

SUMMARY OF CLINICAL EVIDENCE FOR GENDER REASSIGNMENT SURGERIES

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Introduction, Background, and Terminology

Gender Dysphoria (previously named Gender Identity Disorder, sometimes used synonymously with Transsexualism) refers to “discomfort or distress that is caused by a discrepancy between a person’s gender identity and that person’s sex assigned at birth (and the associated gender role and/or primary and secondary sex characteristics).”¹ Distress can be severe, resulting in higher prevalence of depression and anxiety.¹⁻⁵ Global prevalence is difficult to ascertain, but recent estimates approximate that transgender people make up 0.3%-0.5% of the total U.S. population.⁶ Treatment for gender dysphoria varies based on individualized assessment for each patient, but generally includes some combination of psychotherapy, cross-sex hormonal therapy, and sometimes surgical intervention.^{1,2,7-10} The goals of treatment for Gender Dysphoria are to minimize dysphoria and help patients function in society in their desired gender role.

In the last 10 years, many professional associations, including the American Medical Association, American Association of Family Physicians, the Endocrine Society, American Psychiatric Association, American Psychological Association, American College of Obstetricians and Gynecologists, and the American Public Health Association, have issued statements or guidelines supporting effective treatment protocols for Gender Dysphoria¹¹, and review articles have been published in major peer-reviewed journals such as *the Journal of the American Medical Association*⁸, *Nature*¹², the *Journal of Clinical Endocrinology*⁵, and *Archives of Pediatric and Adolescent Medicine*¹³, among others. In addition, the World Professional Association for Transgender Health (WPATH, formerly the Harry Benjamin International Gender Dysphoria Association) has issued global standards of care since 1979; currently, the 7th version is under revision. The WPATH Standards of Care are internationally recognized as the most comprehensive and evidence-based set of recommendations for treating gender dysphoria.

The following summarizes clinical evidence of necessity, effectiveness, and safety for surgical procedures for treatment of gender dysphoria. The essential purpose of transition-related treatment, whether it is genital reconstruction, hormone replacement therapy or any other gender-confirming procedure, is to therapeutically treat Gender Dysphoria, not to improve a person’s appearance. The evaluation of medical necessity must be individualized to each patient and take into account the totality of the patient’s total appearance and transition-related needs. Transgender people have unique clinical needs that are distinct from those of non-transgender people, and individualized assessments should be based on their symptoms, functionality, and the totality of their appearance. As such, an individual may require none, some, or (rarely) all of the surgical procedures described in order to effectively treat their gender dysphoria.

Gender reassignment is the only treatment for gender dysphoria that has been evaluated empirically with large clinical case series.¹⁴ Overall, gender reassignment surgeries have been found safe, effective, and necessary in treating gender dysphoria.^{1,8,9,14-17} Feelings of regret are extremely rare and, where present, mostly transient.¹⁸⁻²³ Access to transition-related care not only results in reduction of dysphoria and improved psychological outcomes,²⁴ but is also linked to improved primary care outcomes. Transgender women who accessed transition-related care were less likely to have injected silicone²⁵ or to have HIV-associated illnesses.²⁶ HIV-positive transgender women who receive transition-related care are more likely to be engaged in HIV primary care, have higher antiretroviral adherence and achieve undetectable viral loads.²⁶ Utilization of transition-related medical care has been associated with significantly lower rates of suicide, binge drinking, and non-injection drug use.²⁷

Categories of Gender Reassignment Surgery

The category of Gender Reassignment Surgery (GRS) includes:

1. Breast/chest surgeries;
2. Genital surgeries;
3. Other surgeries.

For the Female-to-Male (FTM) patient, Surgical procedures may include the following:

1. Breast/chest surgery: subcutaneous mastectomy, nipple grafts, chest reconstruction;
2. Genital surgery: hysterectomy/salpingo-oophorectomy, metoidioplasty, phalloplasty (employing a pedicled or free vascularized flap), reconstruction of the fixed part of the urethra, vaginectomy, vulvectomy, scrotoplasty, and implantation of erection and/or testicular prostheses;
3. Other: voice surgery (rare), liposuction, lipofilling,

For the Male-to-Female (MTF) patient, surgical procedures may include the following:

1. Breast/chest surgery: mammoplasty;
2. Genital surgery: orchiectomy, penectomy, vaginoplasty, clitoroplasty, vulvoplasty. Labiaplasty, urethroplasty, prostatectomy;
3. Other surgeries: reconstructive facial feminization surgery, liposuction, lipofilling, voice surgery, thyroid cartilage reduction, electrolysis or laser hair removal, and hair reconstruction.

Summaries of Clinical Evidence for Gender Reassignment Surgeries

Surgeries for Female-to-Male (FTM) individuals

Breast/Chest Surgery

Mastectomy for transgender men is necessary for many in order to resolve Gender Dysphoria.^{1,8,9,16,28,29} When bilateral (double-incision) mastectomy is performed, nipple grafts are a necessary component of the surgery; when “keyhole” (periareolar incision) is performed, nipple grafts are less likely necessary, but may be important in some cases.^{16,29} Both procedures are highly effective, and in either type, reconstruction of the chest to approximate a normal male chest is a necessary component.^{16,28–30} In follow-up studies, transgender men who have undergone mastectomy report very low rates of complication and high rates of satisfaction; scarring is generally within expected limits and necrosis of nipple grafts is rare.^{1,8,14,20,28,31–35} Chest reconstruction surgery in combination with hormone therapy has been shown to be more effective in alleviating gender dysphoria than hormones alone.³⁶ Quality of life is higher among transgender men who have undergone chest reconstruction than those who have not.^{37,38}

Genital Surgeries

Three procedures may be indicated for transgender men whose gender dysphoria affects the genitals. Hysterectomy and salpingo-oophorectomy may be performed transvaginally or through abdominal incision, including laparoscopic techniques; the cervix may be removed or left intact; the procedures are safe, with complication rates comparable to the non-transgender population, and effective in reducing gender dysphoria.^{16,39–43} If distress related to external genitals is present, patients should receive individualized assessment to determine if metoidioplasty or phalloplasty will be more effective in reducing gender dysphoria.^{2,15,16} Both procedures are highly effective in treating gender dysphoria and have low complication rates; when complications do occur, they are relatively minor and can be treated easily.^{15,16,23,34,38,44,45} Phalloplasty may be safely performed using either a free or pedicled flap technique.^{16,44,46–51} Urethral lengthening is required as a component of phalloplasty and is often necessary for metoidioplasty.^{16,44,52–56}

Other Surgeries

Surgeries for Male-to-Female (MTF) individuals

Breast/Chest Surgery

In transgender women who undergo hormone therapy, maximal breast development is reached within 2 years; in 40-50% of cases, hormone therapy alone is sufficient to achieve breast size appropriate to age and body dimensions, but in the remaining majority, breast reconstruction may be necessary in order for the individual to pass as female and thereby reduce or resolve gender dysphoria.⁵⁷⁻⁵⁹ Frequently, maximal breast growth after hormone use resembles breast development levels associated in size and shape with the Tanner II stage of puberty.^{60,61} Mammoplasty in transgender women serves a primarily therapeutic purpose and should be considered reconstructive.^{9,22,62} In a recent cohort study, psychosocial wellbeing improved after breast reconstruction, indicating that the procedure is effective in reducing gender dysphoria.²² Safety is a paramount issue underscoring the necessity of access to breast reconstruction as well, as transgender women who are unable to access safe methods of breast reconstruction sometimes resort to injection of non-medical grade silicone to obtain breast shape and size. In one recent report of complications related to silicone injection, transgender women, who overall represent less than 1% of all women in the general population, accounted for 45% of cases in a recent review article.⁶³

Genital Surgeries

Genital surgeries for transgender women generally fall into two types: orchiectomy, performed alone or as part of vaginoplasty, and procedures associated with vaginoplasty (penectomy, vaginoplasty, clitoroplasty, vulvoplasty, labiaplasty, urethroplasty, and sometimes prostatectomy). Whether or not assessment indicates vaginoplasty is necessary to resolve an individual's gender dysphoria, orchiectomy may be indicated separately, especially in order to remove reliance on androgen-suppressive therapy in the long term and to prevent prostatic cancers.^{1,7,16,64,65}

Vaginoplasty has been shown to be necessary, safe, and effective in treating gender dysphoria. The procedure may be performed using skin grafts or flaps; the most common technique involves inversion of an anteriorly pedicled penile skin flap in combination with a small dorsally based scrotal flap.^{9,15-17,66} Follow-up studies indicate high satisfaction, improved sexual, physical, and psychosocial health, and reduction of gender dysphoria.^{14,18,19,21,23,33,34,34,35,66-72} Follow-up studies have found small numbers of complications, including rectal-vaginal fistula, vaginal stenosis, urethral stenosis, clitoral necrosis, vaginal prolapse, and vaginal hair, all of which were rare.^{16,17,19,21,23,66} In one follow-up study of 232 individuals who underwent vaginoplasty with the same surgeon, approximately one third reported misdirected urinary stream, which was not associated with higher or lower satisfaction with the procedure.¹⁹

Other Surgeries

Other surgeries or procedures that may be necessary to resolve gender dysphoria and allow transgender women to navigate the world in the desired gender role (as a woman) include facial and body hair removal, reconstructive facial feminization surgery, reduction thyroid chondroplasty, and hair reconstruction.^{1,14,16,17} These procedures are not cosmetic, but rather serve a primarily reconstructive purpose by allowing transgender women whose overall physical appearance otherwise prevents them from being perceived as female.

A recent review article defines reconstructive facial feminization surgery as “a broad range of cranio-maxillofacial surgical procedures and techniques with the sole objective of converting a masculine face to a more feminine one. There is no attempt to convert the face into that of a fashion model as all that is usually desired by the individual is to pass as a female in everyday society and to integrate as well as possible into the community.”⁷³ Facial cues serve as a primary basis for making a determination of gender, and these determinations take just over one hundredth of a second to make.^{62,74} As hormone treatment and other surgical interventions provide no significant changes to facial structure,

reconstructive facial feminization is a critical component of transition for many transgender women, in order to participate in society as a woman and avoid gender-based violence and discrimination.⁷⁵⁻⁷⁹

Facial feminization is highly effective, with high rates of satisfaction;^{62,73,74,76,77,79-82} in one study, it was associated with higher quality of life, compared to transgender women who had undergone no surgery or only genital surgery.⁶² In another, participants were asked to determine the gender of a person based on photographs of the upper, middle, or lower regions of the face; participants correctly identified transgender women who had undergone reconstructive facial feminization more than 80% of the time, compared to expected values of 4% for those who had not undergone the surgery.⁷⁴ The same study found that less than 2% of 168 transgender women who had undergone reconstructive facial feminization experienced complications. Another study analyzed the results of 214 transgender women who had undergone reconstructive facial feminization and found no serious complications, no new emergency surgical operations, and no necessity to drain seromas or hematomas; one patient had a fistula along an incision, which resolved on its own.⁸⁰ Removal of facial and body hair through electrolysis or laser instruments provides another necessary treatment that allows perceptions of gender based on secondary sex characteristics, and particularly facial cues, to correctly identify transgender women as women.^{1,16,17,83} One study noted a mean of 90% hair clearance using an Intense Pulsed Light Source (laser) and that clearance rates did not differ based on whether the individual had undergone any hormone therapy.⁸³

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