

RANDALL CHILDREN'S HOSPITAL

LEGACY EMANUEL

Masculinizing Hormone Side Effects: Brief List

Testosterone: given by subcutaneous (under the skin) injections

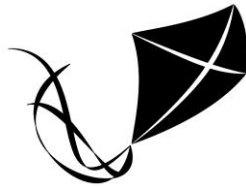
- Effects can take months or longer to be noticeable, and the rate and degree of change cannot be predicted, and may not be complete for 2-5 years

Permanent effects

- Lower voice
- Increased growth of hair
- Genital changes (clitoral growth)

Non – permanent

- Acne
- Fat redistribution
- Increased muscle mass
- Increased libido
- Menstrual periods usually stop within 6-12 months of starting testosterone
- Vaginal dryness
- Decrease estrogen levels and may possibly lead to cessation of ovulation over time
- Future fertility may be affected
- Increases risk of
 - Elevated red blood cell count
 - Liver dysfunction
 - High blood pressure / Heart disease
 - Weight gain
 - Salt retention
 - Lipid (cholesterol) changes (decrease HDL and Increase LDL)
 - Acne
 - Psychological / emotional changes [irritability, frustration, anger]
 - Makes cervix and walls of vagina more fragile
 - Headaches or migraines



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T-Clinic: *Providing Excellence in Multidisciplinary Care to Gender Diverse Youth and Their Families*

Masculinizing Hormones

Hormone therapy can help transgender people feel more comfortable in their bodies, changing their bodies to align more with their gender identity. Like with other medical treatments, there are risks and benefits. This information is to help you and your doctor make the best decisions for what is right for you on your individual gender journey.

So, what is a hormone anyway?

Hormones are chemical messengers that are made in one organ (a gland) and have an effect somewhere else. There are many different glands in the body (thyroid, pituitary, adrenal, testicles, pancreas and others) that produce many different hormones (thyroid, LH, FSH, growth hormone, cortisol, testosterone, insulin and others) that have a wide range of effects on the human body. Hormones are responsible for growth, puberty, overall metabolism, blood sugar regulation, hunger, thirst among other body functions. A hormone must bind to a receptor on a cell for specific actions to occur. All hormones are highly regulated by the body. An Endocrinologist specializes in the study of hormones, and thus helps in prescribing hormones to aid in transition.

And what about these Sex Hormones?

Sex hormones regulate the development of puberty and the changes that result from it. They are mainly produced by a person's sex organ (ovary or testicle), although some are made in one's adrenal gland. These hormones produce the changes we associate with puberty such as facial and body hair, breast growth, bone strength, among others.

There are 3 categories of sex hormones:

1. **Androgens:** testosterone (produced in testicle), dihydrotestosterone (DHT, active form of testosterone, testosterone is converted to this near the organs it effects by an enzyme); other androgens that are produced in the adrenal gland
2. **Estrogens:** estradiol (produced in ovary)
3. **Progestin:** progesterone (produced in ovary)

What is Hormone (Replacement) Therapy (HRT)? Or Cross Hormone Therapy (CHT)?

Both terms refer to taking medicine to change the level of sex hormones in your body. Changing these levels will affect features that are associated with sex and gender. ***Masculinizing hormone therapy can help make the body look and feel less feminine and more masculine.***

What Medicines (or hormones) are Involved:

Testosterone

Testosterone or “T” is the main hormone responsible for promoting “male” physical traits. It works directly on tissues in your body (for example, the clitoris will enlarge, fat will redistribute). T will eventually suppress estrogen production by the ovaries. Most commonly we give T by an injection under the skin (subcutaneously). We can also administer it by intramuscular (in the muscle) injections. While preparations of T in a patch or gel are available for adults, these are not used in children, and do not come in doses accurate enough to put one through puberty.

Medicines to Stop Menses

Eventually menses will stop once your levels of testosterone are high enough to suppress estrogen production. If you would like them stopped sooner, we can use a medication such as Depot Provera (a shot 1x every 3 months), or an Intra Uterine Device (placed by an OB/GYN once every 3 -5 years) or birth control pills that are progestin only. Testosterone is not birth control and some transmales have gotten pregnant while on T unintentionally. If you are on one of these medicines or devices to stop periods, you will also be protected from possible pregnancy.

What is a typical dose?

Masculinization therapy doses will differ from person to person as bodies respond to them differently. Often this is because of our genetics that we inherit from our families. Your doctor will prescribe what best fits your needs based on your medical history, and desired outcome. Our team will also investigate what your insurance will cover and decide with you the most appropriate path forward.

Everyone’s journey is different. Each body absorbs, processes and responds to sex hormones differently. Some people show more changes than others on a similar dose. Changes may happen more quickly in some compared to others. There is no way to predict how your body will respond

before starting T. Taking more hormone than your prescribed dose will not speed up your process. It can slow down changes as excess testosterone in the body can be converted to estrogen! Taking more than prescribed will increase health risks as well.

If you think your dose is too low, or you are not seeing the changes you would expect, please bring this up with your doctor. We may decide it is a good idea to try a different form or combination of medication(s) rather than empirically increasing the dose.

If you decide in the future to remove your ovaries, you will likely need less T to have the same effect, and you will no longer need pubertal suppression if you are on that.

Because your body is unable to produce testosterone, you will need to take T for the rest of your life to *continually* see the effects from it. This is also important for the health of your bones.

Changes and Timeline:

What Changes can I expect?

Masculinizing hormone therapy can have important physical and psychological benefits. Often, bringing the mind and body together eases gender dysphoria and can help you feel better about your body. The amount that taking T helps a person is variable and individual.

It is important to remember that each person responds differently. How quickly changes appear for you depend on:

- Your age
- The number of hormone receptors you have in your body (often determined by genetics)
- How sensitive your body is to T (also determined by genetics)

There is no way of knowing how your body will respond to before you start. You can not pick the changes you want.

Average Timeline	Effect
After 1 to 3 months	~ Increased sex drive ~ Vaginal dryness ~Clitoral Growth (1-3 cm) ~ Increased growth, coarseness and thickness of body hair ~Increased muscle mass and upper body strength ~Redistribution of body fat (more around waist and less around hips)

After 1-6 months	~ Menstrual periods stop
After 3-6 months	~ Voice cracks, starts to drop (can take up to a year)
Gradual Changes (at least 1 yr or more)	~Growth of facial hair ~Possible male pattern balding

At your doctor visits: Since most of these changes happen in the first 2 years, your doctor will want to see you every 3-4 months during this time. Doses will be adjusted, levels will be checked periodically. The doctor will ask about the changes you are noticing and how you feel on the dose you are on. They will ask about what changes you are noticing, how often you are shaving (if applicable) and ask about your sex drive. We obtain levels approximately 2 x a year to help adjust dosing and make sure we are getting to where we want to be.

What Changes are Permanent or not?

Things that are permanent:

- ~ deeper voice ~ hair growth
- ~ male Pattern baldness may not happen (depends on family history)

May or may not reverse:

- ~ clitoral growth ~ body facial hair may decrease but usually does not completely disappear
- ~ the ability to get pregnant

Reversible:

- ~ menstrual periods ~fat muscle and acne/skin changes ~ irritability

Fertility:

Transmales can get pregnant, even when on testosterone. Even if your periods are suppressed on T, it is recommended that you use some form of birth control if you are having sex with someone with a penis. Testosterone is not safe for an unborn fetus, and thus must be stopped if pregnant.

Long term exposure of the ovaries to testosterone is not fully understood. The ability to become pregnant may not return after stopping T. Some studies show encouraging prospects for fertility however, the numbers are small.

Things that will not change:

~ Height: Once you are done growing, there is no way to affect your height with hormones.

~ Speech patterns: T will typically make your voice pitch drop to deeper levels. It does not change intonation, and other speech patterns associated with gender.

~ Body image: often taking hormones significantly improves gender dysphoria as your body becomes more in line with your gender identity. However if you are experiencing body dysphoria that is not improving with hormones, it may be beneficial to speak to a mental health therapist about these concerns.

~ Mental Health: as above, often taking hormones significantly improves gender dysphoria as your body becomes more in line with your gender identity. Life can still present with emotional and social challenges, stress and other factors can contribute to your mental health. Having an established counselor that you feel comfortable talking to can really help work through these struggles.

~ Breast Tissue: Testosterone may slightly change the shape of your breasts by increasing muscle and decreasing fat. However, it does not make breast tissue go away.

~ Bone Structure: Once your bones have stopped growing after puberty, testosterone can not change the size or shape of your bones. It will not increase your height or change the size of your hands and feet.

What are the risks of taking masculinizing hormones?

As treating transmale youth is such a new practice, we do not know the long-term effects of using testosterone. Our knowledge of using testosterone comes from use in older trans patients, as well as in individuals with different medical conditions requiring hormone therapy, such as older cisgender males taking T. Transmedicine is an ongoing field of study and we will know more the longer we are practicing it! And, there may be long term health risks we simply do not know about yet.

We try to create the safest hormone regimen for you by measuring levels and watching for the side effects we know about.

1. Heart disease, stroke and diabetes

Testosterone can increase these risks as it tends to:

- Decrease good cholesterol (HDL) and may increase bad cholesterol (LDL)
- Increase fat deposits around internal organs and in upper abdomen
- Increase in blood pressure
- Decrease your body's sensitivity to insulin
- Cause weight gain, though most of the weight gain is from muscle
- Increase the amount of red blood cells and hemoglobin (a red protein responsible for the transporting oxygen in the blood) you have in your body

The increase in the amount of red blood cells and hemoglobin is usually only to an average “male” range (which does not pose health risks). Occasionally, a higher increase can happen. If this does, it may cause serious problems such as stroke or heart attack. Your levels will be checked regularly while you are on testosterone.

These risks are greater for people who smoke, are overweight, or have family history of heart disease. Your risk of heart disease, stroke, and diabetes can be reduced by taking testosterone as prescribed, monitoring levels periodically, not smoking, and leading a healthy active lifestyle.

2. Headaches and Migraines

Some people will get headaches and migraines after starting T. If you get more frequent headaches or the pain is unusually severe, talk to your primary healthcare provider.

3. Cancer

It is not known if testosterone increases the risk of breast, ovarian or uterine cancers. These types of cancers are all sensitive to estrogen. There is evidence that some testosterone is converted to estrogen, however, compared to assigned females at birth, this level is significantly lower. You are at higher risk for an estrogen dependent cancer if you have a family history of these types of cancers, are 50 years of age or older, or are overweight. Please ask about screening for cancer if you are concerned.

4. Irritability

Sometimes people may feel irritable or “ragey” on T. This can be a part of going through a second puberty, and will improve over time. However, if it becomes a problem for you and your family to handle, let us know. We may check levels to find a dose that feels right for you.

Ok, I want these Hormones. What needs to happen?

As per the World Professional Association for Transgender Health (WPATH) and Endocrine Society Guidelines, a mental health professional needs to write a letter of readiness for anyone wanting to start HRT. Once we have that letter, here is the typical sequence of events:

1. If you are new to T Clinic, you will have an intake visit with Clancy, our Behavioral Health Clinician. During this visit, Clancy will learn about where you are in your gender journey, and what your goals for treatment are. Once you sign an ROI (Release of Information) she can contact your mental health provider to obtain the letter of readiness. If you have been established with our clinic, and we have the letter of readiness, move on to #2.
2. Appointment with Medical Provider: review of treatment, side effects and timelines, physical exam if indicated
3. Labs will be obtained at first MD visit, a bone age x ray may be obtained. If the doctor is concerned about your bones, a dexta scan for bone health may be ordered.
4. Once labs come back, and if all looks normal, our RN will schedule you for a first injection visit. During this visit you will sign the informed consent form for starting

Testosterone. You will receive your first shot and be taught how to administer the shots at home. The nurse will check your injection site after several minutes to watch for any allergic reaction.

5. Your prescription for Testosterone and supplies will be called in.
6. You will come back to clinic to see the doctor approximately every 3-4 months in the first year, and then every 6 months, at which time we will:
 - a. Ask questions about your overall health
 - b. Check your vital signs (pulse, blood pressure, weight, height)
 - c. Ask about what you are seeing in terms of physical and emotional changes on your treatment
 - d. Ask about signs and symptoms of the side effects mentioned above
 - e. Recommend timing of blood tests and dose adjustments

Resources:

Excellence for Transgender Health

www.transhealth.ucsf.edu