Multidisciplinary Clinical Research Journal
ISSN 3064-8149
Volume 11 Issue 2
April –June 2023
Impact Factor: 6.88
Enquiry: contact@continentalpub.online
Published by Continental Publication |
https://continentalpub.online/index.php/Clinical

INCLUSIVE CONTRACEPTION: NAVIGATING GENDER-AFFIRMING CARE

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Abstract: *Transgender and gender nonconforming (TGNC) individuals, estimated to surpass 1.6 million in the United States alone, encounter significant disparities in accessing comprehensive healthcare, including reproductive services. Certified Nurse Midwives (CNMs), pivotal in primary reproductive health care delivery, are uniquely positioned to address these disparities, particularly in underserved settings such as Federally Qualified Health Centers and rural areas. However, TGNC individuals face multifaceted barriers to general and reproductive healthcare, stemming from structural, interpersonal, and individual-level factors. These barriers include elevated rates of sexually transmitted infections (STIs), reluctance to seek sexual and reproductive health services, and encounters with uninformed or unwelcoming providers. Furthermore, accessing care necessitates disclosing intimate details and potentially outing oneself, adding layers of complexity to an already challenging process. This review explores the unique healthcare needs of TGNC individuals, emphasizing the crucial role CNMs can play in mitigating disparities and fostering inclusive and affirming reproductive healthcare environments.*

Keywords: Transgender healthcare, Gender nonconforming individuals, Certified Nurse Midwives, Reproductive healthcare disparities, Inclusive healthcare environments

INTRODUCTION

There are estimated to be more than 1.6 million transgender and gender nonconforming individuals ages 13 and up in the United States (Meerwijk and Sevelius, 2017). Certified Nurse Midwives play a crucial role in primary reproductive health care in many settings, particularly underserved settings such as Federally Qualified Health Centers and rural areas, in line with the American College of Nurse Midwifery (ACNM)‟s Hallmarks of Midwifery (Butler et al., 2020). Trans and gender expansive individuals are underserved for general healthcare due to numerous structural, interpersonal, and individual-level barriers to care (Hay et al., 2019). Specific to reproductive healthcare, trans and gender expansive people face barriers including disproportionate rates of STIs, reluctance to seek sexual and reproductive health care, a lack of knowledgeable and welcoming providers (Burgwal et al., 2019), and the same access issues that impact broader barriers to healthcare with the added strain of necessarily discussing intimate details and outing oneself not just to providers but to all employees of a healthcare system who have a need to access the patient's records.

Specific to midwifery as a discipline, despite the presence of midwives who are competent and passionate to provide care to trans and gender expansive people as well as public advocacy by the ACNM in support of the transgender and queer community (American College of Nurse-Midwives, 2019), the foundational philosophy of care of the ACNM pointedly mentions “woman” and “women” in each line of its Philosophy of Care and makes no specific reference to trans and queer people (Butler et al., 2020). There is also a public and professional perception that midwifery, like OB/GYN, is an inherently gendered discipline exclusionary of people outside the gender binary category of cisgender. However, in the past several years, there has been magnificent work done to improve perception and understanding of trans and gender-expansive persons specifically in the midwifery literature. As authors, we are delighted to share our experience and aid in the understanding of contraceptive options for trans and gender-expansive persons.

In this article, a framework to aid clinicians in navigating contraception decisions focusing on transmasculine, transfeminine, and nonbinary individuals is introduced. Nurse-midwives are appropriately suited to provide contraceptive guidance for all individuals. Specifically, the authors present three sections divided by population of interest. In each section, the authors discuss current contraceptive options with population-specific considerations. The authors present an adapted algorithm to aid the nurse midwife or other clinician in navigating the growing complexity and diversity of populations served. The article concludes with a brief overview of contraceptive options currently in development. Before beginning a potentially polarizing and dividing discussion, several important points must be addressed for those that seek to provide care for trans and gender-expansive individuals. In order to provide adequate counseling to trans and gender-expansive individuals, clinicians must create a safe environment where they provide care (Kuzma et al., 2019). See Table I for a complete set of recommendations. Even the perception of an office or other care environment that may not be friendly towards trans or gender-expansive persons is a barrier to care. Many trans and gender-expansive individuals preemptively anticipate that they may be treated in an unprofessional or hostile manner by the clinician and/or the health care team (Foy et al., 2019). Additionally, it is important to consider the waiting room environment at a provider's office. Trans or gender-expansive persons may feel uncomfortable and unsafe in a waiting area populated only with cisgender women or pregnant women (Francis et al., 2018). A reasonable approach may be to provide times outside of typical office hours or reserve time when there is a limited number of persons in the waiting area (Francis et al., 2018). Trans and gender-expansive persons should be addressed by all clinical staff and clinicians by their preferred name. It is possible the name listed on the insurance card or medical record, or even driver’s license is not the preferred name. If unsure of how the individual prefers to be addressed, do not assume. Additionally, using the correct pronoun is essential. Many individuals prefer they/them to he/him or she/her. All office staff should undergo training on using the patient’s preferred name and pronoun. Referring to a patient by the incorrect name and/or pronoun may cause discomfort and can inhibit the patient from further open discussion (T‟Sjoen et al., 2020). If a language or pronoun mistake occurs, apologize, clarify, and move on (Rosen-Carole and Greenberg, 2022). The most important aspect of medical care that trans and gender-expansive individuals care about is that they feel their identity is supported without providers trying to change or “fix” them (Kearns et al., 2021).

Despite the fact that many countries have made significant advances in LGBTQ+ rights in recent years, discrimination and disparities persist and make it more difficult for trans and gender-expansive individuals to identify and discuss their sexual and contraceptive needs in a safe environment (Francis et al., 2018). For clinicians who may have little or no experience providing gender-affirming care, including assessing contraceptive needs, there are many resources available (Lapinski et al., 2018; Haseen et al., 2020; Hashemi et al., 2018). Competent, compassionate care, such as taking a comprehensive history, including a history of sexual violence that has/is directed at the individual, comprehensively providing contraceptive education, and managing contraceptive needs in a sensitive, respectful way, should be available to all individuals (Rubin et al., 2018).

Avoid making assumptions about trans and gender expansive persons. Within the trans and gender expansive community, there is great diversity in the way individuals view their own gender identity and how they outwardly express their gender. Clinicians may, at times, make assumptions about the sexual orientation of their patients. Trans or gender-expansive individuals may identify as heterosexual, homosexual, bisexual, or none of the above. Additionally, not all individuals who identify as trans or gender-expansive want to have gender-affirming surgery or hormone therapy. A welcoming clinical environment with compassionate, knowledgeable, and respectful clinicians is key to helping reduce many of the health disparities that exist within the trans and gender-expansive community. The Center of Excellence for Transgender Health has resources for training, education, and capacity building for clinicians looking to improve their knowledge and comprehension when caring for transgender persons (UCSF, 2023).

Table 1. Important points when providing contraceptive guidance with trans and gender-expansive persons.

S/N	Points
1.	Create a physically safe/ welcoming clinic environment
2.	Use appropriate language
3.	Obtain a detailed sexual history
4.	Avoid assumptions
5.	Be vigilant in staying up to date on the latest trans and gender-expansive practice guidelines and competency

Source: Author.

METHODS

The literature review was conducted using CINAHL, PUBMED, and GOOGLE SCHOLAR. The following key words were used as search terms in the databased listed: Transgender health, contraception, Female to male transgender, Male to female transgender, clinical guidelines, birth control. Abstracts of the search results were reviewed and if deemed relevant, the article was read in its entirety. Reference lists were used to also find articles that may have not resulted using key terms. Approximately 350 abstracts were reviewed for this manuscript.

DISCUSSION Contraceptive considerations for trans masculine individuals

For transgender men (also referred to as transmasculine individuals), there is a paucity of data examining pregnancy risk and contraceptive guidelines, creating an added level of complexity and difficulty in appropriately delivering care.[8] It is estimated about 60% of transgender men report that they are using contraception at a rate comparable to the national average of 62% (Mancini et al., 2021). Despite a large general uptake of contraception, transgender men have unintended pregnancy rates comparable to the general United States population, with some reporting pregnancies while using testosterone therapy
(Schneider et al., 2017).

Based on available evidence, all contraceptive forms are considered safe for transgender individuals regardless of whether they are taking testosterone therapy (ACOG Committee Opinion, 2021). To date, there is no available evidence that testosterone therapy in conjunction with estrogen-containing contraceptives increases the risk of thromboembolism (Krempasky et al., 2020). Additionally, the same medical eligibility criteria apply to transgender males as it does to cisgender females (Tepper et al., 2016). The medical eligibility criteria of the specific methods can be found elsewhere (Tepper et al., 2016). Additionally, comprehensive contraceptive information can also be found in several commonly used resources amongst health care providers (Tepper et al., 2016; Festin, 2020; Phillips, 2019). Despite the lack of quality data on contraceptive methods among transmasculine individuals, there are several contraceptive options that may be counterproductive or overly burdensome, depending on the wants, needs, and goals of the patient. The following is a brief overview of several methods with additional recommendations specific to transmasculine patients.

Non- hormonal LARC

The copper IUD is a non-hormonal long-acting reversible contraceptive method (LARC) with high effectiveness (99.2%) in the prevention of pregnancy (Simon, 2021). The device is a T-shaped plastic frame that is inserted into the uterus (Phillips, 2019). The recommended duration of use is ten years (Paradise et al., 2022). A potential distressing side effect specifically for transmasculine patients who do not desire menstruation is an increase in blood loss during menstruation and cramping/menstrual pain (Chrisler et al., 2016). Menstrual blood loss may increase by approximately 50%. IUD placement requires a pelvic exam and may be uncomfortable and stressful for transgender patients (Table 2) (Peitzmeier and Potter, 2017). A careful assessment of how the patient feels about menstruation can help guide the recommendation of a copper IUD (Chrisler et al., 2016). If menstruation causes distress or significant discomfort to the individual, then the copper IUD may not be the best option available for the patient.

Hormonal methods - progestins

The progestin-containing IUD is another LARC method that can be used safely in transmasculine individuals. The device is a T-shaped plastic frame that is inserted into the uterus, where it releases progestin. The duration of use can vary from three to seven years (Friedman and Oluronbi, 2019). All IUDs tend to decrease menstruation and are most likely to lead to long-term amenorrhea (Festin, 2020). As with the nonhormonal IUD, IUD placement requires a pelvic exam and may be uncomfortable and stressful for transgender patients. The progestin-containing IUD may be an option for individuals who do not wish to menstruate. An increase in cramping is noted immediately after

insertion but tends to decrease over time (Krempasky et al., 2020). **Table 2.** Important points for transmasculine pelvic exams/ iud placement.

S/N	Points
1.	Provide anticipatory guidance regarding the procedure
2.	Offer anxiolytic
3.	Ensure there are a variety of speculum sizes available
4.	Consider short-term vaginal estradiol

Source: Author.

Progesterone injection

The medroxyprogesterone acetate (DMPA) injection is an additional consideration for transmasculine persons interested in contraception. The injection consists of a 150mg intramuscular injection every three months. The mechanism of action is like other progestin-based contraceptives. DMPA is highly effective and well tolerated. There are several considerations for providers regarding DMPA and transmasculine individuals. Bleeding pattern changes may occur in up to 40% of users (Phillips, 2019). DMPA is associated with a delay of up to 1 year in the return to fertility after discontinuing use (Phillips, 2019). Progesterone's, in general, are not strongly associated with an increase in breast/chest tenderness (Shim et al., 2020). Of all the methods, the progesterone injection tends to have the highest reported rates (3-10%) of breast/ chest tenderness (Haider and Darney, 2007). This side effect can be bothersome to transmasculine individuals who are experiencing discomfort or distress with their chest/breasts at baseline.

Subdermal contraceptive implant

The subdermal contraceptive implant is a small etonogestrel-containing rod inserted in the medial aspect of the arm. The mechanism is like other progestin-containing contraceptives. The subdermal implant is highly effective. The implant has been shown to be as effective or, in some cases, more effective than sterilization (Schwarz et al., 2017; Trussell et al., 2018).

Less than 1% of cis-gender women in the first year of use will become pregnant. The IUD, DMPA injections and subdermal forms are contraceptive options that can be concealed easily by the user. However, they all require a health care provider or nurse to be directly involved in initiating or maintaining the contraceptive method, which may present additional barriers to transmasculine persons. Additionally, the methods do not protect against sexually transmitted infections, including HIV.

Progestin containing oral contraceptive pills

The progestin-only contraceptive pill is a once-a-day oral pill. It has a mechanism of action like other progestin-containing contraceptives. The progestin-only pill ranges from 93-99% effectiveness in preventing pregnancy. One consideration for transmasculine individuals is breakthrough bleeding that may occur. The breakthrough bleeding typically is more frequent during the first 1-2 months of use and is associated more with endometrial changes than with fluctuating endogenous hormones (Archer et

al., 2022). A potential option to reduce unwanted bleeding is to add estrogen after prolonged progestin-only contraceptive use. The addition of estrogen is thought to promote epithelial repair and reduce unscheduled bleeding (Cooper et al., 2022).

BARRIER METHODS

In general, barrier methods are not considered effective contraceptive methods when compared to IUDs and hormonal methods.

Condoms

There are two types of condoms, the internal condom and the external condom. The use of a condom depends on the anatomy and types of sexual activity involved. The internal condom helps keep sperm and other fluids from getting into the body. The user can insert the condom for up to 8 h before sexual intercourse. The typical use failure rate is 21% (CCP, 2018). Slightly more effective, the external condom Int. J. Nurs. Midwifery

prevents sperm and other body fluids from getting into a partner's body. Latex condoms, the most common type, help prevent pregnancy, HIV, and other STDs, with a typical use failure rate of 13-18% (CCP, 2018). It is important to stress that Latex condoms cannot be used with oil-based lubricants as this can cause the condom to lose its structural integrity and lead to rupture and or tearing during penetrative intercourse. Condoms heavily depend on the user for effectiveness. For transmasculine individuals, there may be several barriers to use. External condom use requires negotiation and acceptance with a partner. Internal condom insertion may be uncomfortable or embarrassing to some transmasculine individuals. Condoms are barrier methods that require planning and consistent use to be effective.

Spermicides

Spermicides are chemical compounds that kill sperm on contact. There are a variety of formulations of spermicides, such as a cream, foam, jelly, tablet, suppository, or film. The main mechanism is to kill live sperm in contact with the chemical before fertilization may occur. Spermicides are typically used in combination with other barrier methods. It is recommended that the spermicide stays in the vagina for at least 6 h after sex. In terms of efficacy, 20–28 of 100 cis-women each year who use spermicides alone for birth control may become pregnant (Grimes et al., 2013).

Diaphragm and cervical cap

The diaphragm is a small, dome-shaped device made of silicone or latex that fits inside the vagina and covers the cervix. The diaphragm is typically used with a spermicide. The diaphragm must remain in place for 6 h after sex, but not more than 24 h total. The cervical cap is a small plastic dome that fits tightly over the cervix and stays in place by suction. It must also be used with spermicide. Like the diaphragm, the cap must be left in place for at least 6 h after intercourse. Approximately 12 - 25% of cis-women per year may become pregnant with the diaphragm and cervical cap methods (Trussell et al., 1993).

Estrogen containing methods

The mechanism of action for the combined hormonal contraceptives (CHCs) is ovulation suppression via estrogen and cervical mucus thickening and endometrial thinning via progestin. Options include

the vaginal ring, transdermal patch, and combined oral contraceptive pill. There are several important points to consider when counseling transmasculine patients.

CHCs have the potential to lower androgen levels produced by the ovary and increase sex hormone binding globulin. The increase in sex hormone-binding globulin can bind to testosterone, theoretically lowering serum testosterone levels. As per past studies, it appears testosterone levels are maintained when using CHCs with typical estrogen levels (Grimstad et al., 2019). Many transmasculine patients experience chest/breast discomfort when initiating CHCs. Estrogen containing contraceptives do have the potential side effect of chest/breast tenderness/ hypertrophy, especially if tissue has not been removed (Krempasky et al., 2020). Typically, chest/ breast tenderness is self-limited and resolves within 3-5 months of use (Krempasky et al., 2020). Emergency contraception is safe for transmasculine individuals to use. The following are potential options: Ulipristal acetate and levonorgestrel.

Sterilization

Tubal sterilization is a highly effective, safe, and permanent method. The tubal sterilization methods are performed in an operating room under anesthesia. Surgeons perform tubal sterilization postpartum either immediately after a cesarean section or vaginal delivery or scheduled as an outpatient procedure. The sterilization methods are irreversible. Most people who choose sterilization are satisfied with their decision. There is a small proportion of cis women who regret a tubal sterilization procedure (Siemons et al., 2022). It is essential that all persons receive appropriate counseling about the permanency of sterilization, including the risks, benefits, and alternatives (Siemons et al., 2022).

Hormonal therapies that are not birth control methods

Cyproterone acetate, finasteride, and gonadotropin releasing hormone analogs are potential hormonal therapies that may reduce the overall fertility of an individual. However, hormonal therapies should not be considered contraceptive methods. It is possible prolonged use of hormonal therapies such as testosterone may decrease fertility and, if taken for a long time, may eventually lead to infertility.

IUD Insertion recommendations

Healthcare providers can take several approaches to improve the overall experience for patients undergoing an IUD placement. It is important to provide anticipatory counseling regarding details of the procedure, expected discomforts, and potential side effects. If needed, a clinician can provide a one-time dose of an anxiolytic such as a benzodiazepine. If a provider prescribes a benzodiazepine, ensure the patient has a safe form of transportation. Ensuring there are varied sizes of speculums available and using the smallest possible without significantly increasing the difficulty of IUD placement may also reduce patient discomfort. Additionally, using short-term (2-3 weeks) vaginal estradiol before the procedure may reduce the discomfort of the procedure and improve patient satisfaction.

Contraceptive considerations for transfeminine individuals

There is limited research and availability of contraceptive options for transfeminine individuals (assigned male at birth). While gender-affirming hormone therapy may potentially affect fertility, results are mixed, and individuals should not rely solely on this for contraception. Despite this, family planning and contraception are not frequently discussed in medical visits (Schneider et al., 2017), with one study finding only 20.5% of transgender youth have discussed this important topic with their

provider (Cheng et al., 2019). Contraceptive options for transgender females include male condoms, vasectomy, and orchiectomy (Trussell, 2004). We will also discuss the effects of various gender-affirming modalities on fertility.

External condoms

Condoms remain a widely available but often underutilized form of contraception with 98% effectiveness at pregnancy prevention with consistent perfect use and 82% effectiveness with general use (Phillips et al., 2023). Condoms are also the only form of contraception that also protect against STIs and HIV. Studies have found that transgender youth utilize condoms at significantly lower rates than their nontransgender peers (Budhwani et al., 2017).

Researchers have identified many barriers to consistent condom use among transgender individuals, including structural discrimination, violence, prejudice, and lower self-esteem, as potentially contributing to less consistent condom use (Fontanari et al., 2019; Haley et al., 2019). Studies have also found that many youths receive sexual education through school programming that is often focused on cis-gender, heterosexual relationships and lack trans-inclusive framing making the information less applicable and leading them to rely more heavily on peers and romantic partners for this education (Bloom et al., 2022; Fainberg and Kashanian, 2018).

Vasectomy

Vasectomy is a highly effective form of contraception with an efficacy of 99.9% after azoospermia is noted on a semen exam following the procedure. Patients should understand that a vasectomy is a permanent form of contraception, although, with surgical advancements, reversals are possible at times. Vasectomy has no effect on future gender-affirming surgeries individuals may wish to pursue. Vasectomies do not offer protection against HIV or STIs. Due to the surgical nature, vasectomies are more invasive with the potential for surgical complications, although most patients recover quickly (Adeleye et al., 2019).

Orchiectomy

Orchiectomy, when completed as part of gender affirming surgery, is also a highly effective, permanent form of contraception. As with vasectomies, due to their surgical nature, there are potential surgical complications as well as a higher cost than other forms of contraception. Only 11% of transgender females pursue orchiectomy, so while highly effective, it is important to be familiar with other forms of effective contraception as the majority of individuals will not undergo orchiectomy (Cheng et al., 2019).

Gender-affirming hormones and fertility

Gender-affirming hormones have an unpredictable effect on fertility. Estrogen therapy has been shown to suppress gonadotropin levels through the suppression of LH and FSH, which downregulates testosterone and can affect spermatogenesis, but the effect is not uniform across all individuals and, therefore, in and of itself is not an effective form of contraception Hembree et al., 2017). The addition of androgen blockers such as spironolactone can further affect spermatogenesis, but the effect is still variable (Mehringer and Dowshen, 2019). One study found that among individuals currently receiving gender-affirming hormones (estradiol and spironolactone at usual doses in addition to finasteride or micronized progesterone in some), their sperm had decreased concentration, motility, and total motile sperm count compared to those who had never been on hormones and those who had discontinued

hormones an average of 4.4 months prior to semen collection. Of the seven individuals who continued on hormones, three were azoospermia; three produced specimens with semen appropriate for insemination, and one subject produced sample with abnormal sperm on all parameters but sperm still present.[51] another study found that 28.2% of participants receiving gender affirming treatment with estrogen and spironolactone had spermatogenesis present (Gava and Meriggiola, 2019). Furthermore, studies found that the combination of anti-androgens and estrogen can result in erectile dysfunction leading users to use the combination intermittently in order to complete penetrative intercourses, further diminishing the contraceptive effectiveness (Mancini et al., 2021). Based on this research, patients should not rely solely on gender affirming hormones as a form of contraception and should be encouraged to continue condom or other contraceptive use (Mancini et al., 2021). It is important to note these studies occurred in individuals, who had already completed sexual maturation, and there is some evidence that initiating gender-affirming therapy and blockers prior to puberty may result in irreversible infertility; however, more research is needed within this area (Fraser, 1993). The addition of GnRH antagonists, such as leuprolide which is widely available in the U.S., results in competitive binding to receptors and reduction of LH and FSH to undetectable levels, thereby decreasing testosterone levels and suppressing spermatogenesis. Unfortunately, these medications are currently only available in the form of frequent, expensive injections. Furthermore, complete suppression of testosterone can result in bone mineral density loss, gynecomastia and breast tenderness, mood swings, decreased libido and erectile dysfunction (Trussell, 2004). In terms of contraception, daily injections resulted in azoospermia in 6 of 8 men within 6-12 weeks and in all participants with increase in dose (Schulze, 1988). Furthermore, studies have shown that the addition of GnRH antagonists‟ decreases testosterone significantly more than estradiol or estradiol and spironolactone alone (Gava et al., 2016). As results vary, semen analysis should be considered in order to confirm spermatogenesis suppression before relying on GnRH antagonists as a form of contraception. Data show that severe oligospermia, defined as less than one million/mL or azoospermia, can provide as effective contraception as available female oral hormonal contraceptives (Schneider et al., 2017; Trussell, 2004). Outside of the U.S., gender affirming treatment often includes the anti-androgen cyproterone acetate (CPA) in addition to estradiol instead of spironolactone. CPA acts as an antiandrogen and progestin (Schneider et al., 2017). Studies have suggested the addition of progestin to the anti-androgen can be more effective at suppressing spermatogenesis in comparison to anti-androgen suppression alone. Studies have also demonstrated that CPA can be as effective as leuprolide with Gava et al. (2016), finding that leuprolide 3.75mg monthly injections compared to CPA 50mg daily injections with both groups additionally receiving standard estradiol therapy significantly decreased total serum testosterone levels compared to baseline with no significant difference between the two groups (Angus et al., 2021). CPA has not been approved within the U.S. due to cases of severe hepatotoxicity, often at doses higher than those used in gender-affirming treatment, as well as higher rates of meningiomas and prolactinomas
(Sinha et al., 2021).

CONTRACEPTIVE CONSIDERATIONS FOR NONBINARY INDIVIDUALS

Non-binary people are those assigned male or female at birth who feel that their gender identity is not strictly male or female. Some non-binary people might want to use hormone therapy or have surgeries,

while others may have no treatments at all. The type of contraception a non-binary patient will need/desires depends on several factors, including the sex assigned at birth, reproductive goals, and the fertility of sexual partners. All contraceptive methods are potentially available for non-binary individuals. The selection of the specific contraceptive must have the patient's wants, needs, and goals taken into consideration. The provider should assess all medical eligibility criteria according to the CDC contraceptive medical eligibility criteria. There are a few guiding principles when performing contraceptive counseling, specifically for non-binary individuals. Utilizing the transgender care guidelines for creating a safe and welcoming clinic environment is encouraged (ACOG Committee Opinion, 2021). The provider and the patient work together to build a therapeutic alliance built on trust, perception, and understanding. The specifics of establishing this relationship are not in the scope of this manuscript. However, it is worth mentioning the therapeutic alliance may take time, several visits, or even years to fully develop. Once a comfort level is established, identifying the reproductive organs present in the non-binary person is important.

The presence of reproductive organs can help guide the discussions regarding optimal contraceptive options. For example, a patient has ovaries and a uterus. An assessment should be made if the patient desires pregnancy soon. If the patient does not desire pregnancy, then the desire for future use of the uterus and ovaries should be assessed, along with the type of sex the patient has. If the non-binary individual has frontal sex with people who produce sperm, then the individual may choose a method that is in line with their goals.

FUTURE OF CONTRACEPTION

Fertile humans with testicles

To date, there are six potential contraception options that may be available in the future for those who have testicles and produce sperm.

1. The daily gel formulation, called NES/T, includes the progestin compound segesterone acetate (brand name Nestorone) in combination with testosterone (Anawalt et al., 2019). It is applied to the back and shoulders and absorbed through the skin. Progestin is thought to block natural testosterone production in the testes. Progestin may reduce sperm production to low or nonexistent levels. The addition of testosterone helps maintain a normal sex drive and other functions that are dependent on adequate blood levels of the hormone (Anawalt et al., 2019). The NES/T trials are currently in phase IIb clinical trials at the date of this publication.
2. YCT529 Retinoid acid receptor-α blocker. The chemical has been shown to produce 99% infertility in primates after oral application over four weeks with no side effects (Norcross et al., 2022). To date, clinical trials have not started.
3. Dimethandrolone undecanoate (DMAU). The once daily pill suppresses two types of male hormones – follicle-stimulating hormone (FSH) and luteinizing hormone (LH) – to simultaneously decrease the production of testosterone and sperm without causing symptoms of low-testosterone (low-T) (Thirumalai et al., 2019). An injectable form is also being developed. Both are still in the early clinical trial phases.
4. Tripterygium wilfordii. Hook F. Tripterygium wilfordii, a traditional Chinese herbal medicine for rheumatoid arthritis and skin disorders, decreases sperm output and function and inhibits fertility

in rodents and men (Hifnawy et al., 2021). Studies aiming to characterize triptolide, an active alkaloid as a potential lead for an orally effective sperm function inhibitor, reveal prominent induction of germ cell apoptosis (Handelsman and Waites, 2022).

5. Modified testosterone + progesterone (11-β-methyl19-nortestosterone dodecyl carbonate. This pill combines progestin with testosterone, enhances the onset and rate of spermatogenic suppression, and allows for more physiologic T dosages (Wu et al., 2019). The modified testosterone + progesterone product successfully passed a phase 1 clinical trial. 6. Reversible Vas-occlusive methods. There are six methods being developed to either physically occlude, locally inhibit sperm transport through chemical interaction, or a combination thereof (Sokolakis et al., 2022). All appear to require a provider to administer the device or medication.

Fertile humans with ovaries (ovary) and a uterus

There are a few additional contraception options that may be available in the future for those who have a uterus, ovaries (ovary), and ovulate. There are several ongoing and completed studies examining new patches, internal condoms, spermicidal lubricants, and vaginal ring products (Cahill and Kaur, 2020). Much of the focus is now on gender inequality (traditionally burden has been on the partner with ovaries/uterus) and on the development of contraceptive methods.

CONCLUSIONS AND RECOMMENDATIONS

All contraceptive methods should be available for Trans and gender-expansive persons. Refer to the medical eligibility criteria for current contraceptive recommendations based on factors other than gender or concurrent hormone therapy. A thorough sexual history with future fertility desires is essential and will guide contraceptive counseling. Contraceptive counseling must be individualized and take the patients wants, needs, and goals into strong consideration. An algorithm on contraceptive counseling for all persons can help guide clinicians in appropriate contraceptive counseling. New methods are being developed and may improve access to contraception for all individuals.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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