

---

# Issues in transgender dermatology: A systematic review of the literature



Patrick Sullivan, MD,<sup>a</sup> John Trinidad, MD MPH,<sup>b</sup> and Dathan Hamann, MD<sup>b,c</sup>  
*Cincinnati and Columbus, Ohio, and Phoenix, Arizona*

**Background:** Transgender patients have many unique dermatologic needs, yet the literature concerning dermatologic care of transgender individuals is lacking.

**Objective:** We aimed to provide a systematic review of the literature on dermatology care in transgender individuals to provide a foundation for future research and education.

**Methods:** We systematically reviewed peer-reviewed published studies that examined dermatologic treatment of transgender patients.

**Results:** A total of 110 articles met the inclusion criteria for systematic review.

**Limitations:** Because of a lack of quantitative research in transgender dermatology, much of the available literature included in this review relies on case reports and expert opinions.

**Conclusion:** Dermatologists have the ability to greatly affect the care of transgender patients, and there are ample opportunities for dermatologists to expand the literature pertaining to this population. (J Am Acad Dermatol 2019;81:438-47.)

**Key words:** acne; dermatologic; dermatology; hair; LGBT; trans persons; skin; transgender.

As of 2011, an estimated 0.3% of adults identified as transgender in the United States.<sup>1</sup> The dermatologic health concerns unique to this community are important for providing our patients with excellent care. Literature and education concerning dermatologic care of transgender patients is in the early stages. Much of the available literature on this population relates to transition-related care and HIV status. Not only is research lacking, but issues in transgender dermatology are under-represented in the dermatology curriculum.<sup>2</sup> Here we provide a systematic review of the literature on dermatology care in transgender individuals to provide a foundation for future research and education. In this article, male-to-female transgender individuals (women assigned the male sex at birth) will be identified as transgender women or simply as women and female-to-male transgender individuals (men assigned the female

sex at birth) will be identified as transgender men or simply as men. Additional definitions of terms can be found in [Table I](#).

## MATERIALS AND METHODS

The authors systematically reviewed peer-reviewed published studies that examined dermatologic treatment of transgender patients. We searched the medical database PubMed, and studies that fulfilled the inclusion criteria were identified. The following search terms were used: *transgender* OR *LGBT* AND *dermatology* OR *dermatologic* OR *acne* OR *verruca* OR *skin*. No limit was set regarding the range of years. We also identified relevant studies by using the reference lists of included articles. The last search was run on April 12, 2018. Abstracts were reviewed and articles that did not contain original research and opinion articles were not included. The references of these articles were also reviewed and

---

From the Department of Internal Medicine, University of Cincinnati<sup>a</sup>; Division of Dermatology, The Ohio State University, Columbus<sup>b</sup>; and The Contact Dermatitis Institute, Phoenix.<sup>c</sup>

Funding sources: None.

Conflicts of interest: None disclosed.

Accepted for publication March 9, 2019.

---

Reprint requests: Patrick Sullivan, MD, 231 Albert Sabin Way, P.O. Box 670557, Cincinnati, Ohio 45267-0557. E-mail: [Sullivpd@ucmail.uc.edu](mailto:Sullivpd@ucmail.uc.edu).

Published online March 15, 2019.  
0190-9622/\$36.00

© 2019 Published by Elsevier on behalf of the American Academy of Dermatology, Inc.

<https://doi.org/10.1016/j.jaad.2019.03.023>

examined for relevant articles. The process has been outlined in Fig 1 (a Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram).<sup>3</sup>

## RESULTS

A total of 110 articles met the inclusion criteria during our systematic review. Our searches identified 6 case reports of human papillomavirus (HPV)-related condyloma and squamous cell carcinoma of the neovagina.<sup>4-9</sup> Other case reports include the case of a transgender woman with anogenital lichen sclerosus<sup>10</sup> and the case of a transgender woman with unique cutaneous manifestations of secondary syphilis.<sup>11</sup>

A total of 27 articles explore dermatologic treatment in transgender individuals.<sup>2,12-37</sup> Of these articles, 4 are general overviews of a dermatologist's role in the transition process of transgender patients.<sup>12-15</sup> In all, 11 of the articles discuss the effects of hormones on the skin of transgender individuals, including causing acne and hair disorders.<sup>16-26</sup> There are also 6 articles on illicit filler use in the transgender population and treatment options for dermatologists.<sup>27-32</sup> Two of the publications pertain to chest binding.<sup>33,34</sup>

We identified 29 epidemiologic studies.<sup>38-65</sup> The largest number of these studies examine the prevalence and risk factors of HIV in the transgender community. Five epidemiologic articles address HPV prevention and screening the transgender community.<sup>38-42</sup> Three articles explore the overlapping risk factors of HIV and HPV.<sup>43-45</sup> Of the 29 aforementioned articles, only 1 epidemiologic study is published in a dedicated journal of dermatology.<sup>46</sup>

Overall, we uncovered 6 studies relating to ethical issues,<sup>66-71</sup> 4 of which examined the iPLEDGE program for prescribing isotretinoin.<sup>66-69</sup> Another article discussed the ethics of treating adolescent transgender individuals with reversible gender-affirming procedures.<sup>70</sup>

The largest group of studies in our search describe gender-reaffirming surgical techniques. A total of 35 surgical articles were identified.<sup>72-106</sup> The majority of these articles are published in journals of plastic surgery and urology. They include evaluation of surgical techniques for both neovaginal and neophallic construction and their complications. Articles

also include research on masculinizing mastectomies for transgender men. Three articles discussed facial feminization surgery.<sup>72,73</sup>

Several studies examine the microbiology and cytology of the neovagina.<sup>107-109</sup>

Three of the articles reviewed did not fit into a strict category.<sup>110-112</sup>

## CAPSULE SUMMARY

- There is limited literature on the treatment of transgender patients relevant to dermatology. This systematic review brings together the available literature.
- We aim to show dermatologists how to best provide routine dermatologic care, treat complications of common diseases, and provide safe and noninvasive treatment options for transgender patients.

## DISCUSSION

We have summarized and discussed the current topics in transgender dermatology to improve care for transgender patients.

### Rapport, cultural competence, and humility

For dermatologists to provide transgender patients with excellent care, practices must be inclusive and compassionate. Making assumptions regarding gender

identity, choice of pronoun, or sexual orientation can damage rapport between a practitioner and a transgender patient. Allowing patients to indicate their gender, preferred pronouns, and preferred names on intake forms is an inclusive approach.<sup>13,14</sup> Dermatologists should take a nonjudgmental sexual history. Although rates of sexually transmitted infections such as HIV and HPV are higher among transgender women than among the general population,<sup>35,36</sup> entering a patient encounter with these assumptions can damage rapport. The US Centers for Disease Control and Prevention recommends that providers screen for asymptomatic sexually transmitted infections on the basis of the patient's behavior and sexual practices and not on the basis of transgender identity alone.<sup>35</sup> Additionally, dermatologists should avoid assumptions regarding sexual orientation; transgender individuals may identify as heterosexual, homosexual, bisexual, or queer. Examples of how to best ask about sexual preferences include asking questions such as "Do you have sex with men, women, or both?" in a pragmatic tone to convey that the information will be used solely for patient care.<sup>36</sup> Providers should also avoid assumptions about a patient's desires with regard to hormonal treatments and gender-affirming surgical procedures; not all transgender individuals desire these treatments.<sup>14</sup> Additional best practice guidelines in cultural competency can be viewed in Table II. Educating physicians early on in their training is the best way to ensure that practitioners are

*Abbreviations used:*

FDA: US Food and Drug Administration  
HPV: human papillomavirus

comfortable with and aware of the needs of their transgender patients. However, a recent cross-sectional study of the American Academy of Dermatology's online Basic Dermatology Curriculum showed a near absence of lesbian, gay, bisexual, and transgender-related content.<sup>2</sup> The article "Cultural Humility in the Care of Individuals Who Are Lesbian, Gay, Bisexual, Transgender, or Queer" is a good place to start for providers looking to make their practice more inclusive or learn concepts and terms used to describe sexual orientation.<sup>113</sup>

**Dermatologists' role in gender transition**

The dermatologist can be instrumental in both gender transition and management of adverse effects of affirmation-related therapies.

A cross-sectional study to assess attitudes of the transgender community found that transgender women preferred to change their face before their chest or genitalia.<sup>13</sup> Surgical procedures for facial feminization are the most common; however, some patients avoid permanent surgical procedures because of cost and/or invasiveness or until after the full effects of hormonal therapy are realized—a process that may take more than 2 years.<sup>13,14</sup> The Endocrine Society suggests surgical intervention only after individuals are satisfied with the effect of the hormonal therapy and have achieved appropriate social role change.<sup>114</sup> Dermatologists can provide noninvasive options for facial affirmation, such as neurotoxin injections, cosmetic filler injections, and laser hair removal.<sup>13,14</sup> In the past, many transgender women have pursued these treatments from illicit sources. Dermatologists should provide safe access to gender affirmation therapies and manage complications of illicit filler injection.<sup>14</sup> Dermatologists may also be called on for hair reduction of a donor site before vaginoplasty or phalloplasty surgery.

Gender-affirming surgical procedures may cause undesirable scarring requiring scar revision. The forearm donor site, which is commonly used in phalloplasty, is particularly prone to scarring.<sup>15</sup> Transgender men who undergo mastectomy often have distinct scarring that may cause distress and social stigma.<sup>14</sup> Other scar-related complications such as keloids may develop after these procedures and may benefit from dermatologic intervention.<sup>12</sup>

**Effects of hormonal therapy on skin and hair: Acne**

Hormonal treatments during the transition process for transgender patients affect skin health. For example, estrogen and antiandrogen therapy decrease sebum production and predispose transgender women to xerosis, asteatotic dermatitis, and brittle nails.<sup>14,15</sup> Transgender women undergoing estrogen and antiandrogen therapy may see relative improvement in acne.<sup>23</sup> Conversely, transgender men taking androgen therapy typically experience an increase in severity of acne on the face and back. Androgen-induced acne in these patients typically peaks at 6 months of treatment and begins to subside after the first year.<sup>22,23</sup> Severe scarring acne in these patients may require isotretinoin therapy.<sup>16</sup> Adolescent transgender men who already have moderate-to-severe acne are at highest risk of worsening acne that necessitates isotretinoin.<sup>17</sup> Testosterone therapy may predispose patients to hepatotoxicity, and liver enzymes may require closer monitoring in these patients.<sup>17</sup> Other therapies commonly used to treat dermatologic complications of hyperandrogenism, such as oral contraceptive pills and spironolactone, may counter the desired masculinizing effects of testosterone and are not recommended in these men.<sup>15</sup>

**Effects of hormonal therapy on skin and hair: Hair**

Changes in hair patterns are among the intended therapeutic outcomes of hormone administration for transgender patients.

Transgender women taking estrogen and antiandrogen therapy experience decreased terminal hair growth rate and density.<sup>23</sup> However, many women are not satisfied with the facial hair reduction from hormonal therapy alone and may require additional measures to remove hair growth.<sup>13</sup> The efficacy of hair removal options in this patient population have not been rigorously examined; however, dermatologists should be aware of the various techniques to discuss in detail different options for hair removal.<sup>15</sup> University of California San Francisco guidelines on the care of transgender and nonbinary people suggest that women may seek hair removal on the face and neck or on the genital area in preparation for vaginoplasty.<sup>115</sup> Men may also seek hair permanent hair removal from future graft sites before phalloplasty.<sup>115</sup> Notably, permanent hair removal from donor sites is required before vaginoplasty to prevent hair growth in the neovagina that can form keratin granulomas.<sup>14</sup> Laser hair removal is a US Food and Drug Administration (FDA)-approved treatment for the permanent reduction of hair growth

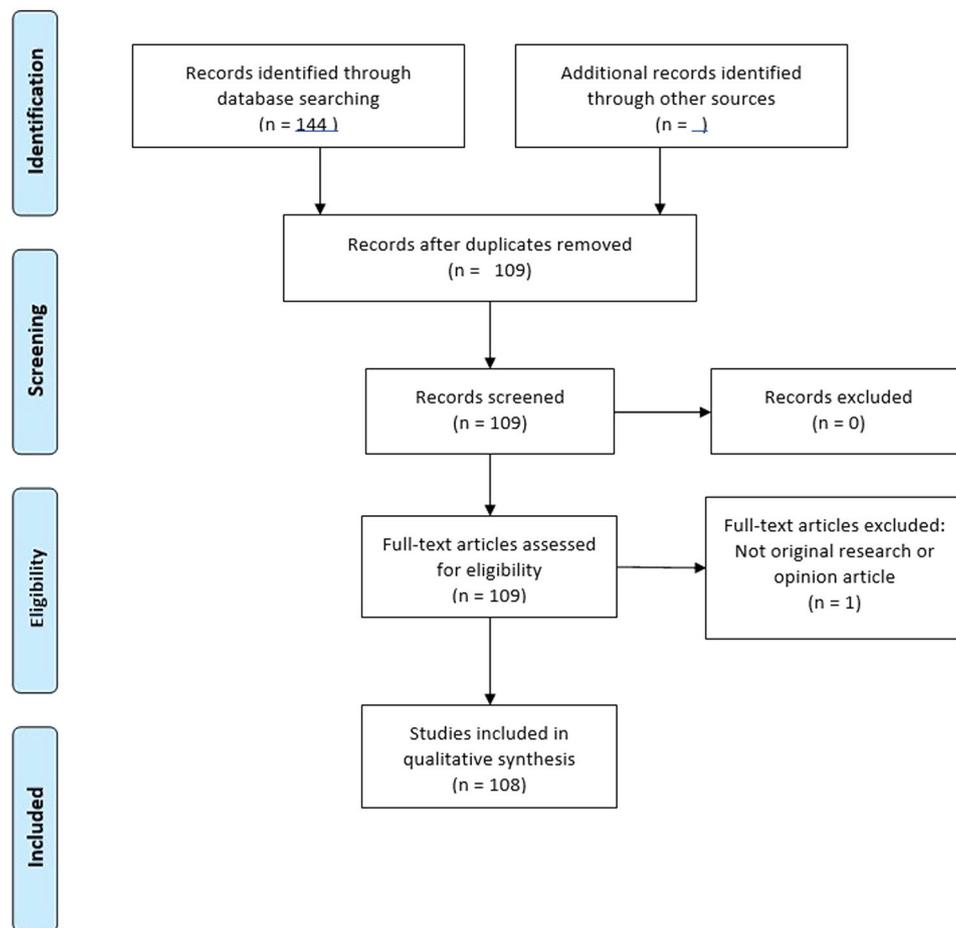
**Table I.** Definitions and terms<sup>116</sup>

Term	Definition
Assigned sex at birth (noun)	The sex (male or female) assigned to a child at birth, most often based on the child's external anatomy. Also referred to as birth sex, natal sex, biological sex, or sex
Binding (noun)	The process of tightly wrapping one's chest to minimize the appearance of having breasts. This is achieved through use of constrictive materials such as cloth strips, elastic or nonelastic bandages, or specially designed undergarments
Bottom surgery (noun)	Colloquial way of describing gender-affirming genital surgery
Cisgender (adj.)	A person whose gender identity and assigned sex at birth correspond (ie, a person who is not transgender)
Gender-affirming hormone therapy (noun)	The administration of hormones for those who wish to match their physical secondary sex characteristics to their gender identity. Also referred to as cross-sex hormone therapy
Gender dysphoria (noun)	Distress experienced by some individuals whose gender identity does not correspond with their assigned sex at birth. Is manifested as clinically significant distress or impairment in social, occupational, or other important areas of functioning. <i>The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition</i> , includes gender dysphoria as a diagnosis
Gender fluid (adj.)	Describes a person whose gender identity is not fixed. A person who is gender-fluid may always feel like a mix of the 2 traditional genders but may feel that he or she is more of 1 gender some of the time and the other gender at other times
Gender identity (noun)	A person's inner sense of being a boy/man/male, girl/woman/female, of another gender, or of no gender
Gender-nonconforming (adj.)	Describes a gender expression that differs from a given society's norms for males and females
Pronouns that you use (noun)	Pronouns are the words that people should use when they are referring to you but not using your name. Examples of pronouns are she/her/hers, he/him/his, and they/them/theirs.
Top surgery (noun)	Colloquial way of describing gender-affirming surgery on the chest
Trans man/transgender man/female-to-male (noun)	Transgender persons whose gender identity is male may use these terms to describe themselves. Some will just use the term <i>man</i>
Trans woman/transgender woman/male-to-female (noun)	Transgender persons whose gender identity is female may use these terms to describe themselves. Some will just use the term <i>woman</i>
Transgender (adj)	Describes a person whose gender identity and assigned sex at birth do not correspond. Also used as an umbrella term to include gender identities outside of male and female. Sometimes abbreviated as trans
Transition (noun)	For transgender people, this refers to the process of coming to recognize, accept, and express one's gender identity. Most often, this refers to the period when a person makes social, legal, and/or medical changes, such as changing his or her clothing, name, and/or sex designation and using medical interventions. Sometimes referred to as gender affirmation process

and Electrolysis is FDA-approved for permanent hair removal.<sup>115</sup> Electrolysis targets the roots of individual hairs and is time-consuming and costly, but it may be a good option for treatment on areas that do not respond to laser hair removal.<sup>115</sup>

Testosterone administration increases body and facial hair growth in nearly all transgender men, though the degree of facial hair is variable and many facial terminal hairs are initially of low caliber.<sup>23</sup> Androgenic alopecia is a common adverse effect from androgen therapy, though some transgender

men find it to be a desirable gender-affirming trait.<sup>19</sup> Transgender individuals with a family history of androgenic alopecia are at higher risk of developing this condition during long-term testosterone therapy.<sup>19</sup> A cross-sectional study of transgender men receiving androgen therapy for an average of 10 years showed that 32.7% of participants had mild frontotemporal hair loss and 31% developed moderate-to-severe pattern alopecia.<sup>22</sup> One study found satisfactory hair growth with 1 mg of daily finasteride in the treatment of transgender men for



**Fig 1.** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2009 flow diagram. (Reprinted from Moher et al.<sup>3</sup>)

**Table II.** Best practice guidelines in cultural competencies

**Best practice guidelines**

Avoid assumptions: each patient has individual vocabulary choices, sexual orientation, and medical goals.

Intake forms should allow patients to indicate their preferred pronoun and gender.

Gender-neutral bathrooms should be available for patients.

Office staff, nurses, physicians, and all other staff should be educated on using inclusive language and creating a safe environment.

Always take a thorough sexual history. Though HIV and other STIs occur in higher rates in the transgender population, it is inappropriate to assume that a patient is at high risk on the basis of gender alone.

Dermatologists can provide safe access to gender-affirming therapies and also play an important role in treating complications of hormonal and surgical treatment.

STI, Sexually transmitted infection.

androgenic alopecia without decreasing virilization.<sup>19</sup> Otherwise, we did not encounter research into treatment options for androgenic alopecia associated with testosterone administration.

**Complications of illicit fillers**

There are several case reports that describe serious health complications due to illicit filler use

for body augmentation and gender affirmation in transgender patients.<sup>27-32</sup> For transgender women, illicit silicone injections have been utilized as a less expensive alternative to plastic surgery for feminization of the buttocks, hips, breasts, face, and calves.<sup>30,31</sup> Higher historical HIV prevalence in the transgender community than in the general population may be another risk factor for illicit filler

injections because of high rates of HIV-associated lipoatrophy.<sup>27</sup> One study performed in the United States found the prevalence of illicit filler use in transgender women to be 16.7%, with one-fifth of these patients reporting complications.<sup>31</sup> Improper injection of illicit and nonmedical filler may cause silicone granulomas, which may ulcerate and cause significant pain and disfigurement.<sup>27-29,32</sup> Intralesional or systemic steroids can be used to decrease initial inflammation but may cause delayed wound healing or worsening of bacterial biofilm formation.<sup>29,32</sup> Other medical options include tetracycline antibiotics, imiquimod, etanercept, tacrolimus, and allopurinol.<sup>28,32</sup> Ulceration from a silicone reaction may improve with application of a collagenase with hyaluronic acid.<sup>29</sup> Surgical excision of affected skin can be effective; however, recurrence due to subclinical filler migration has been reported. In general, we recommend medical therapy of silicone granulomas, with surgical excision best reserved for patients who have failed medical management and/or have localized disease.<sup>29,32</sup>

### Diagnostic challenges

Diagnosis of HPV-related dermatoses of the neovagina in transgender women may be challenging.<sup>4-9</sup> Transgender patients who have undergone gender-affirming surgical procedures are also more prone to squamous cell carcinoma of the neogenitalia on account of chronic inflammation, fistula formation, and scarring.<sup>7</sup> Long-term follow-up, including internal genitalia examination, is warranted in patients with a history of anogenital warts who undergo vaginoplasty.<sup>14</sup> Dermatologists must also be aware of cisgender-predominant diagnoses that may appear in transgender patients, such as lichen sclerosus.<sup>10</sup> At this time there is insufficient evidence to recommend screening high-risk patients for anal dysplasia via anal cytology or routine anoscopy. Transgender individuals who engage in high-risk sexual behavior should be vaccinated against HPV up through the age of 26 years.<sup>35</sup> Dermatologists should examine the anogenital area of all patients with a history of anogenital warts, and atypical lesions should be examined by biopsy.

### Ethical issues

The treatment of severe acne in transgender men with isotretinoin is a controversial topic. iPLEDGE is an FDA-mandated program with the goal of reducing fetal exposure to isotretinoin.<sup>66</sup> At the time of this publication, only 3 categories of patients can be registered to the iPledge program: male patients, female patients of nonreproductive potential, and female patients of reproductive potential.

Transgender men can maintain reproductive potential but do not fit in any of these gender categories.<sup>16</sup> Some transgender men may become pregnant despite testosterone therapy.<sup>67</sup> As such, regular counseling and pregnancy testing during isotretinoin therapy is prudent for transgender men who maintain reproductive potential. Unfortunately, transgender men who maintain reproductive potential are currently required to register to the iPLEDGE program as females. This can alienate patients from dermatologic care and decrease the likelihood that a patient will receive isotretinoin.<sup>66</sup> A new gender-neutral inclusive category within iPLEDGE is necessary. Simple designation of *patients able to become pregnant* or *patients unable to get pregnant* would demonstrate inclusion of transgender patients. Until iPLEDGE embraces more inclusive options for our transgender patients, we recommend that dermatologists continue to enroll transgender women as females of nonreproductive potential and transgender men who have not undergone hysterectomy/oophorectomy as females of reproductive potential.

Gender dysphoria is often apparent in patients before adulthood. Dermatologists who see adolescent patients with persistent gender dysphoria may ethically perform reversible and noninvasive gender-affirming treatments after evaluation by a qualified mental health professional.<sup>70</sup>

### Areas for increased research

Transgender dermatology is a relatively new area of research, and despite a solid foundation, specific knowledge gaps remain. We would like to highlight the areas for research that would most greatly benefit the care of our transgender patients.

On a population level, epidemiologic studies of transgender patients and their dermatologic needs should be conducted on a more intentional basis. Ongoing research is needed to find and evaluate screening techniques for anal cancer in high-risk patients, particularly as population-wide risk factors change over time.

Dermatologists should investigate long-term outcomes of acne treatments in transgender male patients to better understand whether standard therapies are effective in this population.<sup>14</sup> Treatment options for androgenic alopecia associated with testosterone administration should be explored and standardized, including whether 5 $\alpha$ -reductase inhibitors can be used, at what point during testosterone therapy they can be initiated without counteracting desired masculinizing effects, and at what dosage they should be used in this population. Also warranted are studies comparing

the effectiveness of hair removal techniques for transgender females and determining whether these techniques are most effective before or after initiation of hormonal therapies. Options for hair removal from donor sites before neogenitalia construction surgery should be explored to best reduce associated complications, including keratin granulomas. Reports of dermatologic complications of neogenitalia surgery in male transgender individuals are under-represented relative to reports of complications in female transgender patients. A more standardized, objective method for evaluating the differences between facial features of males and females are needed both to plan noninvasive and surgical treatments in these patients and also evaluate outcomes.<sup>72</sup> Studies should continue to investigate dermatologic sequelae from genital and chest surgery.

Additionally, it is crucial to describe barriers to accessing dermatologic care that transgender patients may have, including socioeconomic, structural, and perceived social barriers. More research and education is needed to focus on ways in which dermatologists can build a rapport with transgender patients to best meet their needs and provide excellent care.

### Limitations

In retrospect, additional search terms, such as *hair*, *hair removal*, *illicit fillers*, and *alopecia*, could have been included, as these are common issues that dermatologists may be involved in treating.

### CONCLUSIONS

Dermatologists have the ability to improve the care of transgender patients by providing specialized dermatologic care and providing safe and noninvasive treatment options for transitioning patients. Here we have reviewed the literature and highlighted opportunities to expand our knowledge of how to best care for our transgender patients.

### REFERENCES

- Gates GJ. How many people are lesbian, gay, bisexual, and transgender? Los Angeles, CA: Williams Institute; 2011. Available at: <http://williamsinstitute.law.ucla.edu/wp-content/uploads/Gates-How-Many-People-LGBT-Apr-2011.pdf>. Accessed July 11, 2018.
- Park AJ, Katz KA. Paucity of lesbian, gay, bisexual, and transgender health-related content in the basic dermatology curriculum. *JAMA Dermatol*. 2018;154(5):614-615.
- Moher D, Liberati A, Tetzlaff J, Altman DG, PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6(7):e1000097.
- Yang C, Liu S, Xu K, Xiang Q, Yang S, Zhang X. Condylomata gigantea in a male transsexual. *Int J STD AIDS*. 2009;20(3):211-212.
- Bollo J, Balla A, Rodriguez Luppi C, Martinez C, Quaresima S, Targarona EM. HPV-related squamous cell carcinoma in a neovagina after male-to-female gender confirmation surgery. *Int J STD AIDS*. 2018;29(3):306-308.
- Wasef W, Sugunendran H, Alawattegama A. Genital warts in a transsexual. *Int J STD AIDS*. 2005;16(5):388-389.
- Harder Y, Erni D, Banic A. Squamous cell carcinoma of the penile skin in a neovagina 20 years after male-to-female reassignment. *Br J Plast Surg*. 2002;55(5):449-451.
- Liguori G, Trombetta C, Bucci S, et al. Condylomata acuminata of the neovagina in a HIV-seropositive male-to-female transsexual. *Urol Int*. 2004;73(1):87-88.
- Fernandes HM, Manolitsas TP, Jobling TW. Carcinoma of the neovagina after male-to-female reassignment. *J Low Genit Tract Dis*. 2014;18(2):E43-E45.
- McMurray SL, Overholser E, Patel T. A transgender woman with anogenital lichen sclerosis. *JAMA Dermatol*. 2017;153(12):1334-1335.
- Navrazhina K, Cressey BD, Minkis K. Papulonodular secondary syphilis presenting as multiple distinct cutaneous lesions in an HIV-positive transgender woman. *Case Rep Dermatol*. 2017;9(1):90-94.
- Katz KA, Furnish TJ. Dermatology-related epidemiologic and clinical concerns of men who have sex with men, women who have sex with women, and transgender individuals. *Arch Dermatol*. 2005;141(10):1303-1310.
- Ginsberg BA, Calderon M, Seminara NM, Day D. A potential role for the dermatologist in the physical transformation of transgender people: a survey of attitudes and practices within the transgender community. *J Am Acad Dermatol*. 2016;74(2):303-308.
- Ginsberg BA. Dermatologic care of the transgender patient. *Int J Womens Dermatol*. 2016;3(1):65-67.
- Hermosura Almazan T, Kabigting FD. Dermatologic care of the transgender patient. *Dermatol Online J*. 2016;22(10). pii: 13030/qt01j5z8ps. D: 28329583 [Indexed for MEDLINE].
- Turrión-Merino L, Urech-García-de-la-Vega M, Miguel-Gomez L, Harto-Castaño A, Jaen-Olasolo P. Severe acne in female-to-male transgender patients. *JAMA Dermatol*. 2015;151(11):1260-1261.
- Campos-Muñoz L, López-De Lara D, Rodríguez-Rojo ML, Conde-Taboada A, López-Bran E. Transgender adolescents and acne: a cases series. *Pediatr Dermatol*. 2018;35(3):e155-e158.
- Gao Y, Maurer T, Mirmirani P. Understanding and addressing hair disorders in transgender individuals. *Am J Clin Dermatol*. 2018;19(4):517-527.
- Moreno-Arrones OM, Becerra A, Vano-Galvan S. Therapeutic experience with oral finasteride for androgenetic alopecia in female-to-male transgender patients. *Clin Exp Dermatol*. 2017;42(7):743-748.
- Karppinen A. [Article in Finnish] [Reduction of hairiness of a transsexual person]. *Duodecim*. 2015;131(4):396-398.
- Kelly Y, Blanco A, Tosti A. Androgenetic alopecia: an update of treatment options. *Drugs*. 2016;76(14):1349-1364.
- Wierckx K, Van de Peer F, Verhaeghe E, et al. Short- and long-term clinical skin effects of testosterone treatment in trans men. *J Sex Med*. 2014;11(1):222-229.
- Giltay EJ, Gooren LJ. Effects of sex steroid deprivation/administration on hair growth and skin sebum production in transsexual males and females. *J Clin Endocrinol Metab*. 2000;85(8):2913-2921.

24. Irwig MS. Testosterone therapy for transgender men. *Lancet Diabetes Endocrinol.* 2017;5(4):301-311.
25. Untersmayr E, Jensen AN, Walch K. Sex hormone allergy: clinical aspects, causes and therapeutic strategies - update and secondary publication. *World Allergy Organ J.* 2017;10(1):45.
26. Schneider F, Neuhaus N, Wistuba J, et al. Testicular functions and clinical characterization of patients with gender dysphoria (GD) undergoing sex reassignment surgery (SRS). *J Sex Med.* 2015;12(11):2190-2200.
27. Seward AC, Meara DJ. Industrial-grade silicone injections causing intermittent bilateral malar swelling: review of safety and efficacy of techniques and products available. *J Oral Maxillofac Surg.* 2013;71(7):1245-1248.
28. Rothman LR, Kim RH, Meehan SA, Femia A. Silicone granulomas with ulcers. *Dermatol Online J.* 2016;22(12). pii: 13030/qt1gc7400w. D: 28329542 [Indexed for MEDLINE].
29. Carella S, Romanzi A, Ciotti M, Onesti MG. Skin ulcer: a long-term complication after massive liquid silicone oil infiltration. *Aesthetic Plast Surg.* 2013;37(6):1220-1224.
30. Hage JJ, Kanhai RC, Oen AL, van Diest PJ, Karim RB. The devastating outcome of massive subcutaneous injection of highly viscous fluids in male-to-female transsexuals. *Plast Reconstr Surg.* 2001;107(3):734-741.
31. Wilson E, Rapues J, Jin H, Raymond HF. The use and correlates of illicit silicone or "fillers" in a population-based sample of transwomen, San Francisco, 2013. *J Sex Med.* 2014;11(7):1717-1724.
32. Styperek A, Bayers S, Beer M, Beer K. Nonmedical-grade injections of permanent fillers: medical and medicolegal considerations. *J Clin Aesthet Dermatol.* 2013;6(4):22-29.
33. Peitzmeier S, Gardner I, Weinand J, Corbet A, Acevedo K. Health impact of chest binding among transgender adults: a community-engaged, cross-sectional study. *Cult Health Sex.* 2017;19(1):64-75.
34. Feldman J, Goldberg J. Transgender primary medical care: suggested guidelines for clinicians in British Columbia. Available at: [http://lgbtqpn.ca/wpcontent/uploads/woocommerce\\_uploads/2014/08/Guidelines-primarycare.pdf](http://lgbtqpn.ca/wpcontent/uploads/woocommerce_uploads/2014/08/Guidelines-primarycare.pdf); 2006. Accessed June 20, 2018.
35. Workowski KA, Bolan GA, Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recomm Rep.* 2015;64(RR-03):1-137.
36. Charny JW, Kovarik CL. LGBT access to health care: a dermatologist's role in building a therapeutic relationship. *Cutis.* 2017;99(4):228-229.
37. Chipkin SR, Kim F. Ten most important things to know about caring for transgender patients. *Am J Med.* 2017;130(11):1238-1245.
38. Nureña CR, Brown B, Galea JT, Sánchez H, Blas MM. HPV and genital warts among Peruvian men who have sex with men and transgender people: knowledge, attitudes and treatment experiences. *PLoS One.* 2013;8(3):e58684.
39. Nadarzynski T, Smith H, Richardson D, Pollard A, Llewellyn C. Perceptions of HPV and attitudes towards HPV vaccination amongst men who have sex with men: a qualitative analysis. *Br J Health Psychol.* 2017;22(2):345-361.
40. Ruanpeng D, Chariyalertsak S, Kaewpoowat Q, et al. Cytological anal squamous intraepithelial lesions associated with anal high-risk human papillomavirus infections among men who have sex with men in northern Thailand. *PLoS One.* 2016;11(5):e0156280.
41. Arora R, Pandhi D, Mishra K, Bhattacharya SN, Yhome VA. Anal cytology and p16 immunostaining for screening anal intraepithelial neoplasia in HIV-positive and HIV-negative men who have sex with men: a cross-sectional study. *Int J STD AIDS.* 2014;25(10):726-733.
42. Brown B, Monsour E, Klausner JD, Galea JT. Sociodemographic and behavioral correlates of anogenital warts and human papillomavirus-related knowledge among men who have sex with men and transwomen in Lima, Peru. *Sex Transm Dis.* 2015;42(4):198-201.
43. Brown B, Davtyan M, Leon SR, et al. A prospective cohort study characterising the role of anogenital warts in HIV acquisition among men who have sex with men: a study protocol. *BMJ Open.* 2014;4(9):e005687.
44. Galea JT, Kinsler JJ, Galan DB, et al. Factors associated with visible anogenital warts among HIV-uninfected Peruvian men who have sex with men and transwomen: a cross-sectional study. *Sex Transm Dis.* 2015;42(4):202-207.
45. Brown B, Galea JT, Byraiah G, et al. Anogenital human papillomavirus infection and HIV infection outcomes among Peruvian transgender women: results from a cohort study. *Transgend Health.* 2016;1(1):94-98.
46. Shinde S, Setia MS, Row-Kavi A, Anand V, Jerajani H. Male sex workers: are we ignoring a risk group in Mumbai, India. *Indian J Dermatol Venereol Leprol.* 2009;75(1):41-46.
47. Tang W, Han L, Best J, et al. Crowdsourcing HIV test promotion videos: a noninferiority randomized controlled trial in China. *Clin Infect Dis.* 2016;62(11):1436-1442.
48. Vun MC, Fujita M, Rathavy T, et al. Achieving universal access and moving towards elimination of new HIV infections in Cambodia. *J Int AIDS Soc.* 2014;17:18905.
49. Avila MM, Dos Ramos Farías MS, Fazzi L, et al. High frequency of illegal drug use influences condom use among female transgender sex workers in Argentina: impact on HIV and syphilis infections. *AIDS Behav.* 2017;21(7):2059-2068.
50. Dasarathan S, Kalaivani S. Study of prevalence of sexually transmitted infections/human immunodeficiency virus and condom use among male-to-female transgender: a retrospective analysis from a tertiary care hospital in Chennai. *Indian J Sex Transm Dis AIDS.* 2017;38(1):43-46.
51. Best J, Tang W, Zhang Y, et al. Sexual behaviors and HIV/syphilis testing among transgender individuals in China: implications for expanding HIV testing services. *Sex Transm Dis.* 2015;42(5):281-285.
52. Chhim S, Ngin C, Chhoun P, et al. HIV prevalence and factors associated with HIV infection among transgender women in Cambodia: results from a national integrated biological and behavioral survey. *BMJ Open.* 2017;7(8):e015390.
53. Weissman A, Ngak S, Srean C, Sansothy N, Mills S, Ferradini L. HIV Prevalence and risks associated with HIV infection among transgender individuals in Cambodia. *PLoS One.* 2016;11(4):e0152906.
54. Castro R, Ribeiro-Alves M, Corrêa RG, et al. The men who have sex with men HIV Care Cascade in Rio de Janeiro, Brazil. *PLoS One.* 2016;11(6):e0157309.
55. Tang S, Tang W, Meyers K, Chan P, Chen Z, Tucker JD. HIV epidemiology and responses among men who have sex with men and transgender individuals in China: a scoping review. *BMC Infect Dis.* 2016;16(1):588.
56. Sahastrabuddhe S, Gupta A, Stuart E, et al. Sexually transmitted infections and risk behaviors among transgender persons (Hijras) of Pune, India. *J Acquir Immune Defic Syndr.* 2012;59(1):72-78.
57. Yi S, Ngin C, Tuot S, et al. HIV prevalence, risky behaviors, and discrimination experiences among transgender women in Cambodia: descriptive findings from a national integrated

- biological and behavioral survey. *BMC Int Health Hum Rights*. 2017;17(1):14.
58. Hoorneborg E, Achterbergh RC, van der Loeff MFS, et al. Men who have sex with men more often chose daily than event-driven use of pre-exposure prophylaxis: baseline analysis of a demonstration study in Amsterdam. *J Int AIDS Soc*. 2018;21(3):e25105.
  59. Liu C, Mao J, Wong T, et al. Comparing the effectiveness of a crowdsourced video and a social marketing video in promoting condom use among Chinese men who have sex with men: a study protocol. *BMJ Open*. 2016;6(10):e010755.
  60. Idrus NI, Hymans TD. Balancing benefits and harm: chemical use and bodily transformation among Indonesia's transgender waria. *Int J Drug Policy*. 2014;25(4):789-797.
  61. Zhao P, Tang S, Wang C, et al. Recreational drug use among Chinese MSM and transgender individuals: results from a national online cross-sectional study. *PLoS One*. 2017;12(1):e0170024.
  62. Zhang Y, Best J, Tang W, et al. Transgender sexual health in China: a cross-sectional online survey in China. *Sex Transm Infect*. 2016;92(7):515-519.
  63. Muñoz-Laboy M, Severson N. Exploring the roles of race, ethnicity, nationality, and skin color in the sexual partner choices of bisexual Latino men. *Arch Sex Behav*. 2018;47(4):1231-1239.
  64. Edmiston EK, Donald CA, Sattler AR, Peebles JK, Ehrenfeld JM, Eckstrand KL. Opportunities and gaps in primary care preventative health services for transgender patients: a systemic review. *Transgend Health*. 2016;1(1):216-230.
  65. Hounsfield VL, Freedman E, McNulty A, Bourne C. Transgender people attending a Sydney sexual health service over a 16-year period. *Sex Health*. 2007;4(3):189-193.
  66. Katz KA. Transgender patients, isotretinoin, and US Food and Drug Administration-mandated risk evaluation and mitigation strategies: a prescription for inclusion. *JAMA Dermatol*. 2016;152(5):513-514.
  67. Yeung H, Chen SC, Katz KA, Stoff BK. Prescribing isotretinoin in the United States for transgender individuals: ethical considerations. *J Am Acad Dermatol*. 2016;75(3):648-651.
  68. Mundluru SN, Safer JD, Larson AR. Unforeseen ethical challenges for isotretinoin treatment in transgender patients. *Int J Womens Dermatol*. 2016;2(2):46-48.
  69. Rieder EA, Nagler AR, Leger MC. In response to Ginsberg et al: "A potential role for the dermatologist in the physical transformation of transgender people: a survey of attitudes and practices within the transgender community". *J Am Acad Dermatol*. 2016;75(2):e73.
  70. Waldman RA, Waldman SD, Grant-Kels JM. The ethics of performing non-invasive, reversible gender affirming procedures on transgender adolescents. *J Am Acad Dermatol*. 2017;79(6):1166-1168.
  71. Stephens MM, Cook-Fasano HT, Sibbaluca K. Childhood bullying: implications for physicians. *Am Fam Physician*. 2018;97(3):187-192.
  72. Becking AG, Tuinzing DB, Hage JJ, Gooren LJ. Transgender feminization of the facial skeleton. *Clin Plast Surg*. 2007;34(3):557-564.
  73. Altman K. Facial feminization surgery: current state of the art. *Int J Oral Maxillofac Surg*. 2012;41(8):885-894.
  74. Cherubino M, Berli J, Turri-zanoni M, et al. Sandwich fascial anterolateral thigh flap in head and neck reconstruction: evolution or revolution? *Plast Reconstr Surg Glob Open*. 2017;5(1):e1197.
  75. Van der Sluis WB, Bouman MB, Buncamper ME, Mullender MG, Meijerink WJ. Revision vaginoplasty: a comparison of surgical outcomes of laparoscopic intestinal versus perineal full-thickness skin graft vaginoplasty. *Plast Reconstr Surg*. 2016;138(4):793-800.
  76. Buncamper ME, van der Sluis WB, van der Pas RS, et al. Surgical outcome after penile inversion vaginoplasty: a retrospective study of 475 transgender women. *Plast Reconstr Surg*. 2016;138(5):999-1007.
  77. Cregten-Escobar P, Bouman MB, Buncamper ME, Mullender MG. Subcutaneous mastectomy in female-to-male transsexuals: a retrospective cohort-analysis of 202 patients. *J Sex Med*. 2012;9(12):3148-3153.
  78. Johnsen NV, Voelzke BB. Autologous rectus fascia graft interposition repair of urethrocutaneous fistulae in female-to-male metoidioplasty patients. *Urology*. 2018;116:208-212.
  79. Elmer-DeWitt MA, Wood HM, Hull T, Unger CA. Rectovaginal fistula in a transgender woman successfully repaired using a buccal mucosa graft. *Female Pelvic Med Reconstr Surg*. 2019;25(2):e43-e44.
  80. Kim S, Dennis M, Holland J, Terrell M, Loukas M, Schober J. The anatomy of forearm free flap phalloplasty for transgender surgery. *Clin Anat*. 2018;31(2):145-151.
  81. Rieger UM, Majenka P, Wirthmann A, Sohn M, Bozkurt A, Djedovic G. Comparative study of the free microvascular groin flap: optimizing the donor site after free radial forearm flap phalloplasty. *Urology*. 2016;95:192-196.
  82. Kim S, Dennis M, Holland J, Terrell M, Loukas M, Schober J. The anatomy of abdominal flap phalloplasty for transgender surgery. *Clin Anat*. 2018;31(2):181-186.
  83. Watfa W, di Summa PG, Meuli J, Raffoul W, Bauquis O. MatriDerm decreases donor site morbidity after radial forearm free flap harvest in transgender surgery. *J Sex Med*. 2017;14(10):1277-1284.
  84. Salgado CJ, Nugent AG, Moody AM, Chim H, Paz AM, Chen HC. Immediate pedicled gracilis flap in radial forearm flap phalloplasty for transgender male patients to reduce urinary fistula. *J Plast Reconstr Aesthet Surg*. 2016;69(11):1551-1557.
  85. Gilbert DA, Jordan GH, Devine CJ Jr, Winslow BH. Microsurgical forearm "cricket bat-transformer" phalloplasty. *Plast Reconstr Surg*. 1992;90(4):711-716.
  86. Zaheer U, Granger A, Ortiz A, Terrell M, Loukas M, Schober J. The anatomy of free fibula osteoseptocutaneous flap in neophalloplasty in transgender surgery. *Clin Anat*. 2018;31(2):169-174.
  87. Horbach SE, Bouman MB, Smit JM, Özer M, Buncamper ME, Mullender MG. Outcome of vaginoplasty in male-to-female transsexuals: a systematic review of surgical techniques. *J Sex Med*. 2015;12(6):1499-1512.
  88. Buncamper ME, van der Sluis WB, de Vries M, Witte BI, Bouman MB, Mullender MG. Penile inversion vaginoplasty with or without additional full-thickness skin graft: to graft or not to graft? *Plast Reconstr Surg*. 2017;139(3):649e-656e.
  89. van der Sluis WB, Verweij SP, Özer M, Meijerink WJ, Bouman MB. Total laparoscopic intestinal vaginoplasty as neovaginal reconstruction in an HIV-positive transgender woman. *Int J STD AIDS*. 2016;27(8):684-686.
  90. Slater MW, Vinaja X, Aly I, Loukas M, Terrell M, Schober J. Neovaginal construction with pelvic peritoneum: reviewing an old approach for a new application. *Clin Anat*. 2018;31(2):175-180.
  91. Reed HM, Yanes RE, Delto JC, Omarzai Y, Imperatore K. Non-grafted vaginal depth augmentation for transgender atresia, our experience and survey of related procedures. *Aesthetic Plast Surg*. 2015;39(5):733-744.

92. Buncamper ME, Honselaar JS, Bouman MB, Özer M, Kreukels BP, Mullender MG. Aesthetic and functional outcomes of neovaginoplasty using penile skin in male-to-female transsexuals. *J Sex Med.* 2015;12(7):1626-1634.
93. Selvaggi G. Comment on: Aesthetic and functional outcomes of neovaginoplasty using penile skin in male-to-female transsexuals. *J Sex Med.* 2015;12(7):1635-1636.
94. Bouman MB, Buncamper ME, van der Sluis WB, Meijerink WJ. Total laparoscopic sigmoid vaginoplasty. *Fertil Steril.* 2016;106(7):e22-e23.
95. Seyed-Foroootan K, Karimi H, Seyed-Foroootan NS. Autologous fibroblast-seeded amnion for reconstruction of neo-vagina in male-to-female reassignment surgery. *Aesthetic Plast Surg.* 2018;42(2):491-497.
96. Trombetta Carlo, Liguori Giovanni, Benvenuto Sara, et al. [Neo-urethroclitoroplasty according to Petrovic]. *Urologia.* 2011;78(4):267-273.
97. Colebunders B, Brondeel S, D'Arpa S, Hoebeke P, Monstrey S. An update on the surgical treatment for transgender patients. *Sex Med Rev.* 2017;5(1):103-109.
98. Bizic MR, Stojanovic B, Djordjevic ML. Genital reconstruction for the transgendered individual. *J Pediatr Urol.* 2017;13(5):446-452.
99. Yılmaz T, Kuşçu O, Sözen T, Süslü AE. Anterior glottic web formation for voice feminization: experience of 27 patients. *J Voice.* 2017;31(6):757-762.
100. Spack NP. Management of transgenderism. *JAMA.* 2013;309(5):478-484.
101. Kääriäinen M, Salonen K, Helminen M, Karhunen-Enckell U. Chest-wall contouring surgery in female-to-male transgender patients: a one-center retrospective analysis of applied surgical techniques and results. *Scand J Surg.* 2017;106(1):74-79.
102. Knox ADC, Ho AL, Leung L, et al. A review of 101 consecutive subcutaneous mastectomies and male chest contouring using the concentric circular and free nipple graft techniques in female-to-male transgender patients. *Plast Reconstr Surg.* 2017;139(6):1260e-1272e.
103. van de Grift TC, Elfering L, Bouman MB, Buncamper ME, Mullender MG. Surgical indications and outcomes of mastectomy in transmen: a prospective study of technical and self-reported measures. *Plast Reconstr Surg.* 2017;140(3):415e-424e.
104. Karhunen-Enckell Ulla, Kolehmainen Maija, Kääriäinen Minna, Suominen Sinikka. [Article in Finnish] [Surgery of the breast on transgender persons]. *Duodecim.* 2015;131(4):383-386.
105. McEvenue G, Xu FZ, Cai R, McLean H. Female-to-male gender affirming top surgery: a single surgeon's 15-year retrospective review and treatment algorithm. *Aesthet Surg J.* 2017;38(1):49-57.
106. Trum HW, Hoebeke P, Gooren LJ. Sex reassignment of transsexual people from a gynecologist's and urologist's perspective. *Acta Obstet Gynecol Scand.* 2015;94(6):563-567.
107. Grosse A, Grosse C, Lenggenhager D, Bode B, Camenisch U, Bode P. Cytology of the neovagina in transgender women and individuals with congenital or acquired absence of a natural vagina. *Cytopathology.* 2017;28(3):184-191.
108. Petricevic L, Kaufmann U, Domig KJ, et al. Rectal *Lactobacillus* species and their influence on the vaginal microflora: a model of male-to-female transsexual women. *J Sex Med.* 2014;11(11):2738-2743.
109. Petricevic L, Kaufmann U, Domig KJ, et al. Molecular detection of *Lactobacillus* species in the neovagina of male-to-female transsexual women. *Sci Rep.* 2014;4:3746.
110. Schmidt E, Rizzolo D. Disease screening and prevention for transgender and gender-diverse adults. *JAAPA.* 2017;30(10):11-16.
111. Katz KA, Dick SE, Osterman MT, Junkins-Hopkins JM. Perianal skin tags in a patient with Crohn disease and a subclinical rectal stricture. *Cutis.* 2007;80(5):429-431.
112. Lemos MP, Lama JR, Karuna ST, et al. The inner foreskin of healthy males at risk of HIV infection harbors epithelial CD4<sup>+</sup>CCR5<sup>+</sup> cells and has features of an inflamed epidermal barrier. *PLoS One.* 2014;9(9):e108954.
113. Ruud M. Cultural humility in the care of individuals who are lesbian, gay, bisexual, transgender, or queer. *Nurs Womens Health.* 2018;22(3):255-263.
114. Hembree WC, Cohen-Kettenis PT, Gooren L, et al. Endocrine treatment of gender-dysphoric/gender-incongruent persons: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab.* 2017;102(11):3869-3903. Erratum in: *J Clin Endocrinol Metab.* 2018 Feb 1;103(2):699. *J Clin Endocrinol Metab.* 2018 Jul 1;103(7):2758-2759.
115. Reeves C, Deutsch BM, Stark JW. Guidelines for the primary and gender-affirming care of transgender and gender nonbinary people. center of excellence for transgender health. Available at: <http://transhealth.ucsf.edu/trans?page=guidelines-hair-removal>; 2016. Accessed October 25, 2018.
116. National LGBT Health Education Center. Glossary of LGBT terms for health care teams. Available at: <https://www.lgbthealtheducation.org/wp-content/uploads/2018/03/Glossary-2018-English-update-1.pdf>; 2017. Accessed October 25, 2018.