

# Evidence Brief:

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## REPRODUCTIVE OPTIONS FOR TRANS PEOPLE

This fact sheet offers information about reproductive options for trans people interested in hormone therapy or surgeries. Knowing and discussing reproductive options is a necessary component of informed consent to transition-related care, and is a significant component of the World Professional Association for Transgender Health's *Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People*.<sup>(1)</sup>

**Note about terminology:** While most health care providers assume that all people with ovaries and uteri will be women and all people with testes and sperm will be men, within the trans community this is not the case. For the purposes of this fact sheet, we will refer to people according to their reproductive characteristics as opposed to their gender (D. Spade, About purportedly gendered body parts). For example, trans men will be referred to as people with ovaries and uteri or people with internal reproductive organs and trans women will be referred to as people who can produce sperm or people with external reproductive organs. An exception will be made where research explicitly refers to trans men or trans women. Genderqueer people, who do not align themselves with binary gender categories (i.e., male or female), may not identify as trans but the issues covered in this fact sheet may be relevant to them as well.

## SIGNIFICANCE OF REPRODUCTIVE ISSUES FOR TRANS PEOPLE

Research conducted with trans men in Belgium found that 54% wished to have children, and 37.5% would have considered freezing their eggs if the procedure had been available.<sup>(2)</sup> Similar research with Western European trans women found that 40% wanted to have children, with 56% of lesbian and bisexual trans women expressing interest in using their own sperm, compared with 13% of straight trans women. Many regretted losing the opportunity to parent genetically related children, and 77% felt the option to preserve sperm should be routinely offered to all trans women.<sup>(3)</sup>

## FERTILITY PRESERVATION FOR TRANS PEOPLE WHO PRODUCE SPERM

- A trans person who has testicles and plans to have them removed must bank sperm beforehand to retain the option of having genetically related children. The World Professional Association for Transgender Health recommends that trans women be encouraged to bank sperm prior to starting hormone therapy.<sup>(1)</sup>

- Testicular volume is greatly reduced by long-term estrogen use, impacting the maturation and motility of sperm.<sup>(13, 15)</sup> It is preferable to bank sperm before using hormones, especially for lesbian, bisexual, or female-partnered trans women who may want to use sperm to inseminate current or future partners.<sup>(20)</sup> A trans woman whose partner is unable to carry a child themselves may wish to become a parent with a donor egg and a gestational surrogate.
- For trans people already using hormones, a suspension of hormone treatment is recommended for a few months so that sperm production and quality can recover prior to banking.<sup>(16)</sup> A study examining the effect of high doses of estrogen suggests that testes' function can recover if the dosage is stopped.<sup>(21)</sup> If interrupting hormone treatment is not an option, poor quality semen can still be frozen for later use, which may include assisted reproductive technologies.<sup>(16)</sup> In cases where sufficient sperm cannot be produced through ejaculation, fertility clinics can provide surgical options for sperm extraction.<sup>(18)</sup>

## **BREASTFEEDING AFTER HORMONE-INITIATED BREAST DEVELOPMENT**

- It has been anecdotally reported that hormone therapy needs to continue for 2 years to develop sufficient breast tissue to lactate (Dr. N. Barwin, personal communication).
- People whose breasts develop as a result of hormone therapy may wish to breastfeed their babies and to do so may be psychologically beneficial to both parent and baby. There is anecdotal evidence that some trans women have successfully produced breast milk using protocols developed for adoptive mothers, including mechanical stimulation and prescribed medications to increase milk production.<sup>(22)</sup> For any trans parent, there are techniques and equipment available for simulating breastfeeding, in order to obtain its bonding benefits. Trans parents may choose to use an at-breast suppler (a feeding system in which tubes run from a reservoir to the nipple, supplying milk) whether or not they are lactating (j wallace, personal communication).
- Fenugreek (also called Milk Thistle), a plant native to the mediterranean, contains chemicals which mimic estrogen and has been found to increase breast milk production.<sup>(23)</sup> A prescription drug, domperidone stimulates the production of breast milk by increasing the secretion of prolactin by the pituitary gland through the suppression of dopamine. A study of nursing mothers in the UK found that domperidone increased milk production by 96.3%.<sup>(24)</sup> A Canadian study found no significant differences in the nutritional quality of breast milk produced using domperidone and that produced using a placebo.<sup>(25)</sup> While domperidone has been approved for use in some conditions, such as gastritis, it has not yet been approved to increase milk production, and may be being used off-label (i.e., in ways not yet approved by Health Canada or the US Food & Drug Administration). Health Canada notes that it has been found to cause heart rate and rhythm disorders in some patients.<sup>(26)</sup>



## FOR TRANS PEOPLE WHO CAN BECOME PREGNANT

- Trans people who retain their ovaries and uteri may regain fertility after stopping androgen therapy, even after years of use. This is supported by anecdotal evidence<sup>(4)</sup> and by studies of the recovery of ovary function after exposure to high levels of testosterone.<sup>(5)</sup> However some people may require months or years of testosterone cessation and assisted reproduction technologies to regain fertility and become pregnant.<sup>(6)</sup> Testosterone cannot be taken during pregnancy or breastfeeding as testosterone is toxic to a developing fetus and high testosterone levels may inhibit lactation.<sup>(7-8)</sup>
- Evidence suggests there is an increased prevalence of ovarian abnormalities among trans men, especially symptoms of polycystic ovarian syndrome (PCOS), which can lead to infertility.<sup>(9)</sup> PCOS affects 5-10% of cis (non-trans) women, while the PCOS rate for trans men has been found to range from 58-79.5%.<sup>(10-12)</sup> This association is not due solely to androgen use, as PCOS has been documented in samples of trans men prior to hormone therapy.<sup>(11)</sup>
- Testosterone is not an adequate means of birth control.<sup>(13)</sup> There is anecdotal evidence that some people with internal reproductive organs have become pregnant while taking testosterone. Testosterone will not immediately stop ovulation (egg production), and trans people with ovaries and uteri are most at risk for pregnancy at the beginning of a hormone regime (j wallace, personal communication).
- Some people with uteri, whether partnered or not, may wish to become pregnant using donor sperm. Due to changes in legislation that no longer allow for compensation for sperm donation, sperm donation rates in Canada are very low. Donations of sperm from people of racial or ethnic minorities are particularly scarce.<sup>(37)</sup> Those wishing to conceive with sperm from a racialized donor, or hoping to find a donor whose racial or ethnic identity match their own, face greater barriers as a result of this shortage.
- Unless seeking pregnancy, trans people with internal reproductive organs may not realize they are pregnant since the absence of menses may be normal for them. In the case of an unexpected pregnancy, your client may need assistance in dating the pregnancy, and in assessing any risk to the fetus that may result from hormone use (j wallace, personal communication).
- If your client is seeking to terminate a pregnancy, be prepared to provide support and advocacy for them in accessing an abortion. Abortion providers assume that the people accessing their services will be women and will need to know the correct pronoun, name, and terminology to use for your client (j wallace, personal communication).

## HYSTERECTOMY AND CHEST SURGERY

- For trans people who wish to become pregnant in the future, retaining the ovaries and uterus is desirable. Evidence regarding medical indications for hysterectomy (removal of the uterus) and oophorectomy (removal of the ovaries) after hormonal transition is limited and conflicting.<sup>(14)</sup> Some trans people undergo hysterectomy for psychological benefits, to prevent gynecological cancers (particularly a concern for individuals who do not receive annual pelvic exams), and, in some jurisdictions, in order to change the sex marker on their identification from female to male.<sup>(6, 14-15)</sup> Whether to have a hysterectomy is a decision that should be made with your client, after a full evaluation of the risks and benefits.
- For the best aesthetic results, people considering chest surgery (e.g., double mastectomy, chest reconstruction, or breast reduction) may wish to wait until after any planned pregnancies, as trans men have anecdotally reported that remaining breast tissue swells and grows during pregnancy. Breast tissue may decrease post pregnancy, and can be further reduced by a surgical revision. Trans people who have had chest surgery should be prepared for a small amount of lactation during and immediately following pregnancy, and should be alert to the symptoms of mastitis (inflammation of breast tissue) (j wallace, personal communication). If desired, drugs to stop lactation are also available.
- For those who want to nurse in the future but do not wish to postpone chest surgery, breast reduction is an option, though any chest surgery may jeopardize the ability to nurse successfully (j wallace, personal communication).

## FERTILITY PRESERVATION FOR TRANS PEOPLE WITH OVARIES AND UTERI

- Research suggests that long-term testosterone use does not deplete the ovary follicles (the part of the ovary which contains an egg) or affect the ability of the eggs to mature.<sup>(16)</sup>
- For trans people concerned about fertility loss after testosterone use, or for those planning to have hysterectomies (removal of the uterus) and oophorectomies (removal of the ovaries), there are currently two options for fertility preservation:
  1. **Oocyte (Egg) banking** involves hormone-induced ovulation and the retrieval of the eggs using a needle, guided by ultrasound, inserted through the vaginal wall into the ovary. Many cryogenically frozen eggs do not survive because they are sensitive to the freezing and thawing process.<sup>(6, 16-17)</sup>
  2. **Embryo banking** is egg retrieval (as above) followed by immediate fertilization and banking of the embryo. It has a better success rate, but the sperm donor (whether known or anonymous) must be chosen at the time of the egg retrieval.<sup>(16, 18)</sup>
- Harvested eggs, previously banked eggs or embryos can be implanted into the original donor, into a partner's uterus, or into a gestational carrier and/or surrogate.<sup>(16)</sup>



- The cryopreservation (freezing) of ovarian tissue is currently offered to people undergoing cancer treatment, on an experimental basis.<sup>(17-18)</sup> There is little data regarding its success rate, in terms of resulting live births. In the future, this may be a desirable option for trans people with internal reproductive organs because it does not require hormonal stimulation at the time of preservation.<sup>(6, 16)</sup>
- Current ovary preservation technology requires re-implantation of the ovaries into the original donor and hormonal stimulation to harvest eggs. Although the option is not yet available, in the future, ovarian tissue may be able to produce mature eggs in a laboratory setting.<sup>(19)</sup>
- Decisions concerning fertility preservation should be made as early as possible. After age 30, ovarian tissue rarely has sufficient egg follicles to make cryopreservation practical. Trans people with internal reproductive organs over age 30 should consider freezing embryos or eggs for better results.<sup>(16)</sup>

## REPRODUCTIVE OPTIONS FOR TRANS AND GENDER-VARIANT PRE-PUBESCENT CHILDREN

- The World Professional Association for Transgender Health's Standards of Care recommend that health care providers discuss reproduction with young clients and their parents prior to any treatments that may affect fertility.<sup>(1)</sup>
- In some cases, children may be prescribed gonadotropin releasing hormone analogues (GnRH analogues, or "hormone blockers") to temporarily prevent puberty, leaving the patient in a prepubertal hormonal state until they either reach the age of sixteen or are ready to make a decision about permanent sex (re)assignment.<sup>(27-28)</sup>
- No changes in fertility or increase in birth defects have been reported in adults who were formerly treated with hormone blockers.<sup>(1)</sup> However, initiation of hormone treatment that often accompanies sex (re)assignment prevents the gonads from maturing. If young people who have had pubertal suppression with hormone blockers wish to retain reproductive options before beginning hormone therapy, they will need to wait for sperm production or ovulation to occur (at least three months) in order to bank sperm, eggs or embryos.<sup>(15, 28)</sup> This will result in some level of masculinization or feminization as testosterone and estrogen will now be produced.
- No studies of fertility preservation through in vitro maturation (e.g., allowing sperm cells or ovaries to mature in a lab setting) have been done in prepubescent children. However, experimental work in this area is being done with cisgender (non-trans) youth who are undergoing cancer treatment.<sup>(16, 20)</sup>

## APPROXIMATE COSTS & EFFECTIVENESS

- Fertility preservation is not covered by OHIP, and the cost can be extremely high. It may be possible to claim some uncovered medical costs as a personal tax credit on your income tax.
- Consultations with a clinic may cost \$200 or more. This amount may be billable to OHIP if you have a referral letter from a physician.

- Semen analysis (for motility and viability) can run from \$85-350, and initial freezing and storage of semen can cost \$125-300 and with an additional \$200 per year in annual storage fees. If sperm must be retrieved surgically, this may cost from \$550-1500.
- Preserving eggs can cost \$5000 for the initial procedure, and as much again in annual storage fees. If drugs are needed to initiate the release of eggs these drugs can cost an additional \$4000.
- Preserving frozen embryos costs approximately \$480-650 with \$150-300 in annual storage fees. Transferring a frozen embryo to a uterus for gestation can run between \$540-1100.
- Success rates for assisted human reproductive (AHR) services vary. A French study from 1989 found that 50% of the cis women using frozen sperm had conceived within 6 months of treatment cycles.<sup>(32)</sup> A recent study at the Mayo Clinic found that in terms of pregnancy rates and live births there was no difference between frozen sperm and fresh sperm.<sup>(31)</sup>
- An Italian study found that the fertilization rate of frozen eggs was 73% compared with 83% of non-frozen eggs. Similarly, 91% of non-frozen eggs formed embryos suitable for transfer, compared with 88% of frozen eggs.<sup>(36)</sup>
- Live birth rates for in vitro fertilization (fertilization done inside a lab) range from 10-25%, depending on the age of the person whose eggs are being used.<sup>(33)</sup> In the UK, the rate of live births per in vitro fertilization (IVF) cycle is 5% for those over 42 compared to 30% for those under 35.<sup>(35)</sup>
- AHR may increase the chance of some birth anomalies. A Canadian study of over 61,000 deliveries found that the rate of birth anomalies among children conceived through AHR was 2.91%, compared with a rate of 1.86% non-AHR children. The risk varies by procedure, with ovulation induction resulting in lowest risk (2.35%) and IVF resulting in highest risk (3.45%).<sup>(34)</sup>

## GAPS IN THE RESEARCH

- More research is needed into the success rate of births resulting from the cryopreservation of ovarian tissue. Technological advancements are needed if this option is to become an accessible and affordable fertility preservation option for trans people with ovaries.
- Additional studies are needed into the long-term impact of testosterone use on ovarian tissue and gestational success. While anecdotal evidence shows that trans people using testosterone can become pregnant, controlled studies are needed to determine the likelihood of such pregnancies, both for those desiring to become pregnant and those wishing to avoid doing so.
- Research is needed on the availability of egg, sperm, and embryo storage for trans people, on the availability of AHR services for trans people, and on the competency of assisted reproduction clinics to adequately serve trans clients.
- Both quantitative and qualitative research is needed into the success rate and experience of trans women with breastfeeding. This should include clinical trials of drugs commonly prescribed to increase milk production.



- Much work remains to be done in the area of trans fertility and preservation. Work currently being done on in vitro maturation of reproductive cells with cancer patients would be extended to include prepubescent trans people. Some research has found that trans women express a desire to gestate and carry their own children, and research currently being done on the uterine transplant among cancer patients should also consider the use of such technologies by trans women.<sup>(20)</sup>

## IMPLICATIONS FOR HEALTH CARE PROVIDERS

- Take the initiative to educate yourself on the medical literature related to trans fertility preservation, and on trans issues more broadly, rather than relying upon trans clients for information. Question any assumptions you might have about your clients' experiences, histories, bodies, and desires in relation to fertility. Where appropriate, clients may choose to share information about their individual history, body, and future plans.
- Current standards of care recommend that trans patients make decisions concerning their fertility before starting hormone therapy or undergoing surgery that would alter their ability to reproduce. Such conversations are a key component of consent, even if the client is very young.<sup>(1)</sup>
- Expressing an interest in preserving one's fertility should in no way be construed as ambivalence about one's trans identity. Service providers should continue to use language that corresponds with their clients' gender identity and sexuality. If you aren't sure what terms they prefer, ask your client respectfully and in private.
- Trans people can experience immense amounts of discrimination, and as a result your clients may have significant and justifiable fear about medical settings. Prepare to advocate for and support your client through the options they choose.
- Avoid making assumptions about parenting roles based on biological processes. A trans man, for example, may identify as a father while carrying a child to term and breastfeeding. A trans woman may identify as the mother of a child produced with her sperm. Some, such as genderqueer people, may prefer terms that do not reflect gendered parenting roles.
- While people of any sex/gender may desire to have children, AHR services tend to assume that those donating or banking sperm are men, while those banking embryos or getting pregnant are women. Such assumptions can make accessing fertility clinics challenging for trans people. Referring providers can advocate on their behalf of their clients by calling ahead to explain the situation to the clinic and by clearly indicating the client's preferred name and pronoun on any forms.
- The cryopreservation of ovarian tissue or eggs, which is currently available to some people undergoing cancer treatment, should be made available to trans men about to undergo hormone treatment or surgeries that will affect their future fertility.
- Freezing of sperm, eggs, or ovarian tissue is currently very expensive. To increase health equity providers may wish to support the inclusion of such procedures under OHIP.



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## Resources

To learn more about the Creating Our Families Research project and the results that focused on the experiences of trans people who used Assisted Human Reproduction services in Ontario please see <http://www.lgbtqhealth.ca/projects/creatingourfamilies.php>

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