

A Guide to Masculinizing Hormones

Gender Affirming Care

Hormone therapy is an option that can help transgender people feel more comfortable in their bodies. Like other medical treatments, there are benefits and risks. Knowing what to expect will help us partner to maximize the benefits and minimize the risks.

The binary terms “male,” “female,” “masculine,” “feminine,” “masculinizing” and “feminizing” do not accurately reflect the diversity of people’s bodies or identities. To describe how hormones work, it is helpful to know how testosterone works in non-intersex, non-trans men’s bodies, and how estrogen and progesterone works in non-intersex, non-trans women’s bodies. We keep these binary terms in quotes to emphasize that they are artificial and imperfect concepts.

What are hormones?

Hormones are chemical messengers that tell tissues of the body how to function, when to grow. They regulate many functions, including growth, sex drive, hunger, thirst, digestion, metabolism, fat burning and storage, blood sugar, cholesterol levels and reproduction.

What are sex hormones?

Sex hormones are involved in the development of the vulva and clitoris, or the penis and testicles (external genitals). Sex hormones also affect the secondary sex characteristics that typically develop at puberty (facial and body hair, bone growth, breast growth, voice changes, etc.). There are 3 categories of sex hormones in the body:

- Androgens: testosterone, dehydroepiandrosterone (DHEA), dihydrotestosterone (DHT)
- Estrogens: estradiol, estriol, estrone
- Progestin: progesterone

Generally, people with testicles tend to have higher androgen levels, and people with ovaries tend to have higher levels of estrogens and progestogens.

What is hormone therapy?

Hormone therapy is taking medicine to change the levels of sex hormones in your body. Changing these levels will affect your hair growth, voice pitch, fat distribution, muscle mass and other features that are associated with sex and gender. Masculinizing hormone therapy can help make the body look and feel less “feminine” and more “masculine” — making your body more closely match your identity.

To Learn More

- Adolescent Medicine
206-987-2028
- Gender Clinic Care Navigator
206-987-8319
- Ask your child’s healthcare provider
- seattlechildrens.org

Free Interpreter Services

- In the hospital, ask your nurse.
- From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.

What medicines are involved?

Testosterone (sometimes called “T”) is the main hormone responsible for promoting “masculine” physical traits and is usually used for hormonal “masculinization.” Testosterone works on tissues in your body (such as stimulating growth of your clitoris). Testosterone alone will eventually stop menstrual cycles, but to stop menstrual cycles immediately, there are treatments that can be used to stop your period. Examples are injecting Depo-Provera (a type of progestin) every 3 months, Nexplanon (implant under the skin in the arm), an IUD (intrauterine device), daily pills with or without estrogen.

How do you take it?

Testosterone can be taken in different ways:

- Injection (subcutaneous application)
- Skin patch, cream or gel (transdermal application)

What are the differences in the ways to take it?

The way you take testosterone seems to affect how fast the changes happen. Using a patch, cream or gel takes slightly longer than injection to make menstrual periods stop and to make facial and body hair grow. Using a skin patch, cream or gel to take testosterone means a steady level in your blood. With injection, there is a peak right after injecting and a dip at the end of the injection cycle. This can increase side effects at both ends of the cycle (aggression/mood swings when testosterone peaks, and fatigue/irritability/mood swings when testosterone dips). This can be reduced by injecting once a week instead of every other week, or by switching to a skin patch, cream or gel.

What is a typical dose?

Testosterone therapy varies greatly. Deciding what to take depends on:

- Your health (each type of testosterone has different risks and side effects)
- What is available where you live
- What you can afford (what your insurance covers)
- How your body reacts when you start taking testosterone (every person is different, and some people have a negative reaction to a specific kind of brand or formulation)
- Your gender goals

We will partner with you to explore your insurance coverage and any other resources to make sure you get the care you need.

The right dose or type of testosterone for you may be different than for others. It is a good idea to talk about the different options with your Gender Clinic healthcare team. If you have any concerns about being able to take the testosterone, or about the side effects, costs or health risks, let us know. It is important that your needs and concerns be taken into account when planning your hormone therapy.

You may need to start on a lower dose if you have not experienced any puberty, have chronic health problems, are at risk for specific side effects or have had your ovaries removed. If you have questions about the reasons for your dose, talk with us.

Every person is different in terms of how their body absorbs, processes and responds to sex hormones. Some people have more changes than others.

Changes happen more quickly for some people than others. Taking more testosterone than the dose you were prescribed — or taking another kind of steroid as well as testosterone (sometimes called “stacking”) — can greatly increase your health risks. Extra testosterone in your body can be converted to estrogen. If you think your dose is too low, talk with us to discuss your options.

If you have your ovaries removed in the future, you may need a different dose of testosterone. To maintain the full effects of testosterone, you will need to stay on testosterone or another form of medicine for the rest of your life (unless you choose to go off of it). Most people will stay on the medicine. In addition, to preserve bone strength, your doctor

What changes can I expect?

Masculinizing hormone therapy has physical and psychological benefits. Bringing the mind and body closer together eases gender dysphoria and can help you feel better about your body. People who have had gender dysphoria often describe being less anxious, less depressed, calmer and happier when they start taking hormones. For some people, this psychological change happens as soon as they start taking hormones. For others, it happens a bit later as physical changes progress. Each person changes differently. How quickly changes appear for you depend on:

- Your age
- The number of hormone receptors in your body
- How sensitive your body is to testosterone

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

Average timeline	Effect
After 1 to 3 months	<ul style="list-style-type: none">• Increased sex drive• Vaginal dryness• Growth of your clitoris (typically 1 to 3 cm)• Increased growth, coarseness and thickness of hairs on arms, legs, chest, back and abdomen• Oilier skin and increased acne• Increased muscle mass and upper body strength• Redistribution of body fat (more around waist and less around hips)
After 1 to 6 months	<ul style="list-style-type: none">• Menstrual periods stop
After 3 to 6 months	<ul style="list-style-type: none">• Voice starts to crack and drop (can take up to a year to finish changing fully)
Gradual changes (usually takes at least 1 year)	<ul style="list-style-type: none">• Gradual growth of facial hair (usually takes 1 to 4 years to reach full growth)• Possible “male”-pattern balding

Most of the effects of hormones happen in the first 2 years. During this time, the doctor who prescribes your testosterone will want to see you every 2 to 3 months. This will continue until the dose that is best for you gets figured out and blood tests show you are at consistent level. After that, you will need an appointment once a year until you are 21 years old. When you are 21 years old or when you are at a stable maintenance dose and ready to switch to an adult provider, you will transition to a provider who can continue your treatments as an adult. For information about moving to an adult health care provider visit: seattlechildrens.org/TransitioningToAdultHealthcare.

- At appointments in the first 2 years, your doctor will likely:
- Look at your facial and body hair. If you shave, the doctor will ask how quickly your hair grows back.
- Ask about changes to your sex drive, clitoris or other sexual changes; menstrual period, skin and voice.
- Order blood tests check your hormone levels.
- Ask how you feel about the changes that have happened.

After 2 years have passed, you will likely just be asked if you notice any further changes from the hormones.

Are the changes permanent?

Most of the changes you will notice from the testosterone are not fully reversible, even if you stop taking testosterone.

- **Permanent (not reversible):** deeper voice, hair growth. “Male”-pattern baldness may or may not happen, based on your family history.
- **May or may not reverse:** clitoral growth, body and facial hair will decrease but usually does not completely disappear, the ability to get pregnant
- **Reversible:** menstrual periods will return and changes to fat, muscle and skin will reverse

Fertility

The long-term effects of testosterone on fertility are not fully understood. The ability to get pregnant **may not come back** even if you stop taking testosterone. Although testosterone can permanently affect your fertility, there may still be a chance you could get pregnant even after starting hormone therapy. **Depending on how you have sex, you may need to use birth control.**

What will not change?

Body image

Many people experience an increase in self-esteem and confidence as their body changes with hormones. You might find that there are also unrealistic societal standards after hormone therapy. It can be hard to separate gender dysphoria from body image problems. Professional and peer counseling can help you sort through your expectations about your appearance and work toward self-acceptance.

Mental health

Many people experience positive emotional changes from hormone therapy, including decreased gender dysphoria. Hormone therapy might help you to become more accepting of yourself, but life can still present emotional and social challenges. Biological factors, stresses of transphobia and unresolved personal issues can also affect your mental health. It is important to continue to access counseling, medication and other supports as needed for your mental health.

Your community

Some people hope that they will find greater acceptance after they make physical changes. Seek support from people and communities who accept and respect you as your body, gender identity and expression evolve. It can be helpful to connect with other transgender people, while remembering that no one will exactly mirror your own experience, identity and beliefs. It can be common to feel lonely and alone after starting hormone therapy. Having a support network to turn to can help.

Your body shape

Hormone therapy will not change some physical characteristics, and some are only slightly changed. These include aspects of your body that develop before birth (vagina, sex chromosomes, etc.) and also physical characteristics that developed from the increase in estrogen at puberty.

Your speech patterns

Although testosterone typically makes your voice pitch drop to deeper levels, it does not change intonation and other speech patterns that are associated with gender socialization. Some people find that speech therapy can help. Speech therapy can also be useful if your pitch does not drop as much as you wanted.

Breast tissue

Testosterone may slightly change the shape of your chest by increasing muscle mass and decreasing fat. However, it does not make breast tissue go away. Some people have “top surgery,” a surgery to remove breast tissue and reshape their chest.

Bone structure

Once your bones have stopped growing after puberty, testosterone cannot change the size or shapes of your bones. There are no treatments you can take to increase your height or the size of your hands and feet.

Pregnancy and sexually transmitted infections

Although testosterone can permanently affect your fertility, there may still be a chance you could get pregnant even after starting hormone therapy. **Depending on how you have sex, you may need to use birth control.** It is also important to note that testosterone could cause some potential harm to a fetus and current guidelines advise against taking testosterone during pregnancy.

Testosterone does not decrease the risk of HIV and sexually transmitted infections. Depending on how you have sex, you may need to use condoms, gloves or other latex barriers. Testosterone tends to make the genital tissue dryer and the cervix more fragile, so if you have frontal or vaginal sex you should add extra lubricant to avoid breaking latex or tearing your tissue.

What are the risks?

The long-term safety of testosterone is not fully understood. Most of the studies on hormone therapy involve non-trans men taking testosterone at different doses. There may be long-term risks that are not yet known.

Heart disease, stroke and diabetes

Testosterone can increase the risk of heart disease, stroke and diabetes. Testosterone tends to:

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

The increase in the amount of red blood cells and hemoglobin is usually remains in the same range as someone who was assigned male at birth (which does not pose health risks). Occasionally, a higher increase can happen and can lead to life-threatening problems, like stroke and heart attack. You will have regular blood tests to check red blood cell and hemoglobin levels.

The risks are greater for people who smoke, are overweight or have a family history of heart disease. Your risk of heart disease, stroke and diabetes can be reduced by creating a care plan that is specific to you. A care plan includes regular blood tests and optimizing contributing factors. These include not smoking, exercising and eating well.

Headaches and migraines

Some people get headaches and migraines after starting testosterone. If you are getting more frequent headaches or migraines or the pain is unusually bad, talk to your primary healthcare provider.

Cancer

It is not known if testosterone increases the risks of breast cancer, ovarian cancer or uterine cancer. These types of cancer are all sensitive to estrogen, called estrogen-dependent cancer. Some testosterone is converted to estrogen so your body will have estrogen even if you don't have ovaries. You are at higher risk of estrogen-dependent cancer if you have a family history of these types of cancer, are age 50 or older or are overweight. Talk with us about screening tests available for these types of cancer.

Mental health

There are often positive emotional changes from reduced gender dysphoria. However, in some people testosterone can cause increased irritability, frustration and anger. There are reports of testosterone destabilizing people with bipolar disorder, schizoaffective disorder and schizophrenia. Taking testosterone via skin patch or cream/gel (transdermal application) can be helpful if the mood swings are linked to the highs and lows of an injection cycle.

Social repercussions

Being a person in a transphobic society can have social risks. Some people experience violence, harassment and discrimination, while others have lost support of loved ones. If you are worried about how others might react to the changes that come with hormone therapy, counseling can be useful. If you are looking for a therapist, see "How to Find a Therapist."
seattlechildrens.org/pdf/PE2195.pdf.

How do I get the most benefit and minimize risks?

You can help make hormone therapy as effective and safe as possible. Here are steps you can take:

- **Be informed.** Understanding how hormones work, what to expect, and possible side effects and risks will give you the tools to be in charge of your health and make informed decisions. Do your own research and ask questions. To get started, see "Gender Clinic Booklist and Resources"
seattlechildrens.org/pdf/PE2634.pdf.
- **If you smoke, stop or cut down.** Any smoking greatly increases the risks of taking hormones. If you are a smoker, your testosterone level may be kept low. If you need help to quit smoking, we can help you develop a plan or direct you to resources. You can contact QuitNow quitnow.net/Program/ as a first step. If you are not quite ready to quit, consider cutting down. Every little bit helps.
- **Find a healthcare provider you trust and can be honest with.** To get the most from hormone therapy, you need to be able to talk openly about what you want, concerns you have and problems you are experiencing. You should feel comfortable to talk openly with your healthcare provider about your health history, smoking, alcohol, street drugs, dietary supplements, herbs and any other medicines you are taking. The risks associated with taking testosterone can be affected by all of these things. Being honest about them will help your healthcare providers to create a hormone plan that is right for you.
- **Deal with problems early on.** If caught early enough, most of the problems that can result from testosterone can be dealt with in a creative way that

does not involve stopping testosterone treatment completely. Waiting to talk with your provider can make the problem worse.

- **Do not change medicine on your own.** Check with your healthcare provider if you want to start, stop or change the dose of any of your medicines. Taking testosterone more often or at a higher dose than prescribed increases health risks and can slow down the changes you want. If you want to make changes, talk with your provider first.
- **Take a holistic approach to your health.** Health involves more than just hormone levels. Taking hormones is only one way for you to improve your quality of life. Building a circle of care that includes health professionals, friends, partners and other people who care about you will help you to deal with problems as they come up. This support will help you to heal from societal transphobia.
- **Know where to go for help.** The Seattle Children's Gender Clinic can help you find information on health and transition issues. We can also help you connect with support groups and community resources. We can help with referrals if you need assistance finding other medical providers, counselors or another type of health professional.

How often do I need to come in for appointments?

As long as you are taking testosterone (possibly for the rest of your life), you will need to have regular physical exams and lab tests to monitor your overall health. The first year after starting testosterone, the doctor who prescribes your hormones will want to see you at least every 3 months; after that, you will have appointments at least every 6 months.

What will happen at appointments?

At every appointment, we will:

- Ask questions about your overall health.
- Ask questions about your mood.
- Take your blood pressure and check your weight and your heart rate.
- Check for early warning signs of health problems that can be caused by testosterone or made worse by testosterone (e.g., heart disease, diabetes).
- Recommend blood tests to check your blood sugar, blood fats, blood cells and liver health.
- Recommend other tests (e.g., bone scan, heart stress function test) as needed, depending on your health history, age, and any signs of possible health problems.

To check for early signs of cancer, as part of the physical exam, your doctor or nurse will do breast and cervical screening tests starting at 21 years old.

While gender healthcare training for providers emphasizes the need to be creative and stopping hormones only as a last resort, there are some health problems that make it dangerous to take testosterone, such as uncontrolled heart disease. If your healthcare provider suspects you have one of these health problems, we will try to control it through medical treatment and changes to your diet or exercise routine. If the condition cannot be controlled, your provider may switch you to another type of hormone, or reduce or stop your dose until your other health problems can be controlled.

Resources

Masculinizing Hormone Therapy at Seattle Children's (video, 3:37)
youtu.be/dmjSEf2og1A

Excellence for Transgender Health
transhealth.ucsf.edu