THE UNIVERSITY OF CHICAGO MEDICINE & BIOLOGICAL SCIENCES

19yo FTM New Patient Visit: Review of Transgender Care in the Endocrinology Setting

I have no relevant financial relationships with any commercial interests.

Isabel Casimiro, MD, PhD

March 2017

HPI

- 19 FTM transgender patient presents to clinic to continue hormone therapy
- Born female at birth but identifies as a male and prefers to use male pronouns
- Started on testosterone at Howard Brown Health in June 2016
- Reports having regular menses prior to hormone therapy initiation
- Participated in “informed consent model” at the onset of hormonal treatment for gender affirmation
- Satisfied with changes undergone since starting testosterone, including cessation of menses, changes in voice and redistribution of body fat

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CHICAGO

MEDICINE

Renew Now

The Endocrine Society in the News

Many Endocrinologists Have Received No Formal Training On How To Care For Transgender Patients, Survey Reveals.

In continuing coverage from yesterday's briefing, the Huffington Post (1/11, Almendrala) reports that according to the findings of a survey of members of the Endocrine Society, many endocrinologists "feel they lack the training they need to feel confident when treating transgender patients."

Medscape (1/11, Frellick) reports, "Nearly 80% of endocrinologists have treated a transgender person, but the same percentage (80.6%) have never received formal training on care for these patients," the findings of a survey published online in the Journal of Clinical Endocrinology & Metabolism reveal. "Starting education about the transgender population in medical school and expanding continuing education through online modules or medical conferences can help ensure professionals are properly prepared," study author Caroline Davidge-Pitts, MD, of the Mayo Clinic in Rochester, MN, and colleagues concluded. In an Endocrine Society press release, Dr. Davidge-Pitts said, "As awareness and insurance coverage of transgender healthcare has increased, there is growing demand for healthcare providers with expertise in this area." Clinical Endocrinology News (1/11, Dotinga) also covers the story.

Transgender Health in Endocrinology: Current Status of Endocrinology Fellowship Programs and Practicing Clinicians

Caroline Davidge-Pitts, M.B.B.Ch.; Todd B. Nippoldt, M.D.; Ann Danoff, M.D.;
Lauren Radziejewski, M.S.N., A.N.P-B.C; Neena Natt, M.D, M.MEd

Journal of Clinical Endocrinology & Metabolism. Published 1/10/2017.

Few Endocrinologists Are Adequately Prepared For Transgender Care

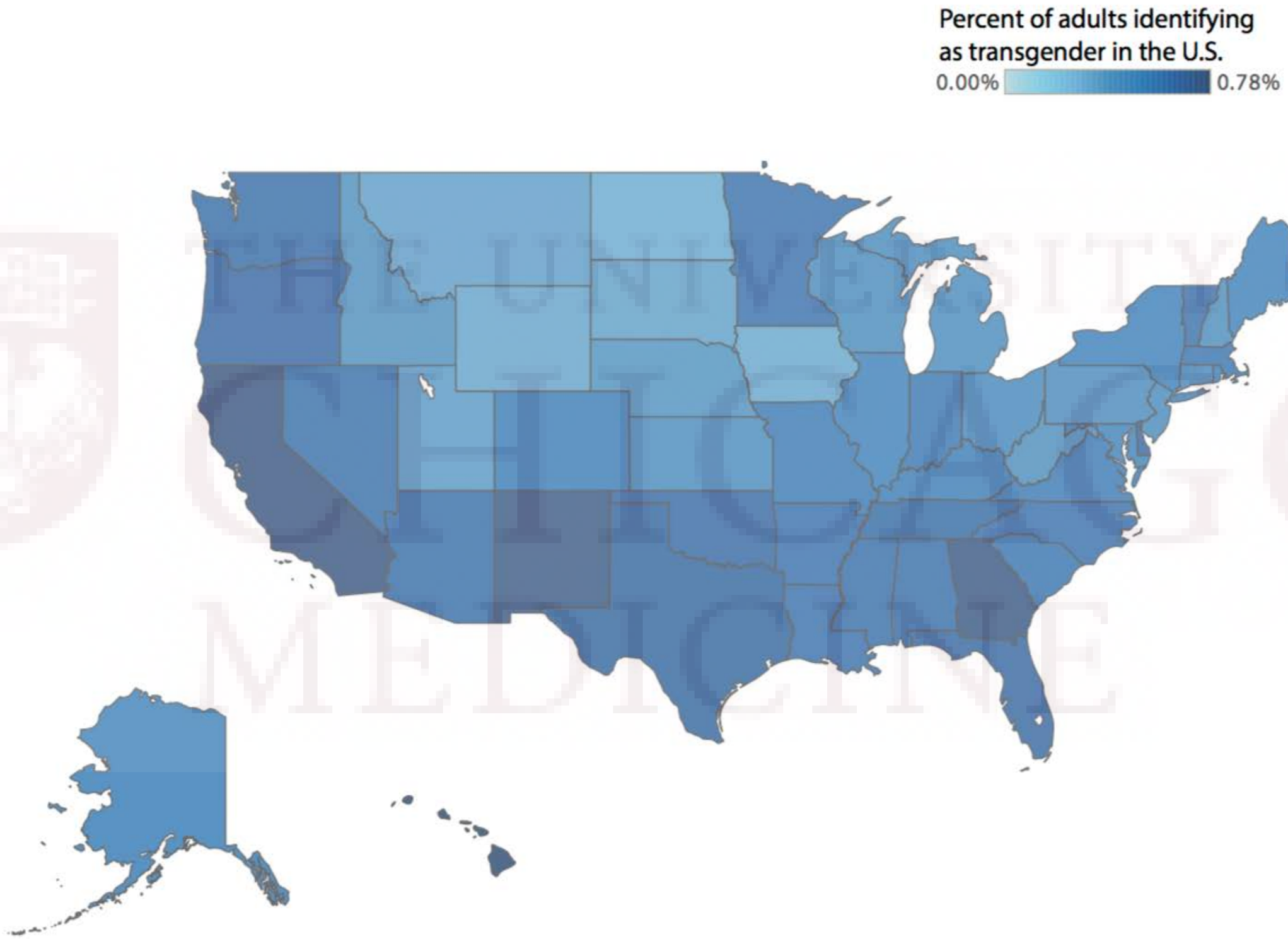
- Anonymous survey sent to 6992 US practicing endocrinologists (8% Peds Endo)
- Nearly 80% of endocrinologists have treated a transgender person; However, 80.6% have never received formal training on care for these patients (out of 411 responders)
- 77% were very or somewhat confident in terms & definitions, 63% in taking a history, & 65% in prescribing hormones
- 35 of 54 Endocrinology Fellowship PDs reported education on transgender topics (64.8%)
- 93.8% of PDs indicated fellowship training in this area is important

Conclusions from this Study

- Confidence and competence in transgender health needs to increase among Endocrinologists
- Strategies include:
  - Development of online training modules
  - Expansion of formal transgender health curriculum in fellowship programs
  - Presentations at national and international meetings

JCEM 2017

Figure 1. Percent of Adults Who Identify as Transgender in the United States



CDC's Behavioral Risk Factor Surveillance System 2016

Table 1. Estimated Population of Adults Who Identify as Transgender by State of Residence

STATE	POPULATION	PERCENT	RANK
United States of America	1,397,150	0.58%	-
Alabama	22,500	0.61%	15
Alaska	2,700	0.49%	33
Arizona	30,550	0.62%	12
Arkansas	13,400	0.60%	18
California	218,400	0.76%	2
Colorado	20,850	0.53%	27
Connecticut	12,400	0.44%	37
Delaware	4,550	0.64%	9
District of Columbia[7]	14,550	2.77%	-
Florida	100,300	0.66%	6
Georgia	55,650	0.75%	4
Hawaii	8,450	0.78%	1
Idaho	4,750	0.41%	43
Illinois	49,750	0.51%	30
Indiana	27,600	0.56%	23

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- Estimated 0.58% of adults in the US identify as transgender (1.4 million)

- 1 in 5 transgender people who had contact with a medical professional about their gender identity said their provider had tried to stop them from being transgender (Medscape Medical News, 2015 Transgender Survey)

- 70% of transgender individuals have suffered some form of mistreatment at the hands of medical providers including harassment & violence (Lambda Legal)

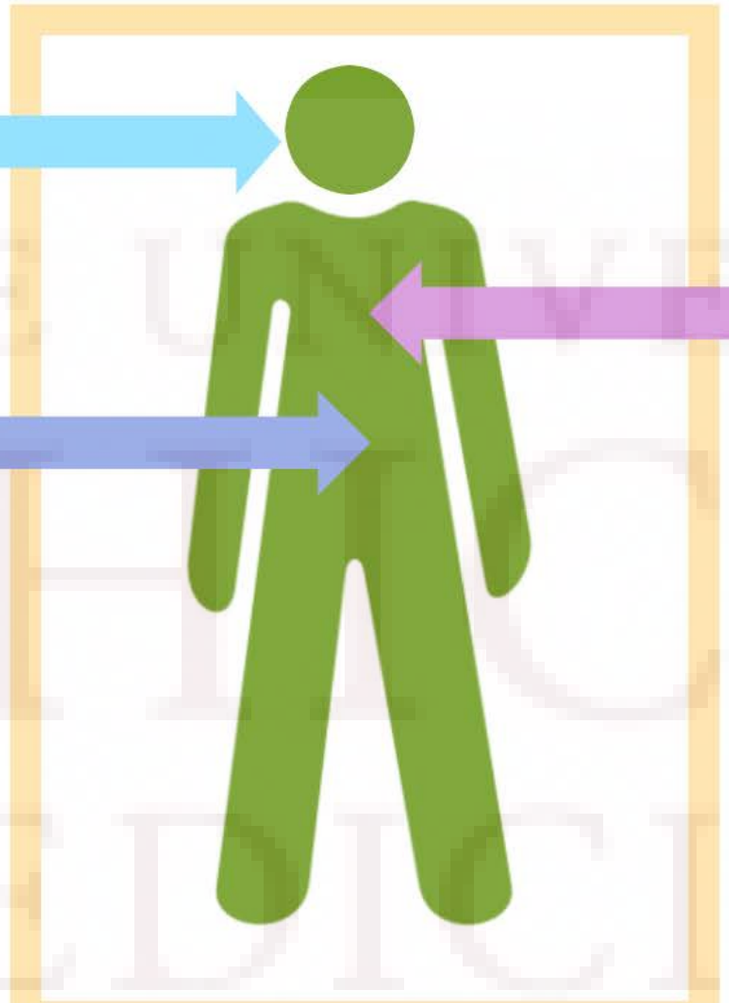
Which is the most accurate definition of “gender identity”

- A. The way a person identifies their sexual orientation
- B. The gender assigned to a child at birth
- C. The way a person expresses their gender
- D. A person’s internal sense of their gender

Reviewing Terminology

Gender Identity
- What your internal sense tells you your gender is

Sexual Orientation
- Whom you are physically and emotionally attracted to
- Whom you have sex with
- How you identify your sexuality



Sex
- Refers to the presence of specific anatomy. Also may be referred to as 'Assigned Sex at Birth'

Gender Expression
- How you present your gender to society through clothing, mannerisms, etc.

Transgender: Gender identity does not align with societal expectations for assigned sex

Cisgender: Gender identity aligns with societal expectations for assigned sex

Common Terminology

- Transgender woman, trans woman, MTF
  - born male at birth, usually prefer “she” or “her” pronouns
- Transgender man, trans man, FTM
  - born female at birth, usually prefer “he” or “his” pronouns
- Genderqueer, or nonbinary: Someone who identifies as neither gender, both genders, or a combination of male and female genders
  - may use any pronoun, or use “they” or “their”

Difference Between Gender Nonconformity & Gender Dysphoria

- Gender Dysphoria: DSM-5 diagnosis for individuals who have a strong and persistent cross-gender identification and a persistent discomfort with his or her sex, or sense of inappropriateness in the gender role of that sex (previously Gender Identity Disorder)

- Gender nonconformity refers to the extent to which a person's gender identity, role, or expression differs from the cultural norms prescribed for people of a particular sex

- The World Professional Association for Transgender Health (WPATH) released a statement in 2010 for the de-psychopathologization of gender nonconformity worldwide:

- "the expression of gender characteristics, including identities, that are not stereotypically associated with one's assigned sex at birth is a common and culturally-diverse human phenomenon that should not be judged as inherently pathological or negative"

Taking Care of Transgender Patients

- Providers should not assume that all gender variant individuals have the same attitudes, behaviors, beliefs, experiences

- Honor the patient’s preferred gender identity & use the pronouns they use

- Apologize if you misgender a patient

- Recognize that not every transgender person who comes to you for hormones wants to have surgery

Non-Medical & Medical Treatment/Options for Gender Affirmation

- Non medical changes in the person's gender expression or role: possibly including binding or padding of breasts, hips or buttocks, penile tucking or use of prostheses

- Support groups & services

- Changes in name & gender markers (socially & on ID)

- Hair removal techniques, voice & communication therapy

- Psychotherapy or counseling

- Cross-sex hormone therapy or surgery to alter secondary sexual characteristics of the body

Provider Responsibilities

- Providing initial evaluation that includes patient transition goals, health history, risk assessment and relevant labs
- Discuss expected effects and fertility risks
- Confirm Pt has capacity to understand risks/benefits & can give informed consent
  - Letter from MHP and/or 3 mos of “real life” experience
  - vs Informed Consent Model
- Provide ongoing medical monitoring

Standards of Care

for the Health of Transsexual, Transgender, and Gender Nonconforming People

The World Professional Association for Transgender Health

7th Version[1] | www.wpath.org

WPATH: is an international, multidisciplinary, professional association whose mission is to promote evidenced based care, education, research, advocacy public policy & respect for transgender health

Endocrine Society: “The WPATH SOC have provided mental health and medical professionals with general guidelines for the evaluation & treatment of transsexual persons”

J Clin Endocrinol Metab 2009. 94:3132-3154.

The Endocrine Society's

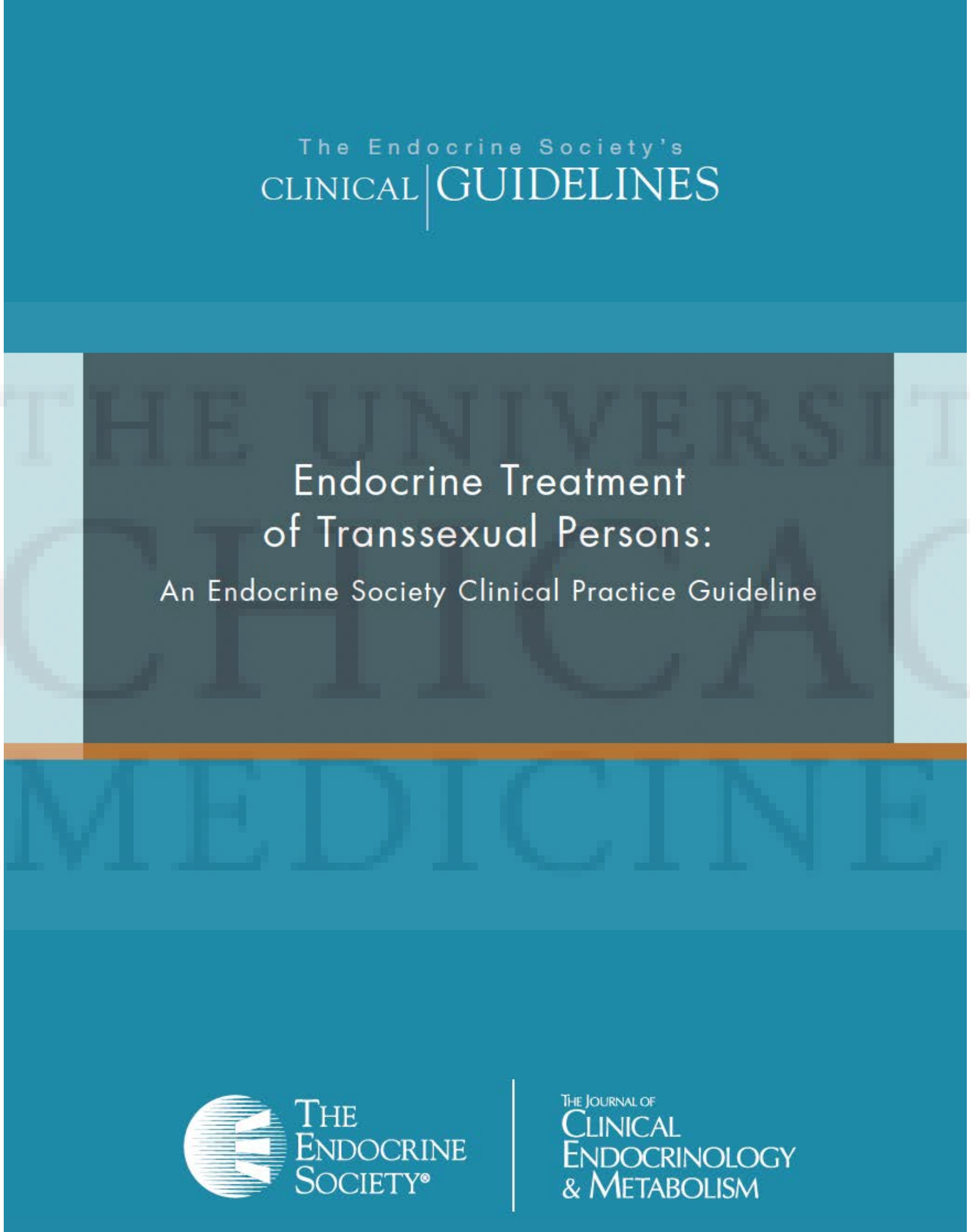
CLINICAL | GUIDELINES

Endocrine Treatment of Transsexual Persons:

An Endocrine Society Clinical Practice Guideline

THE ENDOCRINE SOCIETY®

THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM



Updated in 2009

Endocrine Society Guidelines

- Goal of transgender hormonal treatment:
  - Suppress endogenous hormone secretion determined by the person's genetic/biologic sex
  - Maintain sex hormone levels within normal range for the person's desired gender
- A MHP must recommend endocrine treatment & participate in ongoing care throughout the endocrine transition & decision for surgical sex reassignment
- Recommend against treating prepubertal children
- Recommend treating transgender adolescents (Tanner 2) by suppressing puberty with GnRH analogues until age 16, after which cross sex hormones can be given
- Suggest surpassing endogenous sex hormones, maintaining physiologic levels of gender appropriate sex hormones & monitoring for known risks

J Clin Endocrinol Metab 2009. 94:3132-3154.

Differences Between Children & Adolescents With Gender Dysphoria

- Important difference between gender dysphoric children & adolescents is the proportion for whom dysphoria persists into adulthood
- Studies have shown most pre-pubertal children are no longer gender dysphoric once puberty begins, most will turn out to be homosexual
    - 12-27% persistence rate of gender dysphoria in children into adulthood
    - period of age 10-13 crucial in their own sense of awareness about their gender identity
- Persistence into adulthood appears to be much higher for adolescents (no formal prospective studies)
    - 100% in f/u study of 70 adolescents
    - 55% in f/u study of 53 adolescents requested HT & surgery, 45% did not return to clinic during adolescence

Categories of Physical Interventions

- Fully Reversible: Use of GnRH analogues to suppress estrogen or testosterone production & consequently delay the physical changes of puberty
    - Alternative to GnRH analogues: spironolactone to decrease androgen effects; Continuous OCPs (or depot medroxyprogesterone) to suppress menses
- Partially Reversible: Hormone therapy to masculinize or feminize the body (at about age 16)
    - Some hormone induced changes may need reconstructive surgery to reverse the effect
- Irreversible: Surgical procedures; Should not be done until age of legal majority in given country (18yo US) & Pt has lived in gender role congruent with gender identity for at least 12 months
- Gender dysphoric youth should undergo a thorough psychodiagnostic equation by a qualified MHP (determination of gender dysphoria & to evaluate for psychiatric co-morbidities)

The Standards of Care. WPATH 7th version.

Early Pubertal Trans Youth

- Netherlands study (2011) examined consequences of pubertal suppression with a GnRH agonist in early mid pubertal gender dysphoric adolescents (J Sex Med. 2011 Aug;8(8):2276-83)

- 70 gender dysphoric adolescents with lifelong gender dysphoria started on GnRH agonist at Tanner 2/3
  - Depressive symptoms decreased
  - General mental health functioning improved
  - All went on to receive cross sex hormone treatment
- Rationale for intervention with puberty suppression:
  - Additional time for gender exploration without pressure of ongoing pubertal development
  - Prevention of permanent development of sex characteristics if adolescent continues to pursue sex reassignment

Late Pubertal Transgender Youth

- Tanner 4/5; Too late for GnRH agonists to block endogenous pubertal development, but can suppress H-P-G axis potentially to allow use of lower hormone doses

- FTM individuals can be treated with testosterone alone

- MTF individuals optimally treated with agent that blocks testosterone secretion/action concurrent with estrogen

J Clin Endocrinol Metab. 2014 Dec;99(12):4379-89.

Criteria for puberty suppressing hormones

1.

Criteria for puberty suppressing hormones

In order for adolescents to receive puberty suppressing hormones, the following minimum criteria must be met:

1. The adolescent has demonstrated a long-lasting and intense pattern of gender nonconformity or gender dysphoria (whether suppressed or expressed);

2. Gender dysphoria emerged or worsened with the onset of puberty;

3. Any co-existing psychological, medical, or social problems that could interfere with treatment (e.g., that may compromise treatment adherence) have been addressed, such that the adolescent's situation and functioning are stable enough to start treatment;

4. The adolescent has given informed consent and, particularly when the adolescent has not reached the age of medical consent, the parents or other caretakers or guardians have consented to the treatment and are involved in supporting the adolescent throughout the treatment process.

The Standards of Care. WPATH 7th version.

TABLE 5. Hormone therapy for adolescents

Adolescents are **eligible** and ready for GnRH treatment if they:

1. Fulfill DSM IV-TR or ICD-10 criteria for GID or transsexualism.
2. Have experienced puberty to at least Tanner stage 2.
3. Have (early) pubertal changes that have resulted in an increase of their gender dysphoria.
4. Do not suffer from psychiatric comorbidity that interferes with the diagnostic work-up or treatment.
5. Have adequate psychological and social support during treatment, AND
6. Demonstrate knowledge and understanding of the expected outcomes of GnRH analog treatment, cross-sex hormone treatment, and sex reassignment surgery, as well as the medical and the social risks and benefits of sex reassignment.

Adolescents are **eligible** for cross-sex hormone treatment if they:

1. Fulfill the criteria for GnRH treatment, AND
2. Are 16 yr or older.

Readiness criteria for adolescents eligible for cross-sex hormone treatment are the same as those for adults.

Hormonal Interventions for Transgender Adolescents (All Currently Off-Label for Gender Nonconforming/Transgender Youth)

A. Inhibitors of gonadal sex steroid secretion or action
1. GnRH analogs: inhibition of the hypothalamic-pituitary-gonadal axis (FTM and MTF)
a. Leuprolide acetate im (1- or 3-mo preparations) or sc (1-, 3-, 4-, or 6-mo preparations) at dose sufficient to suppress pituitary gonadotropins and gonadal sex steroids
b. Histrelin acetate sc implant (once-yearly dosing, although may have longer effectiveness)
c. Other options: goserelin acetate sc implant (4- or 12-wk preparations); nafarelin acetate intranasal (multiple daily doses) also available, but no reported use in this population
2. Alternative approaches
a. Medroxyprogesterone acetate orally (up to 40 mg/d) or im (150 mg every 3 mo): inhibition of hypothalamic-pituitary-gonadal axis and direct inhibition of gonadal steroidogenesis (FTM and MTF)
b. Spironolactone (25 to 50 mg/d with gradual increase to 100–300 mg/d orally, divided into twice daily dosing): inhibition of T synthesis and action (MTF)
c. Cyproterone acetate (gradual increase up to 100 mg/d orally; not available in United States): inhibition of T synthesis and action (MTF)

J Clin Endocrinol Metab. 2014 Dec;99(12):4379-89.

B. Cross-sex hormones

1. MTF: estrogen--17β-estradiol

a. Transdermal: twice weekly patches (6.25 μg [achieved by cutting a 25-μg patch] with gradual increase to full adult dose)

b. Oral/sublingual: daily (0.25 mg with gradual increase to full adult dose of 6–8 mg/d)

c. Parenteral im (synthetic esters of 17β-estradiol): estradiol valerate (5–20 mg up to 30–40 mg/2 wk) or estradiol cypionate (2–10 mg/wk)

2. FTM: testosterone

a. Parenteral im or sc (synthetic esters of T): T cypionate or enanthate (12.5 mg/wk or 25 mg/2 wk, with gradual increase to 50–100 mg/wk or 100–200 mg/2 wk)

b. Transdermal (consider once the full adult T dose has been achieved parenterally): patch (2.5–7.5 mg/d) or 1% gel (2.5–10 g/d of gel = 25–100 mg/d of T)

J Clin Endocrinol Metab. 2014 Dec;99(12):4379-89.

Monitoring

Nicole Maines, 14, her twin brother, Jonas, and their parents have traveled a long, trying road. (Suzanne Kreiter/Globe Staff)

The Children's Hospital Gender Management Services Clinic was founded in 2007 by endocrinologist Norman Spack and urologist David Diamond, the clinic - known as GeMS and modeled on a Dutch program - is the first pediatric academic program in the Western Hemisphere that evaluates and treats pubescent transgender individuals

- Adolescent's physical development should be carefully monitored during pubertal suppression

Monitoring

Measure	Frequency
A. Pubertal suppression	
1. Physical exam: height, weight, Tanner staging	T 0 and every 3 mo
2. Hormonal studies: ultrasensitive LH, FSH, estradiol/T	T 0 and every 3 mo
3. Metabolic: calcium, phosphorous, alkaline phosphatase, 25-hydroxyvitamin D (see also Ref. 6)	T 0 and yearly
4. Bone density: DEXA	T 0 and yearly
5. Bone age	T 0 and yearly

J Clin Endocrinol Metab. 2014 Dec;99(12):4379-89.

B. Cross-sex hormone treatment in previously suppressed patients or in late pubertal patients not previously suppressed	
1. Physical exam: height, weight, Tanner staging, blood pressure (for FTM, in particular); monitor for adverse reactions	T 0 and q 3 mo[a]
2. Hormonal studies: ultrasensitive LH, FSH, estradiol/T	T 0 and q 3 mo[a]
If MTF, also monitor Prolactin	T 0 and yearly
3. Metabolic: calcium, phosphorous, alkaline phosphatase, 25-hydroxyvitamin D, complete blood count, renal and liver function, fasting lipids, glucose, insulin, glycated hemoglobin	T 0 and q 3 mo[a]
If MTF on spironolactone, serum electrolytes (potassium)	T 0 and q 3 mo[a]
4. Bone density: DEXA (if puberty previously suppressed)	T 0 and yearly[b]
5. Bone age (if puberty previously suppressed)	T 0 and yearly[b]

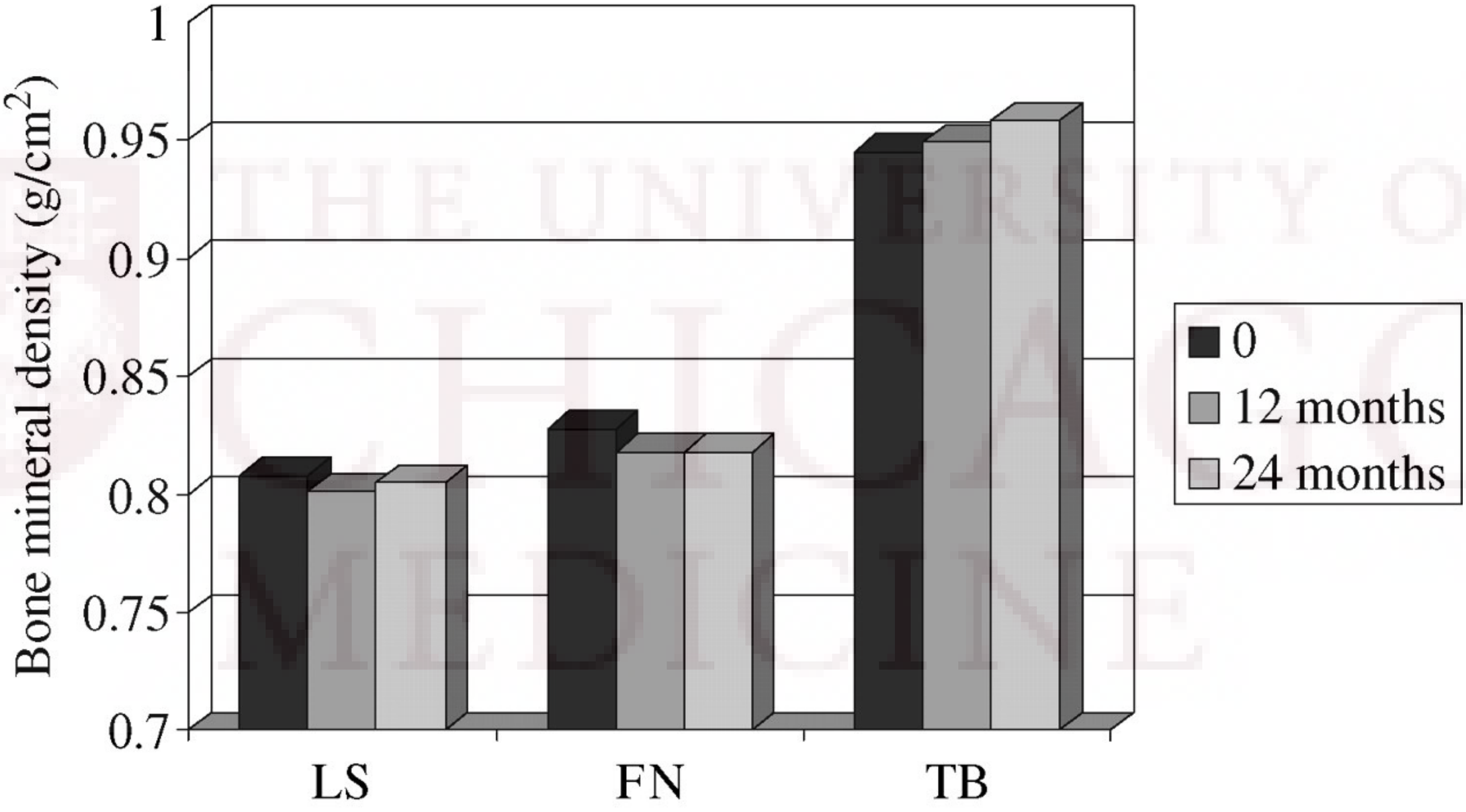
a: every 3-12 mos; b: until puberty is completed

J Clin Endocrinol Metab. 2014 Dec;99(12):4379-89.

Figure 3 Bone mineral density of the lumbar spine (LS), femoral neck (FS) and total body (TB) in nine transsexual adolescents during a period of 24 months of treatment with a GnRH analogue (GnRHa), measured just prior to the start of the GnRHa treatment (0) and after 12 and 24 months.

Henriette A Delemarre-van de Waal, and Peggy T Cohen-Kettenis
Eur J Endocrinol 2006;155:S131-S137

Figure 3 Bone mineral density of the lumbar spine (LS), femoral neck (FS) and total body (TB) in nine transsexual adolescents during a period of 24 months of treatment with a GnRH analogue (GnRHa), measured just prior to the start of the GnRHa treatment (0) and after 12 and 24 months.



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Eur J Endocrinol 2006;155:S131-S137

Arch Sex Behav (2011) 40:843–847
DOI 10.1007/s10508-011-9758-9

CLINICAL CASE REPORT SERIES

Puberty Suppression in a Gender-Dysphoric Adolescent: A 22-Year Follow-Up

Peggy T. Cohen-Kettenis · Sebastiaan E. E. Schagen · Thomas D. Steensma · Annelou L. C. de Vries · Henriette A. Delemarre-van de Waal

- A 22-year follow-up of the first described gender-dysphoric adolescent (FTM) treated with GnRH agonist and cross-sex hormones

- Reported overall psychological well-being with no clinical signs of adverse effects on brain development; furthermore, BMD was within the normal range for both sexes

Adult Hormone Therapy

The criteria for hormone therapy are as follows:

1. Persistent, well-documented gender dysphoria;

2. Capacity to make a fully informed decision and to consent for treatment;

3. Age of majority in a given country (if younger, follow the *Standards of Care* outlined in section VI);

4. If significant medical or mental health concerns are present, they must be reasonably well-controlled.

The Standards of Care. WPATH 7th version.

Medical Necessity of HT

- Feminizing/Masculinizing HT is medically necessary for many transgender and gender nonconforming individuals with gender dysphoria

- Some people seek maximum feminization/masculinization

- Others experience relief of dysphoria with an androgynous presentation resulting from hormonal minimization of existing sex characteristics

- HT must be individualized on Pt's goals, the risk/benefit ratio of medications, the presence of other medical conditions, & consideration of social and economic issues

Informed Consent Model

- Protocol for providing HT consistent with WPATH SOC guidelines
- Instead of requesting a letter from a MHP or proof of “real life experience” patients are given complete and accurate information regarding their decision about getting hormone therapy (HT) or not
- Informed consent:
  - The person has the correct information about HT
  - The person can understand the information about HT
  - The person can use the information to make a decision

Informed Consent Form for Feminizing or Masculinizing Hormones

- Role of hormones & how they change the body
- Effects of hormone therapy
- Fertility aspects, option for sperm banking or egg freezing
- What changes to expect & when to expect them
- Possible health problems/side effects that may occur
- Screening for & addressing acute or current mental health concerns
- Expectation for continued monitoring
- Consent form signature page (Pt & Medical Provider)

Informed Consent for Feminizing Hormone Therapy

This informed consent will tell you about the use of hormones to make your body look more feminine. To make your body look more feminine, your medical provider will prescribe a feminine hormone called estrogen, a medicine to block your body from making the male hormone testosterone (called an androgen antagonist, anti-androgen or testosterone blocker) or both. This is also called feminizing hormone therapy. While there are risks that can come from using these medicines, when you get your prescription from a medical provider who understands how to prescribe these medicines, they can improve your mental health and the quality of your life.

Hormone therapy changes your body in certain ways. These changes are known as the "effects" of hormone therapy. Some of these effects are permanent and will never go away, even if you stop taking hormone therapy. Some of the effects are reversible and will go away if you stop taking hormone therapy. People will respond in different ways to hormone therapy. HBHC wants to give you the clearest picture of what changes to expect and when to expect them when you take hormone therapy, knowing that not all people will experience exactly the same changes.

While hormone therapy can change your body in ways you like, there are also some risks when you take hormone therapy. A risk is an unwanted effect from taking hormone therapy that can sometimes create health problems. Most people do not have health problems when they take hormone therapy. While these problems can happen to anyone (even people who are not taking hormone therapy), the chances of them happening to you are higher if you are taking hormone therapy. Medical science cannot tell you for sure how much more likely you are to have a problem, but taking hormone therapy does increase your risk.

You are asked to sign this form to show that you understand the changes that will happen when you take hormone therapy. This includes changes you want and changes that could harm your health. If you have any questions or worries about this information, please talk with your medical provider or your hormone advocate, so you can make an informed decision about your health care. It is your right to see another medical provider if you want another opinion on your care.

What Changes to Expect and When to Expect Them

Changes	When will changes start? When will changes be complete?	Reversible or Permanent?
Growing Breasts	Start: 3-6 months Complete: 2-3 years	Permanent
Hair on my body and face will get thinner, smoother and grow slower	Start: 6-12 months Complete: after 3 years	Reversible
Skins gets softer	Start: 3-6 months Complete: Unknown	Reversible
Fat moves to different places on my body (less on tummy, more on hips and thighs)	Start: 3-6 months Complete: 2-5 years	Reversible
Smaller muscles with less strength	Start: 3-6 months Complete: 1-2 years	Reversible
Drop in sex drive	Start: 1-3 months Complete 1-2 years	Unknown
Fewer morning or unexpected erections	Start: 1-3 months Complete: 3-6 months	Unknown
Harder to get and keep an erection	Start: Different for Everyone Complete: Different for Everyone	Unknown
Problems making healthy sperm and problems making someone pregnant	Start: Different for Everyone Complete: Different for Everyone	Possibly Reversible
Testicles (balls) shrink 25-50%	Start: 3-6 months Complete: 2-3 years	Unknown
Slowing or stopping hair loss hormones are hair pattern goes back to where it would be if	Start: Hair does not re-grow in bald spots, but you stop losing more hair after 1-3 months Complete: 1-2 years	When stopped, the

Likely Increased Risk: People on feminizing hormone therapy seem to have these problems more often than people who are not on hormone therapy.
Complications:
1) Blood clots in my legs, lungs or brain. There is a higher chance of this with estrogen pills than with the patch. There is a higher chance for people who are over 40 years old, people who are overweight and people with a blood clot problem.
2) High cholesterol, especially triglycerides. There is a higher chance with estrogen pills than with the patch.
3) Gaining weight
4) Liver inflammation
5) Gallstones or gallbladder disease

Likely Increased Risk When You Have Other Health Problems: People on feminizing hormone therapy seem to have these problems more often than people who are not on hormone therapy only if they have other health problems, such as cigarette smoking, diabetes, or a history of heart disease.
Complications:
1) Heart problems (such as heart attack)
Possible Increased Risk: People on feminizing hormone therapy may have these problems more often than people who are not on hormone therapy or they may not.
Complications:
1) High blood pressure
2) High levels of prolactin (which may be caused by a tumor on the pituitary gland in my brain).
3) Changes in electrolytes in my blood. Spironolactone (a testosterone blocker) can create too much potassium which can cause heart problems that can kill me.

Possible Increased Risk When Other Risk Factors Are Present: People on feminizing hormone therapy may have these problems more often than people who are not on hormone therapy only if they already have other things that put them at risk, like a family history of diabetes, obesity, or certain ethnicities.
Complications:

I understand that if I have any new symptoms, if I have any symptoms that worry me or if I have questions about these risks while on feminizing hormone therapy, I should make an appointment with my medical provider.

I understand that using tobacco or smoking cigarettes can hurt my health and may give me a higher chance of blood clots, stroke, heart attacks and high blood pressure, especially when I am taking estrogen. I understand that if I smoke, it will improve my health if I quit smoking before taking estrogen. My medical provider can give me information to help me quit smoking.

I agree to follow the directions on my medicine, using the amount of medicine my medical provider suggests. I understand that taking more than is prescribed or taking additional hormones I may get somewhere else can give me serious health problems or side effects. Too much estrogen in my body may actually slow the changes I want.

I understand that taking any illegal drug (like marijuana, heroin, cocaine, X, meth), dietary supplements (like vitamins, minerals, fish oil), herbal supplements (like St John's Wort), extra hormones I get other places, or any other medicines may mix with my feminine hormone therapy. I am aware that some of these mixtures may cause dangerous medical problems or even death. I agree to discuss any supplements or medications I am taking that were given to me by someone outside HBHC with my medical provider.

I understand that my medical provider can stop my hormone therapy for medical or safety reasons. I understand that stopping hormone therapy may not reverse some of the changes in my body.

I understand that taking feminizing hormone therapy will make changes in my body that can be noticed by other people. Some people who have taken hormone therapy have been hurt or treated badly or unfairly by other people because of the way they look. . Other people have been hurt, ignored or left by family and friends because they took hormone therapy. I understand that HBHC can offer me information about getting counseling or support if I feel this would be helpful now or in the future.

Feminizing Hormone Therapy Consent Form Signature Page

Howard Brown Health Center's Feminizing Hormone Therapy Consent form was given to me upon discussion the program with my primary care physician at Howard Brown Health Center (HBHC).

I have read the consent form. It has been explained to me and I understand it. By signing below, I acknowledge that I have received a copy of the Feminizing Hormone Therapy Consent Form.

Signing my name below means that I understand the information on this form. I have completed all the steps at HBHC to get a prescription for hormone therapy, and I want to continue with feminizing hormone therapy.

Patient Preferred Name (printed): Nina Test
Date of Birth: 04/30/1977
Patient Legal Name (if different) (printed) Nina Test

Patient Legal Signature _____ Date March 1, 2017

Medical Provider Signature _____ Date March 1, 2017

Summary of Informed Consent Model

- The focus is on obtaining informed consent as the threshold for the initiation of HT in a multidisciplinary, harm reduction environment
- Less emphasis is placed on the provision of mental health care until the patient requests it, unless significant mental health concerns are identified that would need to be addressed before hormone prescription

Effects of Hormone Therapy

- Feminizing/masculinizing HT will induce physical changes that are more congruent with a Pt's gender identity

- In FTM patients, the following are expected to occur: depend voice, clitoral enlargement (variable), growth in facial and body hair, cessation of menses, atrophy of breast tissue, increased libido, decreased percentage of body fat compared to muscle mass

- In MTF patients, the following physical changes are expected to occur: breast growth (variable), decreased libido & erections, decreased testicular size, increased percentage of body fat compared to muscle mass

TABLE 1B: EFFECTS AND EXPECTED TIME COURSE OF FEMINIZING HORMONES [A]

TABLE 1B: EFFECTS AND EXPECTED TIME COURSE OF FEMINIZING HORMONES [A]

Effect	Expected Onset[B]	Expected Maximum Effect[B]
Body fat redistribution	3-6 months	2-5 years
Decreased muscle mass/ strength	3-6 months	1-2 years[C]
Softening of skin/decreased oiliness	3-6 months	unknown
Decreased libido	1-3 months	1-2 years
Decreased spontaneous erections	1-3 months	3-6 months
Male sexual dysfunction	variable	variable
Breast growth	3-6 months	2-3 years
Decreased testicular volume	3-6 months	2-3 years
Decreased sperm production	variable	variable
Thinning and slowed growth of body and facial hair	6-12 months	> 3 years[D]
Male pattern baldness	No regrowth, loss stops 1-3 months	1-2 years

TABLE 1A: EFFECTS AND EXPECTED TIME COURSE OF MASCULINIZING HORMONES [A]

TABLE 1A: EFFECTS AND EXPECTED TIME COURSE OF MASCULINIZING HORMONES [A]

Effect	Expected Onset[B]	Expected Maximum Effect[B]
Skin oiliness/acne	1-6 months	1-2 years
Facial/body hair growth	3-6 months	3-5 years
Scalp hair loss	>12 months[C]	variable
Increased muscle mass/strength	6-12 months	2-5 years[D]
Body fat redistribution	3-6 months	2-5 years
Cessation of menses	2-6 months	n/a
Clitoral enlargement	3-6 months	1-2 years
Vaginal atrophy	3-6 months	1-2 years
Deepened voice	3-12 months	1-2 years

Risk Assessment

- MTF: No absolute contraindications to feminizing therapy per se, but there are for the types of feminizing agents
  - Contraindications to estrogen: Previous DVT related to underlying hyper coagulable condition, Hx of estrogen sensitive neoplasm, end stage liver disease
- FTM: Contraindications to testosterone: pregnancy, unstable CAD, untreated polycythemia (Hct>55%)
  - Increased prevalence of PCOS in FTM Pts, associated with increased risk for DM, cardiac disease, HTN, ovarian/endometrial cancers; Symptoms of PCOS should be evaluated prior to initiating testosterone

TABLE 2: RISKS ASSOCIATED WITH HORMONE THERAPY. BOLDED ITEMS ARE CLINICALLY SIGNIFICANT

TABLE 2: RISKS ASSOCIATED WITH HORMONE THERAPY. BOLDED ITEMS ARE CLINICALLY SIGNIFICANT

Risk Level	Feminizing hormones	Masculinizing hormones
Likely increased risk	Venous thromboembolic disease[A] Gallstones Elevated liver enzymes Weight gain **Hypertriglyceridemia**	Polycythemia Weight gain Acne Androgenic alopecia (balding) Sleep apnea
Likely increased risk with presence of additional risk factors[B]	Cardiovascular disease	
Possible increased risk	**Hypertension** Hyperprolactinemia or prolactinom[A]	Elevated liver enzymes **Hyperlipidemia**
Possible increased risk with presence of additional risk factors[B]	**Type 2 diabetes**[A]	**Destabilization of certain psychiatric disorders**[C] **Cardiovascular disease** **Hypertension** **Type 2 diabetes**
No increased risk or inconclusive	**Breast cancer**	Loss of bone density **Breast cancer** **Cervical cancer** **Ovarian cancer** **Uterine cancer**

Likely Increased Risks of MTF Therapy

Venous thromboembolic disease

- Estrogen use increases the risk of venous thromboembolic events (VTE), particularly in patients who are over age 40, smokers, highly sedentary, obese, and who have underlying thrombophilic disorders.
- This risk is increased with the additional use of third generation progestins.
- This risk is decreased with use of the transdermal route of estradiol administration, which is recommended for patients at higher risk of VTE.

Cardiovascular, cerebrovascular disease

- Estrogen use increases the risk of cardiovascular events in patients over age 50 with underlying cardiovascular risk factors. Additional progestin use may increase this risk.

Likely Increased Risks of MTF Therapy

Lipids

- Oral estrogen use may markedly increase triglycerides in patients, increasing the risk of pancreatitis and cardiovascular events.
- Different routes of administration will have different metabolic effects on levels of HDL cholesterol, LDL cholesterol and lipoprotein(a).
- In general, clinical evidence suggests that MtF patients with pre-existing lipid disorders may benefit from the use of transdermal rather than oral estrogen.

Liver/gallbladder

- Estrogen and cyproterone acetate use may be associated with transient liver enzyme elevations and, rarely, clinical hepatotoxicity.
- Estrogen use increases the risk of cholelithiasis (gall stones) and subsequent cholecystectomy.

Possible Increased Risks of MTF Therapy

Type 2 diabetes mellitus

- Feminizing hormone therapy, particularly estrogen, may increase the risk of type 2 diabetes, particularly among patients with a family history of diabetes or other risk factors for this disease.

Hypertension

- Estrogen use may increase blood pressure, but the effect on incidence of overt hypertension is unknown.
- Spironolactone reduces blood pressure and is recommended for at-risk or hypertensive patients desiring feminization.

Prolactinoma

- Estrogen use increases the risk of hyperprolactinemia among MtF patients in the first year of treatment, but this risk unlikely thereafter.
- High-dose estrogen use may promote the clinical appearance of preexisting but clinically unapparent prolactinoma.

Inconclusive Risks of MTF Therapy

Breast cancer

- MtF persons who have taken feminizing hormones do experience breast cancer, but it is unknown how their degree of risk compares to that of persons born with female genitalia.
- Longer duration of feminizing hormone exposure (i.e., number of years taking estrogen preparations), family history of breast cancer, obesity (BMI >35), and the use of progestins likely influence the level of risk.

Likely Increased Risks of FTM Therapy

Polycythemia

- Masculinizing hormone therapy involving testosterone or other androgenic steroids increases the risk of polycythemia (hematocrit > 50%), particularly in patients with other risk factors.
- Transdermal administration and adaptation of dosage may reduce this risk

Weight gain/visceral fat

- Masculinizing hormone therapy can result in modest weight gain, with an increase in visceral fat.

Possible Increased Risks of FTM Therapy

Lipids

- Testosterone therapy decreases HDL, but variably affects LDL and triglycerides.
- Supraphysiologic (beyond normal male range) serum levels of testosterone, often found with extended intramuscular dosing, may worsen lipid profiles, whereas transdermal administration appears to be more lipid neutral.
- Patients with underlying polycystic ovarian syndrome or dyslipidemia may be at increased risk of worsening dyslipidemia with testosterone therapy.

Liver

- Transient elevations in liver enzymes may occur with testosterone therapy.
- Hepatic dysfunction and malignancies have been noted with oral methyltestosterone. However, methyltestosterone is no longer available in most countries and should no longer be used.

Possible Increased Risks of FTM Therapy

Psychiatric

Masculinizing therapy involving testosterone or other androgenic steroids may increase the risk of hypomanic, manic, or psychotic symptoms in patients with underlying psychiatric disorders that include such symptoms. This adverse event appears to be associated with higher doses or supraphysiologic blood levels of testosterone

Inconclusive or No Risks of FTM Therapy

Osteoporosis

- Testosterone therapy maintains or increases bone mineral density among FtM patients prior to oophorectomy, at least in the first three years of treatment.
- There is an increased risk of bone density loss after oophorectomy, particularly if testosterone therapy is interrupted or insufficient. This includes patients utilizing solely oral testosterone.

Cardiovascular

- Masculinizing hormone therapy at normal physiologic doses does not appear to increase the risk of cardiovascular events among healthy patients.
- Masculinizing hormone therapy may increase the risk of cardiovascular disease in patients with underlying risks factors.

Inconclusive or No Risks of FTM Therapy

Hypertension

- Masculinizing hormone therapy at normal physiologic doses may increase blood pressure but does not appear to increase the risk of hypertension.
- Patients with risk factors for hypertension, such as weight gain, family history, or polycystic ovarian syndrome, may be at increased risk.

Type 2 diabetes mellitus

- Testosterone therapy does not appear to increase the risk of type 2 diabetes among FtM patients overall.
- Testosterone therapy may further increase the risk of type 2 diabetes in patients with other risk factors, such as significant weight gain, family history, and polycystic ovarian syndrome. There are no data that suggest or show an increase in risk in those with risk factors for dyslipidemia.

Inconclusive or No Risks of FTM Therapy

Breast cancer

- Testosterone therapy in FtM patients does not increase the risk of breast cancer.

Cervical cancer

- Testosterone therapy in FtM patients does not increase the risk of cervical cancer, although it ma increase the risk of minimally abnormal Pap smears due to atrophic changes.

Ovarian cancer

- Analogous to persons born with female genitalia with elevated androgen levels, testosterone therapy in FtM patients may increase the risk of ovarian cancer, although evidence is limited.

Endometrial (uterine) cancer

- Testosterone therapy in FtM patients may increase the risk of endometrial cancer, although evidence is limited.

Hormone Regimen: MTF

Hormone Regimen: MTF

Hormones

	START	MID	MAX
ESTRADIOL	1mg/Qd	4mg	8mg
PREMARIN (ORAL CONJ ESTROGEN)	2.5mg	5mg	10mg
ESTRADIOL VALERATE OR CYPIONATE	5mg q2wks	20mg q2wks	60mg q2wks
ESTRADIOL PATCH	0.1mg/d biw	0.2mg/d biw	0.4 mg/d biw

Hormone Regimen: MTF

Hormones

	START	MID	MAX
ESTRADIOL	1mg/Qd	4mg	8mg
PREMARIN (ORAL CONJ ESTROGEN)	2.5mg	5mg	10mg
ESTRADIOL VALERATE OR CYPIONATE	5mg q2wks	20mg q2wks	60mg q2wks
ESTRADIOL PATCH	0.1mg/d biw	0.2mg/d biw	0.4 mg/d biw

Anti-Androgens*

	START	MID	MAX
SPIRONOLACTONE (QD OR BID) Only used pre-orchiectomy	50mg	100mg	200mg
FLUTAMIDE Only used pre-orchiectomy		125mg bid	
FINASTERIDE	1mg	2.5mg	5mg qd
MEDROXY-PROGESTERONE	2.5mg	5mg	10mg

*Doses typically decrease after orchiectomy

Hormone Regimen: MTF

Hormones

	START	MID	MAX
ESTRADIOL	1mg/Qd	4mg	8mg
PREMARIN (ORAL CONJ ESTROGEN)	2.5mg	5mg	10mg
ESTRADIOL VALERATE OR CYPIONATE	5mg q2wks		
ESTRADIOL PATCH	0.1mg/d biw	0.2mg/d biw	0.4 mg/d biw

Goal: Natal female levels of estradiol (T<200)

Anti-Androgens*

	START	MID	MAX
SPIRONOLACTONE (QD OR BID)	50mg	100mg	200mg
FLUTAMIDE			125mg bid
	1mg	2.5mg	5mg qd
MEDROXY-PROGESTERONE	2.5mg	5mg	10mg

Only used pre-orchiectomy

*Doses typically decrease after orchiectomy

Hormone Regimen: MTF

Hormones

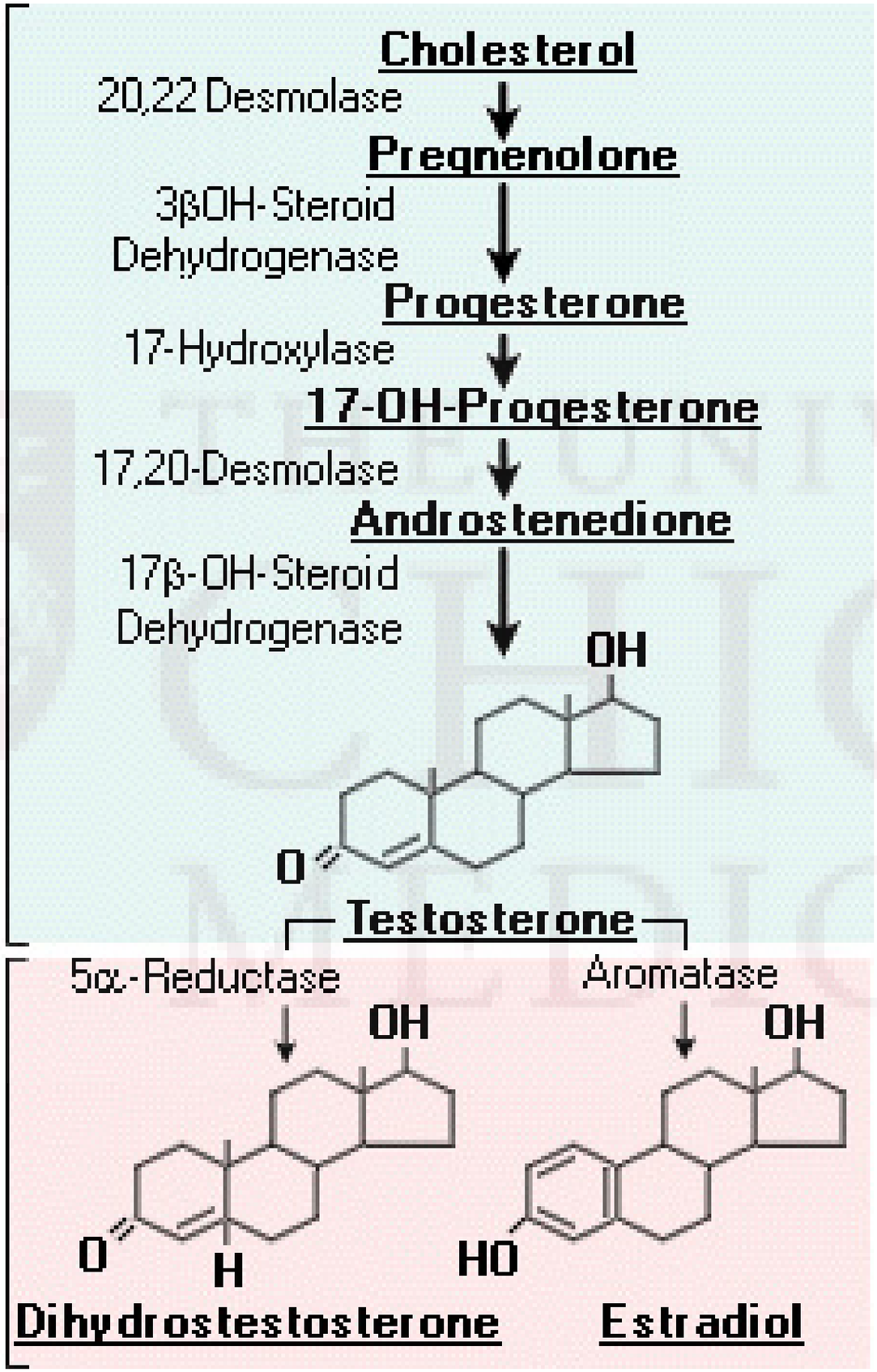
	START	MID	MAX
ESTRADIOL	1mg/Qd	4mg	8mg
PREMARIN (ORAL CONJ ESTROGEN)	2.5mg	5mg	10mg
ESTRADIOL VALERATE OR CYPIONATE	5mg q2wks	20mg q2wks	60mg q2wks
ESTRADIOL PATCH	0.1mg/d biw	0.2mg/d biw	0.4 mg/d biw

Hormone Regimen: MTF

Hormones

	START	MID	MAX	
ESTRADIOL	1mg/Qd	4mg	8mg	1mg tabs x 100: $55.12
PREMARIN (ORAL CONJ ESTROGEN)	2.5mg	5mg	10mg	1.25mg x 100: $623.89
ESTRADIOL VALERATE OR CYPIONATE	5mg q2wks	20mg q2wks	60mg q2wks	20mg/mL 5mL: $144.31
ESTRADIOL PATCH	0.1mg/d biw	0.2mg/d biw	0.4 mg/d biw	0.1mg/d: $88.40

Anti Androgens MOA

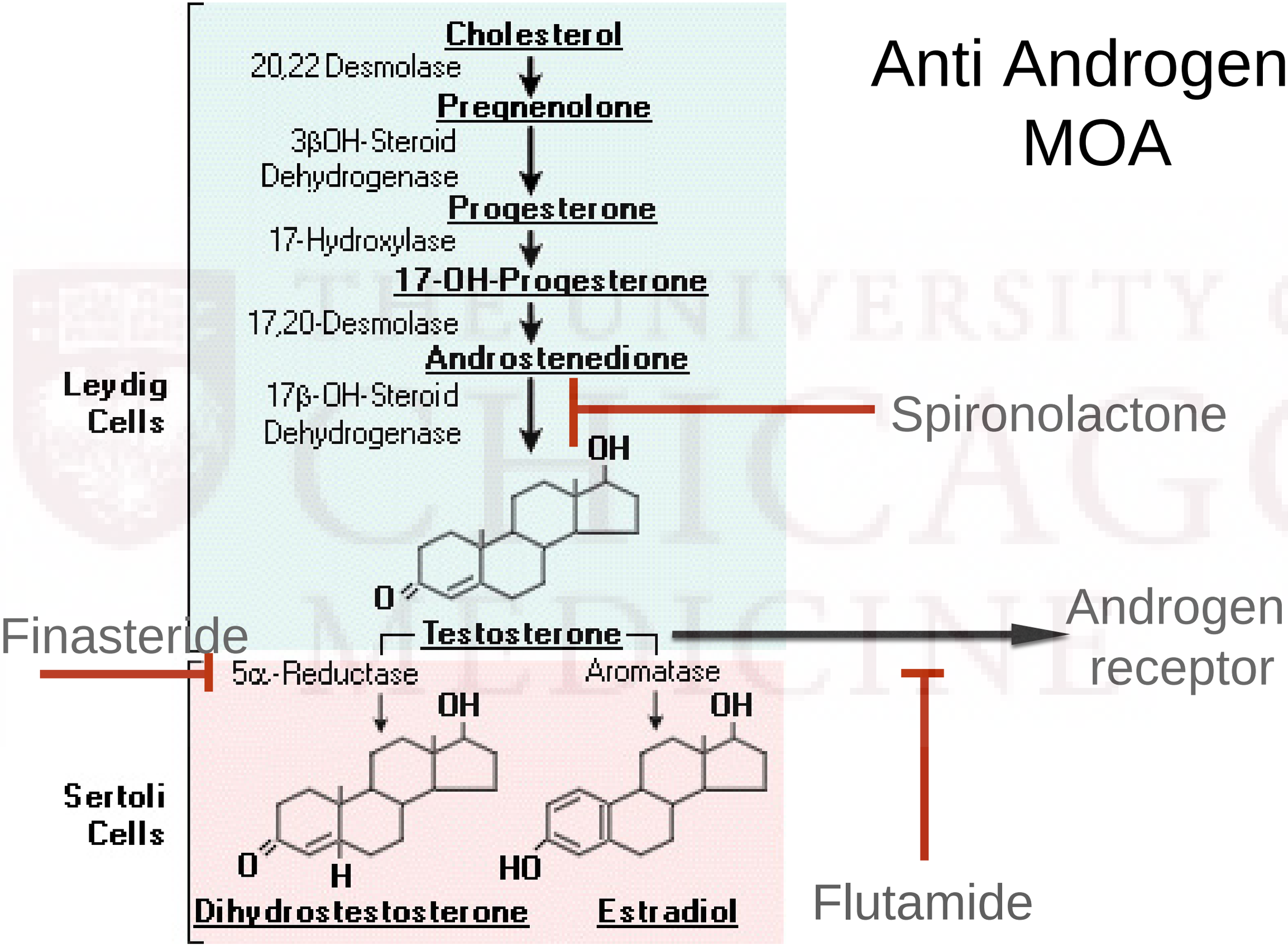


Spironolactone

Finasteride

Flutamide

Anti Androgens MOA



Hormone Regimen: FTM

Hormone Regimen: FTM

	START	MID	MAX
TESTOSTERONE CYPIONATE (cottonseed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk
TESTOSTERONE ENANTHATE (sesame seed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk
ANDRODERM PATCH	2.5mg/ patch qd	5mg/patch qd	7.5mg/ patch qd
TESTOSTERONE 1% GEL	2.5mg qd	5mg qd	10mg qd
TESTOSTERONE CREAM 5% (COMPUNDED)	0.25 g qd	1g qd	2g qd
TESTOSTERONE UNDECANOATE	160 mg/d PO	200mg/d	240mg/d

* Doses may be decreased in oophorectomy in some cases

Hormone Regimen: FTM

	START	MID	MAX
TESTOSTERONE CYPIONATE (cottonseed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk
TESTOSTERONE ENANTHATE (sesame seed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk
ANDRODERM PATCH			
TESTOSTERONE 1% GEL	2.5mg qd	5mg qd	10mg qd
TESTOSTERONE CREAM 5% (COMPUNDED)	0.25 g qd	1g qd	2g qd
TESTOSTERONE UNDECANOATE	160 mg/d PO	200mg/d	240mg/d

Goal: Natal male levels of testosterone (350-700ng/dL)

OTHER MEDS FOR TRANS MEN	DOSE	USE
DEPO-ROVERA	150mg IM Q3mos	for menses cessation
FINASTERIDE	1mg to 5mg Qd	Male pattern baldness

* Doses may be decreased in oophorectomy in some cases

Hormone Regimen: FTM

	START	MID	MAX
TESTOSTERONE CYPIONATE (cottonseed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk
TESTOSTERONE ENANTHATE (sesame seed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk
ANDRODERM PATCH	2.5mg/ patch qd	5mg/patch qd	7.5mg/ patch qd
TESTOSTERONE 1% GEL	2.5mg qd	5mg qd	10mg qd
TESTOSTERONE CREAM 5% (COMPUNDED)	0.25 g qd	1g qd	2g qd
TESTOSTERONE UNDECANOATE	160 mg/d PO	200mg/d	240mg/d

* Doses may be decreased in oophorectomy in some cases

Hormone Regimen: FTM

	START	MID	MAX	
TESTOSTERONE CYPIONATE (cottonseed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk	100mg/mL (10mL): $59.10
TESTOSTERONE ENANTHATE (sesame seed oil)	30mg q wk IM or SQ	60mg q wk	125mg q wk	200mg/mL (5mL): $89.95
ANDRODERM PATCH	2.5mg/ patch qd	5mg/patch qd	7.5mg/ patch qd	4mg/24hr x1 patch: $20.54
TESTOSTERONE 1% GEL	2.5mg qd	5mg qd	10mg qd	25mg/2.5gm x 2.5g: $20.92
TESTOSTERONE CREAM 5% (COMPUNDED)	0.25 g qd	1g qd	2g qd	2% (60g): $87.23
TESTOSTERONE UNDECANOATE	160 mg/d PO	200mg/d	240mg/d	

* Doses may be decreased in oophorectomy in some cases

TABLE 15. Monitoring of MTF transsexual persons on cross-hormone therapy

1. Evaluate patient every 2–3 months in the first year and then 1–2 times per year afterward to monitor for appropriate signs of feminization and for development of adverse reactions.
2. Measure serum testosterone and estradiol every 3 months.
   a. Serum testosterone levels should be <55 ng/dl.
   b. Serum estradiol should not exceed the peak physiological range for young healthy females, with ideal levels <200 pg/ml.
   c. Doses of estrogen should be adjusted according to the serum levels of estradiol.
3. For individuals on spironolactone, serum electrolytes (particularly potassium) should be monitored every 2–3 months initially in the first year.
4. Routine cancer screening is recommended in nontranssexual individuals (breasts, colon, prostate).
5. Consider BMD testing at baseline if risk factors for osteoporotic fracture are present (*e.g.* previous fracture, family history, glucocorticoid use, prolonged hypogonadism). In individuals at low risk, screening for osteoporosis should be conducted at age 60 and in those who are not compliant with hormone therapy.

J Clin Endocrinol Metab, September 2009, 94(9):3132–3154

TABLE 16. Monitoring of FTM transsexual persons on cross-hormone therapy

1. Evaluate patient every 2–3 months in the first year and then 1–2 times per year to monitor for appropriate signs of virilization and for development of adverse reactions.
2. Measure serum testosterone every 2–3 months until levels are in the normal physiological male range:[a]
   a. For testosterone enanthate/cypionate injections, the testosterone level should be measured midway between injections. If the level is >700 ng/dl or <350 ng/dl, adjust dose accordingly.
   b. For parenteral testosterone undecanoate, testosterone should be measured just before the next injection.
   c. For transdermal testosterone, the testosterone level can be measured at any time after 1 wk.
   d. For oral testosterone undecanoate, the testosterone level should be measured 3–5 h after ingestion.
   e. Note: During the first 3–9 months of testosterone treatment, total testosterone levels may be high, although free testosterone levels are normal, due to high SHBG levels in some biological women.
3. Measure estradiol levels during the first 6 months of testosterone treatment or until there has been no uterine bleeding for 6 months. Estradiol levels should be <50 pg/ml.
4. Measure complete blood count and liver function tests at baseline and every 3 months for the first year and then 1–2 times a year. Monitor weight, blood pressure, lipids, fasting blood sugar (if family history of diabetes), and hemoglobin A1c (if diabetic) at regular visits.
5. Consider BMD testing at baseline if risk factors for osteoporotic fracture are present (*e.g.* previous fracture, family history, glucocorticoid use, prolonged hypogonadism). In individuals at low risk, screening for osteoporosis should be conducted at age 60 and in those who are not compliant with hormone therapy.
6. If cervical tissue is present, an annual pap smear is recommended by the American College of Obstetricians and Gynecologists.
7. If mastectomy is not performed, then consider mammograms as recommended by the American Cancer Society.

J Clin Endocrinol Metab, September 2009, 94(9):3132–3154

Typical Health Care Maintenance

- Everyone: Screen BP, HgA1c, & lipids yearly
- Everyone: Screen for breast cancer after age 50 with mammogram is there is breast tissue (may not be necessary in MTF without breast cancer FH)
- FTM/trans men require regular pap screening if they have a cervix (cytology should indicate Pt is on Testosterone as altered epithelium may mimic dysplasia)
  - in FTM: any unexplained vaginal bleeding should be evaluated like a natal female
- FTM: Bone density at age 50 if on T >10yrs, at age 60 otherwise
- MTF: Continue to screen for prostate cancer if there is a prostate
- MTF: Consider adding ASA to trans women >50

Body composition, bone turnover, and bone mass in trans men during testosterone treatment: 1-year follow-up data from a prospective case–controlled study (ENIGI)

E Van Caenegem[1,2], K Wierckx[1,2], Y Taes[1], T Schreiner[2,3], S Vandewalle[1], K Toye[1], B Lapauw[1], J-M Kaufman[1] and **G T'Sjoen[1,2,4]**

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- Prospective study of 23 trans men (FTM) and 23 age matched control cis women.

- Grip strength and biochemical markers of bone turnover were measured as well as BMD and DEXA

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(2015) 172, 163–171

	Baseline			12 months		Paired difference baseline–12 months (%)		
	Control women ($n=23$)	Trans men ($n=23$)	Baseline comparison	Control women ($n=20$)	Trans men ($n=23$)	Control women ($n=20$)	Trans men ($n=23$)	Comparison over time: time×group
Age (years)	27±9	27±9						
Pack year	0 (0–0)	0 (3–4)	†					
Weight (kg)	66.8±7.7	65.5±14.5		68.3±9.1	67.4±11.6	1.6	3.6	
Height (cm)	168.5±5.7	163.3±4.3	†††					
Fracture prevalence (%)[a]	35	20						
Parity (%)[a]	30	17	†					
Sport index[b]	2.9±1.0	3.3±1.5		2.4±1.0	3.6±1.7	−8.6	11.7	
Leisure time index[b]	3.3±0.7	2.6±0.8	†	3.3±0.6	2.8±0.8	4.0	7.6	
Work index[b]	2.3±0.6	2.9±0.7	†	2.4±0.5	3.0±0.8	9.8	5.2	
Total physical activity[b]	8.5±1.5	8.9±2.2		8.0±1.6	9.3±2.5	−1.8	6.2	
Testosterone (ng/dl)	31±12	27±12		29±8	629±225	2.5	2732.2	***
E_2 (pg/ml)	57 (43–124)	54 (24–110)		99 (39–158)	31 (23–36)	62.9	−8.0	***
LH (U/l)[c]	8 (5–14)	5 (4–8)	†	7 (6–9)	2 (0–5)	3.3	−11.0	
FSH (U/l)[d]	7 (5–8)	4 (3–8)		5 (4–6)	5 (1–7)	−11.7	53.8	
25-OH vitamin D (ng/ml)	25±12	19±11		28±14	22±12	22.1	14.1	
P1NP (μg/l)	63±36	62±34		59±31	102±63	−2.9	67.7	***
CTX (ng/ml)	0.46 (0.33–0.68)	0.38 (0.27–0.65)		0.44 (0.38–0.56)	0.48 (0.38–0.65)	1.2	27.0	**

Baseline comparison: all variables were adjusted for height. [a]Using χ^2-test, [b]following Baecke *et al.* 1982 (15), [c]detection limit LH-assay=0.1U/l, [d]detection limit FSH-assay=0.1U/l. Parity: % of participants who gave birth. The baseline comparison (third column) is adjusted for height, the *P* value for the group (control women or trans man) is given by $^{\dagger}P<0.05$, $^{\dagger\dagger\dagger}P\leq0.001$. The comparison over time (last column) is performed by an ANOVA for repeated measurements with group (trans men or control women), visit (baseline or 12 months), and height as independents: *P* value for visit×group, $^{**}P<0.01$, and $^{***}P\leq0.001$.

Table 3 Areal bone parameters in control men and trans men before and after 12 months. Descriptives are expressed as mean ± s.d. or as median (1st–3rd quartile) when not normally distributed.

	Baseline			**12 months**		**Paired difference baseline–12 months** (%)		
	Control women ($n=23$)	Trans men ($n=23$)	Baseline comparison	Control women ($n=20$)	Trans men ($n=23$)	Control women ($n=20$)	Trans men ($n=23$)	Comparison over time: time×group
Lumbar spine								
Bone area (cm^2)	59.2 ± 6.7	56.7 ± 5.1		59.8 ± 7.1	56.6 ± 4.6	0.3	−0.1	
BMC (g)	59.5 ± 9.9	58.4 ± 7.6		59.8 ± 10.1	58.3 ± 6.9	−0.2	−0.1	
aBMD (g/cm^2)	1.008 ± 0.150	1.029 ± 0.085		1.005 ± 0.126	1.029 ± 0.084	−0.5	0.0	
Femoral neck								
Bone area (cm^2)	4.9 ± 0.2	4.9 ± 0.3		5.0 ± 0.3	4.9 ± 0.3	1.9	0.2	
BMC (g)	4.3 ± 0.7	4.2 ± 0.5		4.4 ± 0.7	4.2 ± 0.5	0.7	0.1	
aBMD (g/cm^2)	0.877 ± 0.142	0.861 ± 0.101		0.879 ± 0.143	0.862 ± 0.102	−1.2	0.2	
Total hip								
Bone area (cm^2)	32.8 ± 2.7	33.7 ± 2.7	†	32.8 ± 2.9	33.6 ± 2.8	0.0	−0.2	
BMC (g)	31.4 ± 5.3	32.6 ± 4.3		31.5 ± 5.3	33.1 ± 4.5	−0.5	1.3	**
aBMD (g/cm^2)	0.958 ± 0.146	0.971 ± 0.112		0.963 ± 0.150	0.985 ± 0.112	−0.6	1.5	***
Total body								
Bone area (cm^2)	2050.6 ± 118.7	1970.5 ± 134.4		2061.2 ± 115.0	1967.1 ± 138.2	0.0	−0.2	
BMC (g)	2208.6 ± 267.4	2156.0 ± 222.2		2238.3 ± 275.2	2163.7 ± 217.8	0.3	0.4	
aBMD (g/cm^2)	1.076 ± 0.104	1.093 ± 0.068		1.085 ± 0.110	1.099 ± 0.064	0.3	0.6	
Radius								
Bone area (cm^2)	13.5 ± 0.9	13.3 ± 1.2		13.6 ± 1	13.4 ± 1.2	1.9	0.7	
BMC (g)	7.8 ± 0.7	7.5 ± 0.9		7.9 ± 0.8	7.4 ± 0.9	1.6	−0.3	
aBMD (g/cm^2)	0.582 ± 0.046	0.559 ± 0.041		0.583 ± 0.047	0.555 ± 0.039	−0.3	−1.0	

Results of this Study

- Before hormonal treatment, trans men had similar bone and body composition compared with control women.

- Testosterone treatment induced in trans men a gain in muscle mass and strength and loss of fat mass (in the presence of unchanged BMI and waist and hip circumference)

- Bone markers P1NP and CTX both increased during the first year of treatment in trans men

- Areal and volumetric bone parameters remained largely unchanged apart from a small increase in trabecular vBMD at the distal radius and in BMD at the total hip in trans men. None of these changes were observed in the control group.

- Conclusions: Short-term testosterone treatment in trans men increased muscle mass and bone turnover. The latter may rather reflect an anabolic effect of testosterone treatment rather than bone loss.

Back to Our Patient

CV & CARDIAC MARKERS					
Cholesterol				188	
HDL Cholesterol				58	
LDL Cholesterol,Calc				104 *	
Triglycerides				129	
DIABETIC SCREENING...					
Hb A1C				5.0 *	
LDL Cholesterol,Calc				104 *	
ENDOCRINOLOGY					
Te Binding Globulin					37
Calculated Free Te...					130 *
Total Testosterone					434
Test Information					The Total Test... *

Back to Our Patient

CV & CARDIAC MARKERS					
Cholesterol				188	
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Total Testosterone					434
Test Information					The Total Test... *

- Pt was restarted on previous testosterone dose (100mg/week IM)

- To discuss general maintenance issues like pap smear at next visit

What We As Providers Should Be Aware Of

- Bad experiences are a big reason why LGBT, in particular Transgender individuals do not seek medical care

- Positive interactions with clinicians can increase a transgender person's health care utilization

- Availability of transgender health care itself is a major step towards making the clinical environment welcoming towards transgender individuals

- Physicians should refrain from pathologizing gender nonconformity

- Look for upcoming LGBT provider training in our clinic in the near future! Informed consent letter smart phrase coming soon…

Conclusions-1

- Improved competence & confidence in delivery of transgender health is needed
- Transgender patients seeking gender affirming care require a safe, effective hormone regimen that will 1) Suppress endogenous hormone secretion determined by biologic sex & 2) maintain sex hormone levels within the normal range for the person's desired gender
- Because gender dysphoria does not persist from childhood to adolescence endocrine treatment of pre-pubertal children is not recommended
- Gender dysphoria in transgender adolescents tends to persist into adulthood
- Treatment of transgender adolescents involves suppressing puberty to allow more time for gender identity exploration at Tanner 2 stage & involves GnRH analogues
- Mental health comorbidities in gender dysphoric youth significantly diminish or resolve when such individuals are subject to gender affirming care

Conclusions-2

- Prospective cohort studies focused on long term safety and efficacy are needed to optimize transgender care
- Providing hormonal treatment for gender affirmation should also include risk assessment and continued monitoring
- Depending on Pt's risk profile, there may be appropriate screening tests or exams for conditions affected by HT & ideally should be carried to prior to start of HT
- Hormone providers should address preventative health care with Pts particularly if Pt does not have a PCP
- For more education about transgender care please familiarize yourself with materials from WPATH (wpath.org); Training modules are available at the National LGBT Health Education Center (https://www.lgbthealtheducation.org)

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Objectives

-Learn about Transgender Care in the Endocrinology Setting

-Review the latest Standard of Care Guidelines from the WPATH and from the Endocrine Society for Transgender Care in Adolescents & Adults

-Learn about the Informed Consent Model for Transgender Care

-Discuss Effects of Hormone Therapy & Potential Risks of Treatment