

# Shades of Blue, Pink & White:

Perioperative Considerations in Transgender Persons

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### INTRODUCTION

Even though they exist in many cultures worldwide and throughout history, transgender people continue to face devaluation of social status and stigma and are considered abnormal in many cultures(1). Even in societies with progressive human rights policies, they continue to be marginalised and discriminated against(2). In recent decades, advocacy for transgender individuals has become prominent in the western world(1). It is estimated that there are 25 million transgender individuals worldwide and 1 million in the USA alone(3, 4). There is no data available on the number of transgender people living in South Africa. Increasing visibility and acceptance makes it more likely that transgender patients will be encountered in the perioperative setting(4).

A transgender person is an individual whose gender identity and expression differs from the gender or sex, and expectations thereof, they were assigned at birth(3-6). Sex and gender are two distinct entities, and this understanding is paramount to understanding what it means to be transgender; sex refers to the physical characteristics (anatomical and genetic) used to define one as male, female, or intersex, whereas gender is a person's internal experience of being masculine, feminine or other, and is often rooted in cultural expectations(4, 5). Another important distinction is that between transgender and intersex persons (also referred to as disorders of sexual development), the latter refers to various conditions in which a person's sexual anatomy and or chromosomal or hormonal patterns do not fit stereotypical definitions of male or female(5). Other definitions that are important in understanding terms relating to the Lesbian, Gay, bisexual, Transgender, Queer, Intersex, Asexual (LGBTQIA) community are detailed in Table 1; this list is not exhaustive but entails terminology relevant to this discussion. The language and terminology used by this community is constantly evolving; variations in meaning and use may be observed among community members of different ages, cultural backgrounds, or sub-populations(7).

*Table 1. LGBTQIA Terminology (3-5)*

<b>Term</b>	<b>Definition</b>
Cisgender	An individual whose gender identity is congruent with the sex they were assigned at birth
Gender Identity	A person's internal sense of being male, female, or other.
Gender Dysphoria	Clinically significant distress or social/occupation impairment brought about by the incongruence between one's gender identity and assigned gender.
Transgender man (Trans man)	An individual likely assigned female sex at birth but now identifies as male.
Transgender woman (Trans woman)	An individual likely assigned male sex at birth but now identifies as female.
Transition	Time over which a person begins to live as the gender they identify as, rather than that which was assigned at birth.
Nonbinary/ Gender nonconforming/ Genderqueer	A person whose gender falls outside the binary concept of gender; a person may identify as both male and female, neither or a combination of genders
Transexual	A non-preferred term for transgender
Sexual orientation	Is about who a person is sexually attracted to, it is not necessarily related to one's gender identity.

Transgender individuals may seek health care services for reasons related to their gender incongruence and transition(3) and other general medical needs. In addition to their gender incongruence healthcare needs, transgender people are also at increased risk of substance abuse, mental illness, and suicidality(2). In countries with low HIV prevalence, transgender people have a disproportionately high incidence of HIV infection(2); it is unknown how the incidence of HIV in transgender persons in South Africa compares to the general population given the high prevalence of HIV in the general population in South Africa.

In addition to HIV, transgender persons are at a higher risk of other STIs, high sexual behaviour (multiple sexual partners, transactional sex, and unprotected sex), societal transphobia, lack of social support, and low self-esteem often leave transgender persons unable to negotiate safe sex practices, increasing the risk of STIs(2, 8). Literature on STIs in transgender persons may not be fully representative of this community as studies focus on transgender women in the commercial sex industry and heavily focus on HIV to exclude other viral and bacterial STIs(9). Jones et al. (2020) found that the prevalence of urethral and rectal STIs (Chlamydia and Gonorrhoea) was high among men who have sex with men and transgender women in South Africa; in this study majority of patients were asymptomatic(10). These findings highlight a limitation in the syndromic approach to STI management in South Africa(10), and perhaps an alternative strategy needs to be sought after for this population.

The lack of evidence-based literature and limited (if any) healthcare education often leaves healthcare providers unequipped and unfamiliar with this unique population(4, 11, 12). Anaesthesiologists may be required to care for these patients for routine, emergency, gender-related, and non-gender-related surgeries, and these patients may also be encountered in the critical care setting(11).

Gender dysphoria is clinically significant distress or social/occupation impairment brought about by the incongruence between one's gender identity and assigned gender (1). Only a portion of transgender people experiences gender dysphoria at some point in their lives. A myriad of treatment options for gender including; changing one's gender expression (living out gender identity), hormone therapy, surgical transitioning, and psychotherapy(13). The diagnostic criteria for gender dysphoria are detailed in The **Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition** (DSM-5).

## **HORMONE THERAPY**

Hormone therapy is a medical necessity for many transgender and gender-nonconforming individuals who experience gender dysphoria. Hormone therapy induces masculinising or feminising changes to allow one's physical appearance to better align with one's gender identity. Treatment is tailored to the individual goals; some may seek maximum masculinisation or feminisation, while others experience relief with an androgynous physical appearance(13).

The World Professional Association for Transgender Health's (WPATH) Standards of Care for Health of Transexual, Transgender, and Gender-Nonconforming People version 7 of 2012 requires the following criteria be met for adults to be initiated on hormone replacement therapy:

- persistent, well-documented gender dysphoria.
- Capacity to make fully informed decisions and to consent to medical treatment.
- Age of majority as for each country.
- If significant medical or mental health issues exist, they must be reasonably well controlled.

### **Female-to-Male**

Testosterone is the backbone of hormone therapy for transgender men seeking a more masculine physical appearance; treatment aims to reach testosterone levels in the normal physiological range for males(1). The onset of effects and time to maximal effect is variable and detailed in Table 2a. Testosterone can be given orally, via transdermal patches and gels, and via subcutaneous and intramuscular injections(1). Even though transgender men exhibit elevated triglyceride levels, they still have lower rates of ischaemic heart disease than their cisgender male counterparts. Other undesirable testosterone effects include acne, polycythaemia, liver dysfunction, weight gain and sleep apnoea, and adverse psychological changes(4). In the presence of other risk factors, transgender men are at increased risk of type 2 diabetes and hypertension(13). There is no evidence to suggest transgender men on testosterone are at an increased risk of gynaecological malignancies (ovarian, uterine, breast and cervical)(1, 13). Pregnancy, unstable coronary artery disease, breast cancer, and untreated polycythaemia (haematocrit >55%) are absolute contraindications to testosterone therapy(14).

### **Male-to-Female**

Where testosterone alone is good therapy for the masculinisation of transgender men, hormone therapy for transgender women is slightly more complex. In addition to oestrogen supplementation, transgender men often require antiandrogen therapy to lower endogenous testosterone levels(1). This combination therapy aims to achieve physiological female testosterone levels while avoiding supraphysiological levels of oestrogen from high dose oestrogen therapy. Oestrogen, like testosterone, is available in a variety of preparations. Ethinyloestradiol is associated with a greater risk of venous thromboembolism and is best avoided; transdermal oestrogen preparations are preferred in patients at risk of venous thromboembolism(1, 13). Spironolactone is usually the first-choice antiandrogen agent; alternatives to spironolactone include cyproterone acetate, Gonadotropin Releasing Hormone (GnRH) agonist (e.g., Goserelin, buserelin), and 5-alpha reductase inhibitors(1, 13). Physical changes begin in the first few months of therapy and can take years to reach maximal effect(1); the timeline of expected physical changes is detailed in Table2b.

All patients initiated on exogenous oestrogen should be counselled on the risk of venous thromboembolism, smoking cessation should be encouraged, and personal and familial risk factors sought out(1). In addition to the increased risk of venous thromboembolism, transgender females on hormone therapy have an increased risk of gall stones, liver impairment, hypertriglyceridemia, weight gain, hypertension, and prolactinomas. The risk of cardiovascular disease and type 2 diabetes is increased in the presence of other risk factors(5, 13).

**Table 2a:** Time course of Testosterone effects(13).

<b>Effect</b>	<b>Time to Onset</b>	<b>Time to Maximum Effect</b>
Skin oiliness/acne	1-6 months	1-2years
Facial/body hair growth	3-6 months	3-5 years
Scalp hair loss	>12 months	Variable
Increased muscle mass/strength	6-12 months	2-5 years
Body fat redistribution	3-6 months	2-5 years
Cessation of menstruation	2-6 months	N/A
Clitoral enlargement	3-6 months	1-2 years
Vaginal atrophy	3-6 months	1-2 years
Deepened voice	3-12 months	1-2 years

**Table 2b:** Time to effect of oestrogen and antiandrogens(13)

<b>Effect</b>	<b>Time to Onset</b>	<b>Time to Maximum Effect</b>
Body fat redistribution	3-6months	2-5 years
Decreased muscle mass/strength	3-6 months	1-2 years
Softening of skin/decreased oiliness	3-6 months	Unknown
Decreased libido	1-3 months	1-2 years
Decreased spontaneous erections	1-3 months	3-6 months
Male sexual dysfunction	Variable	Variable
Breast growth	3-6 months	2-3 years
Decreased testicular volume	3-6 months	2-3 years
Decreased sperm production	Variable	Variable
Thinning and slowed growth of body and facial hair	6-12 months	>3 years
Male pattern baldness (stops loss, no regrowth)	1-3 months	1-2 years

## GENDER AFFIRMING SURGERY

In the early 1930s, Lili Elbe died from complications related to a uterine transplant, and she is regarded as one of the first transgender women to undergo gender-affirming surgery; the earliest record of gender-affirming surgery in a transgender man was in the 1940s(1). In South Africa, Groote Schuur Hospital in Cape Town has offered surgical services for transgender persons since the 1970s(15). With more than five decades of clinical experience, expert professional consensus and best practice recommendations, gender-affirming procedures are no longer considered experimental, cosmetic and lifestyle surgeries; they are reconstructive and a medical necessity(15).

Surgery is most often the final and most considered step in treating gender dysphoria; while not all patients who experience gender dysphoria require surgery, it is - for many - a medical necessity to alleviate their gender dysphoria(13). There is a wide variety of surgical treatment options available for gender dysphoria (see Table 3), broadly classified into three categories:

1. Top or chest surgery – Refers to surgery for breasts and chest wall.
2. Bottom Surgery – Refers to genital surgery.
3. Other – Gender affirming surgery that is neither top nor bottom (e.g., vocal surgery, liposuction, body contouring)(1).

The combination and extent of surgery are varied and dependant on an individual's transition goals, one need not go for both top and bottom surgery, and there is no specific order in which the surgeries need to occur (1).

**Table 3.** Surgical procedures for the treatment of Gender Dysphoria (1, 13).

<b>Female to Male</b>		<b>Male to Female</b>		
<b>Top Surgery</b>	<b>Bottom Surgery</b>	<b>Top Surgery</b>	<b>Bottom Surgery</b>	<b>Other</b>
Mastectomy	Hysterectomy	Augmentation	Penectomy	Facial surgery
Creation of male chest	Oophorectomy	mammoplasty (implants, lipofilling)	Orchiectomy	Thyroid-chondroplasty
	Metoidioplasty		Vaginoplasty	Voice modification surgery
	Vaginectomy		Vulvoplasty	Liposuction/body contouring
	Phalloplasty		Clitoroplasty	Body implants (e.g., pectoral, gluteal)
	Scrotoplasty		Labioplasty	
	Erection and/or testicular prosthesis			

The WPATH Standards of Care for Health of Transexual, Transgender, and Gender-Nonconforming People version 7 of 2012 details criteria for surgery eligibility (see Table 4); the criteria are based on best available evidence expert clinical consensus(13). Importantly surgical candidates need to have persistent, well-documented gender dysphoria, legal age and capacity to give informed consent and have well-controlled comorbidities; hormone therapy is not a prerequisite for all surgical interventions (1, 13). Referral from one mental-healthcare provider is recommended for top surgery, two referrals are required for bottom surgery, and some procedures (e.g., facial surgery, voice modification, body contouring) do not require a referral from a mental healthcare provider(1). The criteria given by the WPATH applies to surgery for the management of gender dysphoria; these criteria need not be met for the same surgeries in patients with other medical indications. The criteria for 12 months of continuous hormone therapy before gonadectomy is to introduce a period of reversible hormone suppression (oestrogen or testosterone) before irreversible surgery. Similarly, the criteria requiring an individual to live out the gender role congruent to their gender identity for 12 continuous months before certain genital surgeries allow them to experience and socially adjust in their gender role before irreversible surgery(13).

**Table 4.** WPATH Standards of Care for Health of Transsexual, Transgender, and Gender-Nonconforming People version 7 of 2012 Criteria for Surgery(13)

One Referral (Top Surgery)	Two Referrals (Bottom Surgery)	
<u>Female-to-male:</u> mastectomy, creation of a male chest <u>Male-to-female:</u> augmentation mammoplasty	<u>Female-to-male:</u> hysterectomy, Oophorectomy <u>Male-to-female:</u> orchiectomy	<u>Female-to-male:</u> Metoidioplasty, phalloplasty <u>Male-to-female:</u> vaginoplasty
<ol style="list-style-type: none"> <li>1. Persistent, well documented gender dysphoria.</li> <li>2. Capacity to make a fully informed decision and to consent for treatment.</li> <li>3. Age of majority in each country.</li> <li>4. If significant medical or mental health concerns are present, they must be reasonably well controlled.</li> </ol>	<ol style="list-style-type: none"> <li>1. Persistent, well documented gender dysphoria.</li> <li>2. Capacity to make a fully informed decision and to consent for treatment.</li> <li>3. Age of majority in each country.</li> <li>4. If significant medical or mental health concerns are present, they must be reasonably well controlled.</li> <li>5. 12 continuous months of hormone therapy as appropriate to the patient's gender goals (unless the patient has a medical contraindication or is otherwise unable or unwilling to take hormones).</li> </ol>	<ol style="list-style-type: none"> <li>1. Persistent, well documented gender dysphoria.</li> <li>2. Capacity to make a fully informed decision and to consent for treatment.</li> <li>3. Age of majority in each country.</li> <li>4. If significant medical or mental health concerns are present, they must be reasonably well controlled.</li> <li>5. 12 continuous months of hormone therapy as appropriate to the patient's gender goals (unless the patient has a medical contraindication or is otherwise unable or unwilling to take hormones).</li> <li>6. 12 continuous months of living in a gender role that is congruent with their gender identity.</li> </ol>

## PERIOPERATIVE CONSIDERATIONS

An increasing number of people seeking gender realignment surgery, coupled with increased acceptance and visibility of transgender individuals, increases the likelihood of anaesthetists caring for transgender patients in their clinical practice(4, 12). Lack of education and paucity of evidence on the perioperative issues and management of the transgender patient adds to the challenges anaesthetists face in providing care to this unique population group(4, 12). There are no guidelines on the perioperative management of transgender individuals; even the WPATH's comprehensive Standards of Care for Health of Transexual, Transgender, and Gender-Nonconforming People does not give guidance on perioperative issues and management thereof in this population group.

### Preoperative Evaluation

The preoperative assessment aims to reduce the risks associated with surgery and anaesthesia, increase the quality of perioperative care, and obtain informed consent for the anaesthetic procedure(16).

In an ideal situation, information regarding the patient's preferred name, gender identity and preferred pronouns (see Table 5) would be available to the anaesthetist before meeting the patient; in many instances, this may not be possible, and as such, it is best to ask the patient to self-identify(7). A person's legal name (the name assigned at birth) and preferred name may be incongruent; in these instances, it is necessary to document the legal identity as this may have implications for legal records and insurance claims(4). Nonetheless, it is critical to address the individual using their preferred name and pronouns; not only does this build rapport in the physician-patient relationship, but it has also been shown to affirm gender identity and reduce mental health risks (depression and suicidality) known to be high in this group(7, 17). Using the preferred name and pronoun should continue intraoperatively even if the patient is under general anaesthesia(7). It is also essential to clarify with the patient if using their preferred name and pronouns in the presence of other people is okay to avoid accidental disclosure (outing) of ones' transgender status(7, 11). Roque (2019) recommends using the patient's name instead of pronouns where healthcare providers find it difficult to reliably and consistently use the patient's preferred pronouns. Patients should be allocated rooms in keeping with their gender identity; private rooms, if available, may help alleviate some anxiety surrounding the hospital admission and limit the risk of being outed(4, 7, 12). A chaperone should always be present for physical examination; the sex of the chaperone should be decided by the patient(4, 12).

**Table 5.** Examples of pronouns(4)

<b>Identification</b>	<b>Pronoun</b>
Cisgender-male	He/him/himself
Cisgender-female	She/her/herself
Transgender male: female to male	He/him/himself
Transgender female: male to female	She/her/herself
Nonbinary: gender nonconforming	They/them/themself
Gender neutral	Zhe/zhim/zher/zhers/zhimself

In patients that have had facial surgery and vocal feminisation surgery, the conventional airway exam may prove to be misleading, as the resultant airway changes may not be apparent(12). Chin augmentation with fillers can lead to a longer perceived thyromental distance, whereas mandible reduction can lead to an overcrowded oropharynx; other surgery that changes the shape of the face can also impact airway management(12). Vocal feminisation surgery aims to achieve a more feminine voice through shortening and mass reduction of the vocal cords; many procedures can be used to achieve this goal. The general result is that there is narrowed and

scarred glottic aperture, making tracheal intubation difficult, and a smaller endotracheal tube should be considered(12). Transgender patients may have airway anatomy in keeping with their sex before transition, and the anaesthesiologist should also bear this in mind when selecting airway equipment (e.g., size of face mask, endotracheal tubes and supraglottic airway devices)(12). Transgender men may have procedures to increase the size of the thyroid cartilage to give a more masculine appearance; this is typically done using a graft from rib cartilage, which can lead to scarring and difficulty in tracheal intubation(18). A case report by Vowles, Ahmad and Chritodoulides (2020) details a case of an unanticipated difficult airway in a transgender female who had undergone vocal and facial feminisation surgery, and this was not disclosed at the preoperative assessment(18). This case emphasises the need for a focused and thorough history and airway assessment in transgender patients.

Transgender patients are also at high risk of concurrent psychiatric illness, and thorough history should be taken, including any medications the patient is on for their psychiatric illnesses(12). Figure 1 provides recommended management of psychiatric medications in the perioperative period. A sedative premedication should be considered for transgender patients, given the high risk of anxiety and stress associated with being in a hospital environment(4, 7).

**Figure 1. Perioperative management of Psychoactive drugs(19).**

Drug group	Examples of drug	Perioperative concerns	Withdrawal symptoms	Preoperative discontinuation recommendations
TCA's	Amitriptyline, imipramine, dosulepin	Muscarinic, histaminergic, and $\alpha$ -adrenergic blocking effect	Yes	Discontinue
SSRIs	Venlafaxine, fluoxetine	Anti-cholinergic effect	Yes	Can continue
MAOIs	Phenelzine, moclobemide	Avoid serotonin crisis precipitants Avoid indirect-acting sympathomimetics	Yes	Irreversible MAOI—discontinue 2 weeks before surgery Reversible MAOI—discontinue on day of surgery
Mood stabilizers	Lithium	Avoid serotonin crisis precipitants Prolongation of NMB drugs Reduction in anaesthetic agent requirements Avoid NSAIDs	No	Discontinue 24 h before surgery
Typical antipsychotics	Carbamazepine	Inducer of cytochrome P450 system	No	Can continue
	Valproate	Interferes with platelet function	No	Can continue
	Prochlorperazine, chlorpromazine	Cholinergic, $\alpha_1$ -adrenergic, and histaminergic blocking effect Caution desflurane	Yes	Can continue
Atypical antipsychotics	Quetiapine, risperidone	$\alpha_1$ -adrenergic blocking effect	Yes	Can continue
BDZs	Lorazepam, temazepam	Sedative	Yes	Can continue

Adopted from Peck, T., Wong, A., & Norman, E. (2010). Anaesthetic implications of psychoactive drugs, Table 1. Continuing Education in Anaesthesia, Critical Care & Pain, 10, 177-181.

Preoperative blood investigations are determined by the patient's underlying medical conditions and standard assessment protocols (11). Interpretation of laboratory data in patients on hormone therapy may be difficult as normal range values change with the course of hormonal therapy, and there are no established normal values for transgender persons. It is generally accepted that after six months of continuous hormone therapy, transgender patients will have the same normal values as their cisgender counterparts(4, 11).

Pregnancy testing is recommended for transgender men who have female internal reproductive organs and are having unprotected sex; although the risk of pregnancy is lower if testosterone is used, there are reports of patients falling pregnant while on this hormone(4, 7).

There is no consensus on the discontinuation of hormonal therapy perioperatively. Due to the risk of venous thromboembolism, some surgeons instruct their patients to stop oestrogen therapy 2 to 4 weeks before surgery even though there is no substantial evidence to back this practice(4, 7, 11). Common oestrogen withdrawal symptoms include hot flushes and mood swings and reversal of feminising effects if stopped for a prolonged period. A discussion involving the

surgeon, patient and endocrinologist should be had on the decision and timing of hormone withdrawal and re-initiation(4, 11).

Some patients may use chest binders in order to have the appearance of a flatter chest(7). It is advisable to request patients to remove these preoperatively as they may affect respiratory mechanics in the ventilated patient, resulting in a restrictive type of respiratory compromise(7, 11). Binders are also associated with back, chest, and shoulder pain; although evidence is lacking, it is reasonable to think that these patients would be at a greater risk of chronic pain(7).

Many risk stratification models and scoring systems use sex as one of the indices in risk assessment; it is unclear how the risk profile changes when an individual has taken hormonal treatment or undergone surgery(12). Given the lack of evidence, Lennie, Leareng, and Evered (2020) recommend risk stratification using the sex that confers the highest risk.

## **Intraoperative Management**

The intraoperative anaesthetic management is guided by the preoperative assessment and any issues identified. The perioperative staff should be made aware of the sensitive nature of the patient's identity; the patient's preferred name and pronouns should be made known to and used by all the staff involved in the patient's perioperative care(11). Transgender patients tend to incite undue curiosity from perioperative staff who are not familiar with this population group. Therefore, it is essential to minimise traffic and staff rotation in theatre; unnecessary discussions around the patient's transgender status should also be discouraged(4, 11).

The administration of anaesthesia should follow institutional protocols and standards(4, 11). Some consideration needs to be given to potentially problematic urinary catheterisation in patients they have had previous urogenital surgery involving the urethra, such as; vaginoplasty, phalloplasty, metoidioplasty with urethral lengthening(11).

There are no known clinically significant drug interactions between anaesthetic agents and agents used in hormone therapy(11). However, neuromuscular monitoring may be warranted when succinylcholine is used on patients on oestrogen, as oestrogen has been shown to reduce pseudocholinesterase activity in cisgender females(12). Sugammadex is known to reduce oestrogen levels; the significance of this effect is still unknown (12). Cisgender female patients are known to have a higher risk of postoperative nausea and vomiting (PONV), the mechanism of which is unknown but is thought to involve oestrogen; it is unclear if this can be extrapolated to transgender females, however, given the fact that nausea is a known side effect of oestrogen it may be prudent to provide PONV prophylaxis to the transgender female(12). Venous thromboembolism prophylaxis in the form of calf compression devices and subcutaneous heparin should be considered in transgender females, particularly in those in their first year of hormone therapy or in those who smoke(4, 11, 12).

Drug dosing can also be challenging in the transgender patient, particularly when TCI models require sex (e.g., Schneider model for propofol and the Minto Model for remifentanyl) to calculate lean body mass determine drug dosing and delivery. In these instances, depth of anaesthesia monitors may be of help. Equations for calculating ideal body mass also differ for different sexes, and the anaesthesiologist should bear this in mind when calculating drug doses(12).

## **Postoperative Management**

The postoperative period can also be challenging for the transgender patient, especially following gender-affirming surgery; patients often experience fear, anxiety, depression and even regret despite the elective and carefully considered nature of gender-affirming surgery(4, 11). The post anaesthesia unit is a busy, high traffic area with limited privacy; care should be taken to avoid discussions that may be overheard by neighbouring patients and staff not involved in the patient's care (this principle should be applied to all patients)(4). A detailed handover report between healthcare workers should include the patients gender identity and preferred pronouns as the patient may not be able to fully represent themselves due to residual effects of anaesthesia; this also prevents repetitive questioning of the patient(4, 11). There is no literature on optimal analgesia regimens in transgender patients and any potential drug interactions with analgesic agents(11); as such, the nature of the surgery and institutional protocols should guide the management of pain in the perioperative period.

There is no evidence to suggest that transgender men are at a higher risk of cardiovascular disease as a result of testosterone supplementation(4). Antwi-Amoabeng et al. (2020) conducted a retrospective study of 16 555 transgender patients to determine the prevalence of arrhythmias in this population following gender-affirming surgery; the authors found no difference in the prevalence of arrhythmias between the transgender and general population(20). However, this study found that transgender men had a higher prevalence of arrhythmia than transgender females(20); the underlying cause for this is not clear. Testosterone supplementation could be a possible cause, but there is insufficient evidence to make this conclusion.

## **Paediatric and Adolescent Concerns**

Standards dictate that gender-affirming surgery be only offered to adults and occasionally older adolescents; the paediatric anaesthetist may encounter the transgender patient should they present for routine (non-gender affirming) or emergency surgery(7). Many of the perioperative considerations applicable to adults are also applicable to this younger population group.

Treatment options for gender dysphoria in transgender adolescents are divided into three main categories: Full reversible interventions (this involves puberty-blocking agents such as GnRH analogues to delay the physical changes associated with puberty), partially reversible changes (this includes masculinising or feminising hormone therapy, some of the changes require surgery to reverse, such as gynaecomastia induced by oestrogen), and Irreversible interventions (these are surgical interventions)(13). Table 6. outlines possible age-related transition treatments.

Hormone therapy in young patients is mainly aimed at blocking puberty; some gender affirming hormones may also be used in older adolescents, there are no known clinically significant drug interactions between anaesthetic and puberty blocking agents(7). Anatomical airway considerations of adults do not apply to children and adolescents as current standards do not allow for surgery in this age group.

**Table 6. Age related Transition options(7)**

Age	Treatment Options
Puberty	Social transition
Adolescents (> Tanner stage 2)	Social Transition
	Puberty Suppression (GnRH analogues)
Adolescent with capacity to give consent	Social Transition
(usually >16 years old)	Puberty Suppression
	Gender affirming hormone therapy
	Breast reduction surgery
Adults	Social Transition
	Gender affirming hormone therapy
	Top Surgery
	Bottom Surgery

## THE SOUTH AFRICAN PERSPECTIVE

South Africa is the only African country that assures equal rights for transgender people and offers constitutional protection against discrimination based on sex, gender, and sexual orientation(6, 21). Even though the South African constitution proclaims access to health care for all, this has not translated to health care policies and guidelines that support LGBTQIA people(6, 22). The Alteration of Sex Description and Sex Status Act 49 of 2003, makes allowance for individuals who have transitioned from one gender to another to change their gender marker, legally allowing them to live out their gender identity (21, 22). The act does not require the individual to have had gender reassignment surgery; hormone therapy alone is sufficient. However, home affairs officials have been known to misapply this act by turning away applicants who have not had surgery(21).

Only two public hospitals (Groote Schuur Hospital and Steve Biko Academic Hospital) offer comprehensive transgender health services in South Africa, including surgical services. These facilities can only complete 2 to 4 gender reassignment operations annually; this limited availability of surgical services has translated into waiting lists of 15 to 20 years for transgender surgeries in the public sector (15, 21). Theoretically, it may be possible to provide hormone replacement therapy widely across the country in a primary healthcare setting; however, no such policies exist. There is better access to these services for patients who can afford private health care, even though there are limited healthcare providers available. Medical aids generally do not provide cover for surgical services as they are considered cosmetic (21).

A qualitative study done in Kwa-Zulu Natal by Luvuno et al. (2019) found that due to lack of healthcare services and stigma, transgender individuals would resort to hormone therapy without health care provider supervision, and self-mutilation (to remove or conceal genitalia) was also reported. These findings were consistent with trends seen in other studies that detail self-mutilation and the use of illicitly sourced cross-gender hormones because of lack of access to health care(2).

Health care workers' discriminatory and insensitive treatment (Nurses, doctors, lay counsellors, and social workers), health care worker ignorance and health system micro-aggression are some of the challenges experienced by transgender individuals seeking health care services in South Africa (2).

Luvuno et al. (2019) suggest that exclusion of training on sexual and gender minorities in the training curricula of most healthcare workers is a possible reason for the poor treatment of transgender patients by healthcare workers. Initiatives to include transgender health in the pre-service training curriculum for health care workers, coupled with in-service training and sensitisation, require urgent attention(2); whilst this only addresses one aspect in the plethora of issues faced by transgender people in navigating the health care system in South Africa, it has the potential to make an immediate impact on how transgender people are received when seeking healthcare services.

## **CONCLUSION**

The transgender community has many unique health care needs that require a multidisciplinary approach(11). Appropriate training for staff involved in the management of transgender patients is necessary; registrar training programmes can provide an opportunity for some of these knowledge gaps to be addressed(4). The lack of evidence in the perioperative management of issues relating to transgender patients provides an additional challenge to the anaesthesiologist(11); this challenge does present an opportunity for research.

Careful consideration of the anatomical, physiological, pharmacological, social and psychological aspects of anaesthetic care is particularly important in providing safe care to these patients(12).

Whilst the South African constitution is exceptional as far as human rights are concerned, implementation of these rights has been found wanting(6); this has led to a healthcare system that is ill-equipped to cater for the needs of the growing transgender population.

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