Healthcare for Transgender/Gender Non-conforming Individuals
Endocrinologist’s Perspective

Psychiatry in Medical Settings 2017
February 9, 2017

Todd B. Nippoldt, MD
Division of Endocrinology
Mayo Clinic College of Medicine
Rochester, MN, USA
No Financial relationships to disclose

All cross hormone therapy is off-label use
Objectives

• Understand the differences between sex, gender identity, sexual preference and gender expression

• Be able to use the appropriate terminology

• Become aware of the health disparities, social discrimination and violence faced by this population

• Identify specific medical risks influenced by feminizing and masculinizing hormone therapy

• Appreciate the components of, expected changes, time line and outcomes of cross hormone therapy
Transgender 101

Sex
Chromosomal and Anatomic

Gender Identity
Internal sense of being male, female or along the spectrum

Sexual Orientation
The gender(s) a person is attracted to

Self

Gender Expression
How one manifests one’s self through social norms of masculine, feminine or variant
Being Transgender or Gender non-conforming

• Indicates a person’s Diversity
• Does not describe a Disease
• Is not a choice
  • Desire to live authentically in their intrinsic gender
  • Problems stem from
    • Internal conflict
    • non-acceptance in society
Gender Dysphoria (DSM-V)

- Incongruence between experienced/expressed gender and 1° & 2° sex characteristics
- Strong desire
  - to be rid of one’s 1° & 2° sex characteristics
  - to have 1° & 2° sex characteristics of the other gender
  - to be of the other gender
  - to be treated as the other gender
- Strong conviction that one has the typical feelings and reactions of the other gender
- Associated with clinically significant distress or functional impairment
Gender Identity Terminology

Current accepted term

- Transgender
- Gender non-conforming
- Non-binary
- Gender queer
- Transwoman, Male to Female, MTF
- Transman, Female to male, FTM
- Crossdresser

Explanation/older terms

- Encompasses all/Trans-sexual
- Encompasses all, Often used in reference to children
- Identifies as not fully male or female – along the spectrum
- Often used after some transition has occurred – social, medical or surgical
- Dresses as other gender for pleasure, entertainment/Transvestite
Differences of Sexual Development, DSD

- A variety of congenital conditions in which development of chromosomal, gonadal, or anatomic sex is atypical

- **Involves one of the following elements**
  - congenital development of ambiguous genitalia (e.g. virilizing CAH)
  - congenital disjunction of internal and external sex anatomy (e.g. Androgen Insensitivity Syndrome)
  - incomplete development of sex anatomy (e.g. vaginal agenesis; gonadal agenesis)
  - sex chromosome anomalies (e.g. Turner Syndrome; Klinefelter Syndrome)
  - disorders of gonadal development (e.g. ovotestes)

- **Older terminology**
  - Disorders of Sexual Development
  - Intersex
  - Hermaphrodite

- **Independent of gender identity**
Prevalence in the United States
Flores, AR et. Al., The Williams Institute, June 2016

- 0.6 % of US population identify as transgender
- ~ 1.4 million people in US
- Prevalence varies by state
  - Hawaii – 0.8%
  - North Dakota – 0.3%
Relief of Dysphoria is the goal of “treatment”

• Self acceptance and affirmation
• Social transition
  • Dress, hair, make-up, voice therapy, gait
• Cross hormone therapy
• Surgical procedures – Gender confirming surgery
  • Facial feminization
  • breast augmentation or reduction
  • hair removal
  • body contouring
  • genital reconstruction
THE REPORT OF THE
2015 U.S. TRANSGENDER SURVEY
Health disparities, social discrimination and violence
Public Spaces

<table>
<thead>
<tr>
<th>LOCATION VISITED</th>
<th>% OF THOSE WHO SAID STAFF KNEW OR THOUGHT THEY WERE TRANSGENDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transportation</td>
<td>34%</td>
</tr>
<tr>
<td>Retail store, restaurant, hotel, or theater</td>
<td>31%</td>
</tr>
<tr>
<td>Drug or alcohol treatment program</td>
<td>22%</td>
</tr>
<tr>
<td>Domestic violence shelter or program or rape crisis center</td>
<td>22%</td>
</tr>
<tr>
<td>Gym or health club</td>
<td>18%</td>
</tr>
<tr>
<td>Public assistance or government benefit office</td>
<td>17%</td>
</tr>
<tr>
<td>Department of Motor Vehicles (DMV)</td>
<td>14%</td>
</tr>
<tr>
<td>Nursing home or extended care facility</td>
<td>14%</td>
</tr>
<tr>
<td>Court or courthouse</td>
<td>13%</td>
</tr>
<tr>
<td>Social Security office</td>
<td>11%</td>
</tr>
<tr>
<td>Legal services from an attorney, clinic, or legal professional</td>
<td>6%</td>
</tr>
</tbody>
</table>
More than half (59%) of respondents avoided using a public restroom in the past year because they were afraid of confrontations or other problems they might experience.
Health disparities, social discrimination and violence at school

Nearly one-quarter (24%) of those who were out or perceived as transgender in school were physically attacked because of being transgender.

<table>
<thead>
<tr>
<th>Experiences</th>
<th>% of those who were out or perceived as transgender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbally harassed because people thought they were transgender</td>
<td>54%</td>
</tr>
<tr>
<td>Not allowed to dress in a way that fit their gender identity or expression</td>
<td>52%</td>
</tr>
<tr>
<td>Disciplined for fighting back against bullies</td>
<td>36%</td>
</tr>
<tr>
<td>Physically attacked because people thought they were transgender</td>
<td>24%</td>
</tr>
<tr>
<td>Believe they were disciplined more harshly because teachers or staff thought they were transgender</td>
<td>20%</td>
</tr>
<tr>
<td>Left a school because the mistreatment was so bad</td>
<td>17%</td>
</tr>
<tr>
<td>Sexually assaulted because people thought they were transgender</td>
<td>13%</td>
</tr>
<tr>
<td>Expelled from school</td>
<td>6%</td>
</tr>
<tr>
<td>One or more experiences listed</td>
<td>77%</td>
</tr>
</tbody>
</table>

Health disparities, social discrimination and violence
Housing, employment and poverty

More than one-quarter (27%) of those who held or applied for a job in the past year reported not being hired, being denied a promotion, or being fired during that year because of their gender identity or expression.

The unemployment rate for USTS respondents was 15%, three times the unemployment rate in the U.S. population.

Nearly one-third (29%) of respondents were living in poverty, more than twice the rate in the U.S. population (14%).

Figure 13.2: Lifetime homelessness rate among transgender women
RACE/ETHNICITY (%)
Table 14.1: Mistreatment by police or other law enforcement officers in the past year

<table>
<thead>
<tr>
<th>Experiences of mistreatment in the past year</th>
<th>% of those who interacted with officers who thought or knew they were transgender in the past year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Officers kept using the wrong gender pronouns (such as he/him or she/her) or wrong title (such as Mr. or Ms.)</td>
<td>49%</td>
</tr>
<tr>
<td>Verbally harassed by officers</td>
<td>20%</td>
</tr>
<tr>
<td>Officers asked questions about gender transition (such as about hormones or surgical status)</td>
<td>19%</td>
</tr>
<tr>
<td>Officers assumed they were sex workers</td>
<td>11%</td>
</tr>
<tr>
<td>Physically attacked by officers</td>
<td>4%</td>
</tr>
<tr>
<td>Sexually assaulted by officers</td>
<td>3%</td>
</tr>
<tr>
<td>Forced by officers to engage in sexual activity to avoid arrest</td>
<td>1%</td>
</tr>
<tr>
<td>One or more experiences listed</td>
<td>58%</td>
</tr>
</tbody>
</table>

Respondents who were incarcerated were five to six times more likely than the general incarcerated population to be sexually assaulted by facility staff, and nine to ten times more likely to be sexually assaulted by another inmate.
Health disparities, social discrimination and violence
Substance abuse, HIV

Almost one-third (29%) of respondents reported illicit drug use, marijuana consumption, and/or nonmedical prescription drug use in the past month, compared with 10% of the U.S. population.

The rate of respondents living with HIV (1.4%) was nearly five times higher than in the U.S. population (0.3%).

Current tobacco smokers

USTS respondents = 22%

US population = 21%
Health disparities, social discrimination and violence

Sexual Assault

One in ten (10%) respondents in the survey were sexually assaulted in the past year.

Figure 15.15: Lifetime sexual assault 
RACE/ETHNICITY (%)

- American Indian: 65%
- Asian: 53%
- Black: 58%
- Latinx: 59%
- Middle Eastern: 45%
- Multiracial: 47%
- White: 41%
Health disparities, social discrimination and violence

Psychological Distress

Lifetime suicide attempts

- **US population**: 4.6%
  - Nock & Kessler, 2006 J Abn Psychol
  - http://www.samhsa.gov/data

- **LGB adults**: 10 – 20%

- **Transgender adults**: 25 – 43%
  - 13 surveys 2012 to 2016
  - US and other countries
Health disparities, social discrimination and violence

Attempted Suicide

Seven percent (7%) of all respondents attempted suicide in the past year, nearly twelve times the rate of attempted suicide in the U.S. population (0.6%).

Forty percent (40%) of respondents have attempted suicide in their lifetime, nearly nine times the rate reported in the U.S. population (4.6%).


Impact of Strong Parental Support for Trans Youth

- Parent(s) very supportive
- Parent(s) somewhat to not at all supportive

<table>
<thead>
<tr>
<th>Category</th>
<th>Supportive</th>
<th>Somewhat</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfied with life</td>
<td>72%</td>
<td>33%</td>
<td>15%</td>
</tr>
<tr>
<td>VG/Ex Physical Health</td>
<td>66%</td>
<td>31%</td>
<td>15%</td>
</tr>
<tr>
<td>VG/Ex Mental Health</td>
<td>70%</td>
<td>31%</td>
<td>15%</td>
</tr>
<tr>
<td>High Self Esteem</td>
<td>64%</td>
<td>31%</td>
<td>13%</td>
</tr>
<tr>
<td>Intent to Parent</td>
<td>58%</td>
<td>31%</td>
<td>13%</td>
</tr>
<tr>
<td>Adequate Housing</td>
<td>100%</td>
<td>42%</td>
<td>4%</td>
</tr>
<tr>
<td>Adequate Food</td>
<td>92%</td>
<td>82%</td>
<td>15%</td>
</tr>
</tbody>
</table>

* Significant difference, p < 0.05

A report prepared for Children’s Aid Society of Toronto and Delisle Youth Service TransPulse; October 2012
Impact of Strong Parental Support for Trans Youth

- Parent(s) very supportive
  - Depressive symptoms: 23%
  - Considered suicide, past year: 34%
  - Suicide attempt, past year: 4%

- Parent(s) somewhat to not at all supportive
  - Depressive symptoms: 75%
  - Considered suicide, past year: 70%
  - Suicide attempt, past year: 57%

* Significant difference, p < 0.05

A report prepared for Children’s Aid Society of Toronto and Delisle Youth Service TransPulse; October 2012
Negative experiences among those with supportive and unsupportive families

- Experienced homelessness: 27% of respondents whose families were supportive vs. 45% of respondents whose families were unsupportive
- Attempted suicide: 37% of respondents whose families were supportive vs. 54% of respondents whose families were unsupportive
- Currently experiencing serious psychological distress: 31% of respondents whose families were supportive vs. 50% of respondents whose families were unsupportive

Health disparities, social discrimination and violence
Fear of Mistreatment by Healthcare Providers

Figure 7.6: Did not see health provider due to fear of mistreatment in the past year
RACE/ETHNICITY (%)

Nearly one-quarter (23%) of respondents reported that they avoided seeking health care they needed in the past year due to fear of being mistreated as a transgender person.
# Prevalence of suicide attempts in transgender individuals

## Factors Increasing Risk

<table>
<thead>
<tr>
<th>Overall (n = 6456)</th>
<th>41%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family chose to not speak/spend time with them</td>
<td>57%</td>
</tr>
<tr>
<td>Harassed or bullied at school</td>
<td>50 – 54%</td>
</tr>
<tr>
<td>Discrimination or harassment at work</td>
<td>50 – 59%</td>
</tr>
<tr>
<td><strong>Doctor or healthcare worker refused to treat them</strong></td>
<td><strong>60%</strong></td>
</tr>
<tr>
<td>Suffered physical or sexual violence at work</td>
<td>64 – 65%</td>
</tr>
<tr>
<td>Suffered physical or sexual violence at school</td>
<td>63 – 78%</td>
</tr>
<tr>
<td>Disrespected or harassed by law enforcement</td>
<td>57 – 61%</td>
</tr>
<tr>
<td>Suffered physical or sexual abuse by law enforcement</td>
<td>60 – 70%</td>
</tr>
<tr>
<td>Experienced homelessness</td>
<td>69%</td>
</tr>
</tbody>
</table>

Haas, Rodgers, Herman; Jan 2014; http://williamsinstitute.law.ucla.edu
Top ten tips for a trans-friendly and competent clinic

Caroline Davidge-Pitts, MD

1. If you are not sure, ask. This reflects empathy.

2. Ask the patient their preferred name and pronoun and use these during the encounter. If you make a mistake, apologize and continue.

3. The preferred name and pronoun will often differ from what is in the medical record as many have not changed their name and gender legally. Ask the patient if you can use this preferred name and pronoun in the medical record. Remember that many patients may have access to their medical record and therefore your sensitivity should be reflected in the notes.

4. If possible, intake forms should have an option to disclose transgender status.

5. Sensitivity training should be required for all staff that interacts with the patient. A helpful link from the University of California, San Francisco: [http://transhealth.ucsf.edu/video/story.html](http://transhealth.ucsf.edu/video/story.html)
6. Creation of private, unisex bathrooms is preferable

7. Have local transgender resources available to help guide the patient if needed e.g. Local transgender support groups

8. Include transgender health topics as part of your medical school and residency programs. This will increase the competence of our future leaders in transgender healthcare.

9. Provide faculty development in transgender health. Many national and international meetings now include transgender health topics, and online resources are becoming more available.

10. Phone-a-friend. Be aware of trans-competent providers in your area that you can contact if you have a question.
Cross Hormone Therapy

General Principles

• Suppress and/or block biologic hormone

• Gradually increase cross sex hormone

• Monitor blood tests
  • Hormone levels – goal normal range of desired sex
  • electrolytes, lipids, liver enzymes

• Monitor clinically
  • Secondary sex characteristics development

• Preventative Health
  • Follow guidelines for age appropriate biologic sex
  • For new risks resulting from cross sex hormones
Prior to initiating hormone transition

- Assess health of endogenous reproductive organs
  - Age and (endogenous) sex appropriate screening
  - Physical exam, hormone levels, ? DSD

- Identify and manage issues influencing potential risks
  - Thombosis, substance use, obesity, metabolic, bone

- Check labs that may affect/be affected by treatment
  - Lipids, FBG, CBC, AST, creatinine, Na, K
  - Testosterone and estradiol levels

- Immunizations, including HPV

- Discuss fertility issues/cryopreserve sperm or eggs

- Identify a social support system
Feminizing Hormone Therapy

Typical Regimen

- **Spironolactone**
  - Final dose range: 200 to 300 mg/day

- **Estradiol**
  - Oral, transdermal, IM or SQ injection
  - Avoid oral if > 40 years, higher risk of DVT
  - Final dose range: 1X to 4X menopausal doses
  - Testosterone level: Normal female range
  - Estradiol level: typically ≤ 200 pg/ml
Feminizing Hormone Therapy

Typical Regimen

- **Progesterone** – controversial, ? Improves
  - Breast development
  - Breast contour
  - Nipple/areolar development

- **Electrolysis, laser hair removal**
  - **Finasteride** – male pattern baldness
    - 5α reductase inhibitor

- **Voice therapy**
Feminizing Hormone Therapy
Potential Risks

**Likely**
- Venous thromboembolism
- Hypertriglyceridemia
- Gallstones
- Weight gain
- Elevated LFTs
- Decreased libido, ED, infertility
- Hyperkalemia

**Possible**
- Hypertension
- Hyperprolactinemia/prolactinoma
- Type 2 DM*
- CV disease*
  *with other risk factors
- Breast cancer

**Unlikely**
- Breast cancer
Feminizing Hormone Therapy
Expectations/Timeline

Breast development
3-6 months

Body habitus
Fat redistribution
Decreased muscle mass
3-6 months

Hair
Male pattern baldness
slows 1-3 months
Softer body hair 6-12 months

Skin
Soft, less oily 3-6 months

Sexual function
Decreased libido and spontaneous erections
1-3 months
Testicular atrophy 3-6 months
## Feminizing Hormone Therapy
### Improvement after Hormone Therapy

<table>
<thead>
<tr>
<th>n = 67</th>
<th><strong>Hormone therapy</strong></th>
<th></th>
<th><strong>p</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>With out</td>
<td>With</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>SSEI</td>
<td>125.1 ± 23.9</td>
<td>146.5 ± 20.0</td>
</tr>
<tr>
<td>Depression</td>
<td>BDI</td>
<td>5.0 ± 5.9</td>
<td>1.7 ± 3.1</td>
</tr>
<tr>
<td>QoL</td>
<td>SQUALA PWB</td>
<td>10.9 ± 3.8</td>
<td>13.3 ± 4.3</td>
</tr>
<tr>
<td>QoL</td>
<td>SQUALA TCOS</td>
<td>9.0 ± 3.0</td>
<td>11.5 ± 3.6</td>
</tr>
</tbody>
</table>

Adapted from: J Nerv Ment Dis 2013;201: 996 -1000
Masculinizing Hormone Therapy
Typical Regimen

- **Testosterone**
  - IM/SQ injection, transdermal, pellets
  - Final dose range: 0.5X to 1X male doses
  - Testosterone level: normal male range
    - first 3–9 months total T may be high, free T normal, due to high SHBG levels
  - Estradiol level: normal male range

- **Progesterone**
  - May be needed to stop menses in some patients
  - Micronized progesterone 100-200 mg daily x 3 m
Masculinizing Hormone Therapy
Potential Risks

**Likely**
- Polycythemia
- Weight gain
- Acne
- Balding
- Sleep apnea

**None**
- Breast, cervical cancer

**Inconclusive**
- Ovarian, uterine cancer

**Possible**
- Elevated LFTs
- Dyslipidemia
  - Higher risk in PCOS
- Exacerbation of underlying manic or psychotic disorder
- Hypertension*
- Type 2 DM*
- CV disease*

*only with other risk factors
Masculinizing Hormone Therapy
Expectations/Timeline

Voice
Deepens 3-12 months

Hair
Facial and body hair growth 3-6 months
Scalp hair loss > 12 months

Skin
Oily skin, acne 1-6 months

Body habitus
Fat redistribution
3-6 months
Increased muscle mass
6-12 months

Sexual function
Cessation of menses
2-6 months
Clitoral enlargement
3-6 months
Outcomes – Meta-analysis
Murad et al, Clinical Endocrinology (2010)

- 28 eligible studies
  - 1833 individuals with gender dysphoria (1093 MTF, 801 FTM)
  - Hormonal therapy and gender confirming surgery
- 80% significant improvement in gender dysphoria
- 78% significant improvement in psychological symptoms
- 80% reported significant improvement in quality of life
- 72% reported significant improvement in sexual function
Gender Confirmation Surgery

- Top Surgery
  - Breasts
- Bottom Surgery
  - Genitalia
- Body contouring procedures
- Facial Feminization procedures
- Voice feminization
  - Therapy
  - Surgery
Male to Female Procedures

Table 7.5: Procedures among respondents with male on their original birth certificate

<table>
<thead>
<tr>
<th>Type of procedure</th>
<th>Have had it</th>
<th>Want it some day</th>
<th>Not sure if they want this</th>
<th>Do not want this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair removal or electrolysis</td>
<td>41%</td>
<td>49%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Voice therapy (non-surgical)</td>
<td>11%</td>
<td>46%</td>
<td>19%</td>
<td>24%</td>
</tr>
<tr>
<td>Vaginoplasty or labiaplasty</td>
<td>10%</td>
<td>45%</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>Augmentation mammoplasty</td>
<td>8%</td>
<td>36%</td>
<td>31%</td>
<td>24%</td>
</tr>
<tr>
<td>Orchietomy</td>
<td>9%</td>
<td>40%</td>
<td>24%</td>
<td>27%</td>
</tr>
<tr>
<td>Facial feminization surgery</td>
<td>6%</td>
<td>39%</td>
<td>30%</td>
<td>25%</td>
</tr>
<tr>
<td>Tracheal shave</td>
<td>4%</td>
<td>29%</td>
<td>29%</td>
<td>38%</td>
</tr>
<tr>
<td>Silicone injections^{28}</td>
<td>2%</td>
<td>9%</td>
<td>27%</td>
<td>61%</td>
</tr>
<tr>
<td>Voice surgery</td>
<td>1%</td>
<td>16%</td>
<td>32%</td>
<td>51%</td>
</tr>
<tr>
<td>Other procedure not listed</td>
<td>5%</td>
<td>13%</td>
<td>15%</td>
<td>67%</td>
</tr>
</tbody>
</table>
Male to Female Gender Confirming Surgery
Breast Augmentation

For best results do surgery at least one year after feminizing hormone therapy and breast development plateaus.
Male to Female Gender Confirmation Surgery
Penile Inversion Vaginoplasty

Approximate Location of Neo-Vagina after GRS
Adapted from gendersong.com

Normal Male Urinary Bladder and Prostate

Photos courtesy of Dr. Chetawut, Bangkok
Satisfaction With MTF GRS Penile inversion vaginoplasty

How do you see yourself today?

**Appearance**
- Very satisfied: 26.2%
- Satisfied: 61.2%
- Dissatisfied: 8.7%
- Very dissatisfied: 3.9%

**Function**
- Very satisfied: 34.4%
- Satisfied: 37.6%
- Mostly satisfied: 19.4%
- Dissatisfied: 6.5%
- Very dissatisfied: 2.2%

**Sexual Identity**
- As a woman: 10.7%
- More female than male: 2.9%
- More male than female: 1.0%
- As a man: 1.0%

Male to Female Gender Confirmation Surgery
Voice Feminization Surgery

CENTER FOR THE CARE OF THE PROFESSIONAL VOICE
Table 7.4: Procedures among respondents with female on their original birth certificate

<table>
<thead>
<tr>
<th>Type of procedure</th>
<th>Have had it</th>
<th>Want it some day</th>
<th>Not sure if they want this</th>
<th>Do not want this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest surgery reduction or reconstruction</td>
<td>21%</td>
<td>52%</td>
<td>17%</td>
<td>10%</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>8%</td>
<td>44%</td>
<td>28%</td>
<td>19%</td>
</tr>
<tr>
<td>Metoidioplasty</td>
<td>1%</td>
<td>15%</td>
<td>37%</td>
<td>47%</td>
</tr>
<tr>
<td>Phalloplasty</td>
<td>1%</td>
<td>11%</td>
<td>31%</td>
<td>56%</td>
</tr>
<tr>
<td>Other procedure not listed</td>
<td>3%</td>
<td>7%</td>
<td>13%</td>
<td>77%</td>
</tr>
</tbody>
</table>
Female to Male Gender Confirming Surgery
Breast reduction, chest masculinization

Patient satisfaction  $n = 158$

1 = very good  77 (48.7%)

2 = good  62 (39.3%)

3 = less satisfied  18 (11.4%)

4 = not satisfied  1 (0.6%)

Female to Male Gender Confirming Surgery
Metoidioplasty

- uses the (hypertrophied) clitoris to reconstruct the microphallus

- the suspensory ligament of the clitoris is detached from the pubic bone, allowing the clitoris to extend out further

- voiding while standing cannot be guaranteed

- sexual intercourse will not be possible


Brownstein & Crane Surgical Services
Female to Male Gender Confirming Surgery Phalloplasty

- Aesthetically appealing neophallus
- Erogenous and tactile sensation
- Enables voiding while standing
- Allows sexual intercourse
  - Erection prosthesis required in most techniques
- Provide a normal appearing scrotum
- No functional loss in the donor area

- Various techniques – site of donor flap
  - Radial forearm, suprapubic, thigh, fibular, latissimus dorsi

Female to Male Gender Confirming Surgery
Phalloplasty


Brownstein & Crane Surgical Services