes patients with graft failure, rejection, or allograft vasculopathy [77]. It may also be true that some transplant patients on GAHT would be at higher risk for estrogen-associated side effects depending on their medical complexity, and thus individualized assessment of risk and benefit offers the best care for these patients.

7.2.2.2 | Testosterone. Testosterone is a known stimulus for erythrocytosis and carries a potential side effect of polycythemia [78]. An increase in hematocrit can be seen as soon as 1 month after initiation of testosterone [79]. Secondary polycythemia poses a potential risk of venous thromboembolism, though there is conflicting supporting evidence for this [79]. However, given the potential risks associated with polycythemia, the Endocrine Society 2017 guidelines recommend periodic monitoring of complete blood counts (CBCs) for transgender men to avoid potential adverse events from polycythemia, which they designate as the only very high-risk adverse outcome of testosterone [38].

Kidney transplant patients are also at risk for post-transplant erythrocytosis (defined as hematocrit > 50%–52%), which has been estimated to occur in as many as 10%–20% of kidney recipients, typically in the first 2 years after transplant [80]. Adverse outcomes of post-transplant erythrocytosis include thrombosis, headache, fatigue, and increased mortality [81, 82]. Additionally, a 2008 retrospective study of 511 adult kidney transplant recipients reported an increased risk of graft loss with the development of post-transplant erythrocytosis [80]. Risk factors for post-transplant erythrocytosis include male sex, younger age at transplant, adequate erythropoiesis prior to transplant, and patients with a well-functioning graft; a review by Alzoubi et al. also lists androgens as a potential contributing factor [82].

With both the use of testosterone and kidney transplant increasing risk of polycythemia, clinicians may have concerns with using testosterone perioperatively. Of the available case studies of transgender men receiving kidney transplant, one patient who stopped IM testosterone injections perioperatively developed side effects including resumption of menses prompting reinitiation of testosterone therapy and did not develop post-transplant erythrocytosis (rather, the patient suffered from anemia post-operatively) [74]. Another report of a 41-year-old transgender man on testosterone therapy had no major complications for 1 year post-transplant, though the authors did not comment specifically on polycythemia [83].

Many approaches could be considered for patients on GAHT who develop or are at risk for post-transplant erythrocytosis. Conservatively, clinicians could pre-emptively stop or lower the testosterone dose perioperatively, especially in high-risk patient populations. Alternatively, the team could decide to monitor CBC more frequently to identify intervention points in a timely manner. Per the 2009 Kidney Disease Improving Global Outcomes (KDIGO) guidelines, patients may also be placed on an angiotensin-converting enzyme inhibitor or angiotensin receptor blockers to treat polycythemia, but no studies exist in the concurrent use of GAHT for these patients [81].

Even in the absence of polycythemia, interpreting the CBC in a patient on GAHT may present clinical challenges when deciding on an appropriate reference range to use. In a 2019 study of 172 adults on hormone therapy, hematology parameters including

CBC were consistent with cisgender values of the same hormone profile [84]. Patients in the testosterone cohort had a higher average hemoglobin, hematocrit, and red blood cell count than patients in the estrogen cohort, with calculated hemoglobin reference intervals of 11.6–15.7 for patients taking estrogen and 13.0–18.0 for patients taking testosterone [84]. There are no similar studies for pediatric patients; however, this work again highlights the utility in interpreting laboratory values with reference ranges that match that patient's hormone profile rather than their sex assigned at birth or gender marker alone.

7.2.2.3 | Interactions Between GAHT and Immunosuppression. Patients who receive a kidney transplant will be on immunosuppressive medications for the duration of their graft and sometimes afterward if their graft fails. Though the side effects of immunosuppression medications and GAHT are well studied individually, there are no studies for patients on combination therapy. Nevertheless, it is important for both the transplant team and the patient to understand the side effects of immunosuppression and anticipate potential interactions with hormone therapy. One of the most common immunosuppressants, tacrolimus, has the potential for several interactions with GAHT. Spironolactone carries a small risk of hyperkalemia, which may be potentiated with tacrolimus [58, 74]. Additionally, both tacrolimus and testosterone therapy carry a risk of hypertension [50]. Finally, estrogen is a CYP3A4 inhibitor and may impact metabolism of immunosuppressives such as tacrolimus, sirolimus, and cyclosporin [27, 85].

Table 4 shows the adverse effects of common immunosuppressive medications and GAHT as well as potential interactions between the two.

7.2.2.4 | Other Considerations for Patients Receiving GAHT. In addition to potential interference with graft health and interaction with immunosuppression, the transplant nephrologist should consider other side effects of GAHT that may impact kidney health. For example, use of testosterone in transgender men has been shown to increase blood pressure within 2–4 months after initiation of therapy, persisting for the duration of treatment [86]. This may compound the already elevated risk of hypertension in patients receiving kidney transplant, which is associated with increased risk of cardiovascular disease and graft dysfunction in pediatric patients [87]. The data for association of estrogen with hypertension is conflicting, but one retrospective study of 149 transgender women on estrogen

TABLE 4 | Major side effects and drug–drug interactions of gender-affirming hormone therapy and immunosuppressive agents. Reprinted from *The Lancet Gastroenterology and Hepatology*; 8(12); Lee TH, Duong N, Sutha K, Simonetto DA, Paul S; "Liver transplantation for people of minoritised sexual and gender identities in the USA"; p. 1152-1162, 2023, with permission from Elsevier.

	Corticosteroids • Diabetes • Hyperlipidaemia • Hypertension • Weight gain • Worsening psychiatric condition • Osteoporosis • Acne • Oedema • Hirsutism	**Tacrolimus** • Renal dysfunction • Hyperkalaemia • Hypomagnesaemia • Diabetes • Hyperlipidaemia • Hypertension • Weight gain • Osteoporosis • Headache • Tremor • Seizure • Hair loss	**Ciclosporin** • Renal dysfunction • Hyperkalaemia • Hypomagnesaemia • Diabetes • Hyperlipidaemia • Hypertension • Weight gain • Osteoporosis • Headache • Tremor • Seizure • Hirsutism • Gingival hyperplasia	**Mycophenolic acid** • Myelosuppression • Diarrhoea • Teratogenic (contraceptive needed, including transgender men)	**mTOR inhibitor** • Myelosuppression • Proteinuria • Hypertension • Dyslipidaemia • Delayed wound healing after surgery, including gender-affirming surgery
Oestrogen • Venous thrombosis • Cholelithiasis • Increased liver enzymes • Weight gain • Hypertriglyceridaemia	• Might increase the blood level of corticosteroids	• Might increase the blood level of tacrolimus	..	..	..
Testosterone • Polycythaemia • Weight gain • Acne • Hair loss • Sleep apnoea • Increased liver enzymes • Cardiovascular disease • Hypertension	• Worsening acne • Worsening fluid-retaining effect	• Worsening hair loss • Worsening hypertension	• Might increase the blood level of ciclosporin • Increased liver enzymes reported	..	• Worsening hypertension • Worsening acne with sirolimus
Other medications for gender affirming care	• Worsening osteoporosis with aromatase inhibitor	• Worsening hyperkalaemia with spironolactone • Worsening osteoporosis with aromatase inhibitor	• Worsening osteoporosis with aromatase inhibitor	• Can inhibit progesterone	..

showed an increase in incidence of hypertension in transgender women compared to the general population [88].

Estrogen therapy in cisgender women may increase the risk for albuminuria and proteinuria [57]. A 2001 case–control study of over 4000 cisgender women using estrogen both for contraception and for post-menopausal hormone replacement showed an increased odds ratio in the development of albuminuria with the use of combined oral contraceptives (ethinyl estradiol and progestin) and estrogen replacement therapy (conjugated estrogens, estradiol, or estradiol valerate) [89]. However, a 2018 study of post-menopausal cisgender women on oral conjugated estrogen reported a decrease in risk of albuminuria with the use of hormone therapy for 1 month, though this study excluded patients with kidney disease and over 75% of study participants carried a diagnosis of hypertension [90]. It is important to note that estrogen used for contraception (often ethinyl estradiol) is different from estrogen for GAHT (typically 17-beta-estradiol), making it difficult to extrapolate these findings to transgender women or other gender diverse patients taking estrogen. While estrogen use for GAHT is more similar to that of post-menopausal hormone replacement, post-menopausal cisgender women represent an older population with more potential comorbidities than pediatric transgender transplant patients. Data on the development of proteinuria and albuminuria in transgender patients on GAHT is needed, especially given that development of proteinuria is an important marker of kidney function and that proteinuria can signal complications such as recurrence of primary disease or rejection in transplant patients [91]. Additionally, the use of mTOR inhibitors can cause proteinuria [92]. There is an association with development of proteinuria and graft survival and loss in adult populations, and pediatric data on this relationship is forthcoming [91].

An androgen blocker, such as spironolactone, is usually provided with estradiol if the individual is not on a GnRH agonist but may not be an option in transplant patients with other risks for hyperkalemia. Bicalutamide has also gained popularity in recent years as an androgen-blocker with promising introductory research in gender diverse youth [93] despite the known rare risk of fulminant liver failure in adult prostate cancer patients [94]. However, a recent case report of hepatic toxicity without liver failure thought to be related to bicalutamide in a transgender teenage girl [95] may be a salient reason to avoid this medication in patients receiving transplant until additional research is available.

7.2.3 | Gender-Affirming Surgery and Kidney Transplant

Gender-affirming surgery in the kidney transplant recipient is complex, with many intersecting factors that can influence either procedure's success. In a 2024 systematic review of complications of gender-affirming phalloplasty, 47% of patients had complications including urinary retention and failure of catheter drainage and 30.7% had urinary tract infection (UTI) or pyelonephritis [96]. Rates of genitourinary complication are lower in vaginoplasty, with a 2023 systematic review of over 3000 patients showing a reported UTI range of 0%–15% with a pooled average of 5.6% [97]. To the best of our knowledge, no studies have reported the rate of acute kidney injury secondary to urinary tract obstruction after gender-affirming surgery, though this is also a potential risk to be considered as repeated episodes of acute kidney injury (AKI) can impact graft function and survival.

Additionally, there is limited data on the impact of these surgeries on transplant outcomes and no clear consensus on how to advise patients wishing to undergo both kidney transplant and gender-affirming surgery. A single case report by Kosoku et al. in 2023 describes a 41-year-old transgender male who experienced metoidioplasty complications of urethral stenosis and acute kidney injury requiring the creation of a fistula during transplant for ease of urinary catheterization several years prior to transplant; he was able to undergo kidney transplant without complication [83]. In another case series by Ramadan et al., one patient who underwent phalloplasty after becoming a living kidney donor developed urethral stricture and subsequent AKI that was attributable to the modification in anatomy [74]. In the same case series, another transplant recipient underwent gender-affirming surgery and developed complications of lymphadenopathy and infection requiring a delay in transplant and surgical debridement [74]. These risks highlight the need for patients and transplant teams—and surgical specialists in particular—to maintain open communication regarding future plans for gender-affirming surgery as well as realistic expectations and possible complications.

8 | Other Solid Organ Transplants

Although this review has focused on kidney transplant, the clinical considerations provided may be used as a framework for the management of transgender patients receiving other SOTs. For example, precise laboratory monitoring is essential in all SOT patients, especially as cardiac and liver transplant patients may be at increased risk for post-transplant acute kidney injury. In liver transplant, the Model for End-Stage Liver Disease (MELD) allocation system also uses sCr as one parameter of the score, which has been shown to disadvantage cisgender women [85, 98]. In an updated version, MELD 3.0, the United Network for Organ Sharing (UNOS) took steps to alleviate disparities for gender diverse patients by giving additional points to female candidates and allowing the provider to determine the sex used in the MELD score in addition to sex assigned at birth, decreasing disparities for transgender women receiving GAHT who may be disadvantaged similarly to cisgender women [99]. However, this tool becomes exceedingly complicated in transgender patients who identify as non-binary or who are not on hormone therapy [99].

Additionally, the interaction of GAHT with immunosuppression and the potential impact on graft health can be considered with all SOT. For example, Lee et al. reported the first and only published case report to date of a transgender patient receiving a cardiac transplant, a successful heart-kidney transplant in a transgender adult woman. This patient experienced complications including a DVT and pericardial effusion necessitating prolonged holding of GAHT [70]. It is unclear whether cardiac transplant may require specific protocols related to GAHT given the unique thrombotic risks.

9 | Clinical Conclusions

This culmination of data, and lack thereof, regarding both kidney and non-kidney SOT highlights important themes for the clinical management of transgender patients undergoing SOT:

- Laboratory values should be interpreted with an accurate understanding of the patient's hormonal profile rather than gender or sex assigned at birth, particularly when those lab values are known to be impacted by hormones or body composition.
- Transplant teams should discuss the potential interactions between GAHT and transplant medications, the indications and possible time course for holding GAHT, available alternatives for avoiding gender dysphoric changes if GAHT is held, how GAHT may impact the long-term function of the graft, and how transplant medications may impact body image.
- Transplant teams should invite open communication early in the transplant process (preferably pre-transplant) regarding desired gender-affirming surgery and potential complications.

While these principles can begin to help provide the groundwork for equitable care for transgender patients undergoing SOT, more investigation into all aspects of transgender transplant care is necessary for complete and quality care for these individuals.

10 | UNOS

UNOS and the Organ Procurement and Transplantation Network (OPTN) are in the process of updating gender data labels from gender based on sex at birth which did not account for nonbinary individuals, particularly those who have had gender-affirming surgery. Sex Parameter for Clinical Use (SPCU) is a sex category with a value based on specified observations that communicates the category that would best align with expected observations and will be included in future data collection [100].

11 | Summary/Conclusions/Recommendations

While future research on gender diverse pediatric transplant patients will be critical to improving this care, this review highlights what is known about key areas of consideration when discussing transplantation in this population. All pediatrics providers can expect to care for gender diverse patients and should work to create affirming clinical environments. Gender-affirming care is crucial for the overall wellness of gender diverse patients and may even be lifesaving. The complexity of the impact of GAC on many facets of transplant health and the lack of guidelines in this area underscore the importance of an individualized approach to each gender diverse transplant candidate.

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Data Availability Statement

The authors have nothing to report.

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