

A Guide to Gender Affirming Hormone Therapy with Estrogen

Hormone therapy is an option that can help transgender and gender diverse 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.

To describe how hormones work, it is helpful to know how testosterone works in people with testes, and how estrogen and progesterone work in people with ovaries.

What are hormones?

Hormones are chemical messengers that tell tissues of the body how to function, when to grow, when to divide and when to die. 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 penis and testicles, or the vulva and clitoris (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. Gender affirming hormone therapy with estrogen can help make your body more closely match your gender identity.

To Learn More

- Adolescent Medicine - 206-987-2028
- 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?

There are different kinds of medicines used to change the levels of sex hormones in your body. These medicines work by affecting:

- The part of your brain that stimulates sex hormone production
- Your testicles (which produce testosterone)
- The cells in your body that respond to sex hormones

Usually, hormone therapy for individuals with testes involves:

- Estrogen
- A medicine to block testosterone
- Sometimes a progestin is added

Estrogen

Estrogen works directly on tissues in your body to develop some physical traits (such as breasts). Estrogen also indirectly reduces testosterone. Estrogen can be taken by:

- Pill (oral or under the tongue)
- Skin patch (transdermal)
- Injection (intramuscular or subcutaneous)

There are different formulations of estrogen. Your healthcare provider will talk to you about the different kinds and what is right for you.

Androgen blockers

Androgen-blockers work by blocking testosterone. They are also known as anti-androgens or androgen antagonists. They reduce physical traits associated with testosterone. For example, they will help slow “male” pattern baldness, reduce growth of facial hair and have less instances of waking up with an erection or spontaneously having an erection.

There are different types of androgen blockers. The one most typically prescribed is spironolactone. Androgen blockers are often prescribed in addition to estrogen because they have effects that complement each other. Taking androgen blockers reduces the amount of estrogen you need to get the same effects, which minimizes the health risks associated with estrogen. Androgen blockers can be prescribed alone for people who want to reduce testosterone’s effects for a more androgynous appearance.

Progestins

There are mixed opinions about using progestins for hormone therapy. If progestins are used, they are usually started after the person has been on estrogen therapy for at least 2 years.

Some gender clinic programs choose not to use progestins due to the lack of clear evidence that they facilitate puberty-related changes such as breast development. Progestins also have known side effects (which include depression and weight gain).

However, progestins may be used in the following situations:

- If estrogen alone is not working well, even at the maximum dose.
- To promote nipple and breast development (but there is not strong evidence for this).

As with estrogen and androgen blockers, balancing possible risks and benefits of progestins is a decision between you and your healthcare providers.

What is a typical dose?

Hormone therapy varies greatly from person to person. There is no right hormone combination, type, or dose for everyone. Deciding what to take depends on your health because each hormone therapy has different risks and side effects. What your healthcare provider prescribes depends on what is available locally and on what is covered by your insurance.

The dose can change based on how your body reacts when you start taking hormones — everyone's body is different. Usually, hormone therapy is started at lower doses and the dose is increased over time.

The right dose or type of medicine for you might not be the same as for someone else. It is a good idea to discuss the advantages and disadvantages of different options with your healthcare provider. If you have any concerns about being able to take the medicines — or about the side effects, cost or health risks — let us know. We take your needs and concerns into account when planning your hormone therapy.

In prescribing a specific medicine and dose, we consider your overall health, including any other medicines you are taking. Every person is different — each body absorbs, processes and responds to sex hormones differently.

Some people show more changes than others. Changes happen more quickly for some than others.

Taking more hormones than the dose you were prescribed will not speed up changes. Taking more than your prescribed dose greatly increases your health risks.

If you think your dose is too low, talk with us to discuss your options. It might be better to try a different type of medicine or a combination of medicines, rather than increasing the dose.

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

What changes can I expect?

Hormone therapy has important physical and psychological benefits. Bringing 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 more physical changes appear.

Each person changes differently. How quickly changes appear for you depend on:

- Your age
- The number of hormones receptors in your body
- The way your body responds to the medicine

There is no way to know how your body will respond before you start hormones.

Estrogen

Taking estrogen has stronger physical effects compared to androgen blockers. These changes are caused by the estrogen's effect on cells in your body that have estrogen receptors. Taking estrogen also has an indirect effect of suppressing testosterone production. Like androgen blockers, estrogen affects the whole body. You cannot pick the changes you want.

Average timeline	Effect
After 1 to 6 months	<ul style="list-style-type: none">• Softening of skin• Less muscle mass and more body fat• Redistribution of body fat to be more on breasts and hips• Possible decrease in sex drive• Fewer instances of waking up with an erection or spontaneously having an erection. Some people also have difficulty getting an erection even when they are sexually aroused.• Decreased ability to make sperm and ejaculatory fluid
Gradual changes (maximum changes after 2 to 3 years)	<ul style="list-style-type: none">• Nipple and breast growth• Slower growth of facial and body hair• Slowed or stopped "male" pattern balding• Smaller testicles

Breast and nipple growth starts early but is usually gradual. It can take 2 years or more for breasts to reach their maximum size. As with all people, there is a range in how large breasts grow. In many cases, your breasts might not grow beyond an A or B cup size. If you are not happy with the size of your breasts after 2 years on estrogen, progestins may be added to increase breast growth. Some people also consider surgical breast augmentation. The implants will look most natural if you wait to get as much breast growth as you can from hormones first.

Most of the effects of hormones happen in the first 2 years. During this time, the doctor who prescribes your hormones will usually want to see you every 3 months. This is to check if the hormones are working properly. After that, you will probably need an appointment every 6-12 months. At appointments in the first 2 years, your doctor will likely:

- Ask about your facial and body hair and how quickly your hair grows.
- Ask about changes to your sex drive, erections, or other sexual changes.
- Ask about breast growth or nipple changes
- Order blood test to see what your hormone levels are.
- Ask how you feel about the changes that have happened so far.

After 2 years, your doctor will monitor the effects by asking if you notice any more changes from the hormones. When you are 18 years old, you will transition to a medical provider who can continue your treatments as an adult. For information about moving to an adult healthcare provider, visit seattlechildrens.org/TransitioningToAdultHealthcare.

Androgen blocker (spironolactone) without estrogen

Taking spironolactone (the most common androgen blocker) without estrogen has small effects. The changes are caused by the medicine blocking the effect of testosterone in your body. Most of the changes are reversible, which means if you stop taking it, your body will go back to how it was before you started taking the medicine. Androgen blockers affect the whole body. You cannot pick the changes you want.

Average timeline	Effect
After 1 to 3 months	<ul style="list-style-type: none">• Decreased sex drive• Fewer instances of waking up with an erection or spontaneously having an erection. Some people also have difficulty getting an erection even when they are sexually aroused• Decreased ability to make sperm and ejaculatory fluid
Gradual changes (usually takes at least 2 years)	<ul style="list-style-type: none">• Slower growth of facial or body hair• Slowed or stopped “male”-pattern balding• Slight breast growth (reversible in some cases, not in others)

Are the changes permanent?

Some of the changes you will notice from the hormone therapy with estrogen are not permanent. If you stop taking the medicine, some of the changes will stop and your body will return to how it was before you started the hormones. There are 2 types of changes that may be permanent:

- Breast growth
- Fertility

Breast growth

If you are taking an androgen blocker (spironolactone) without estrogen because you do not want visible changes, you might see some breast growth. This growth happens slowly, so you can stop taking it if you do not want breast growth. Breast growth from spironolactone is usually small and reversible. But in some people, the breast tissue remains even after the spironolactone is stopped.

Estrogen causes permanent nipple development and breast growth. Even if you stop taking estrogen, the breast tissue will not go away and your nipples will not shrink.

Fertility

Both androgen blockers and estrogen affect your production of sperm, which means you may have trouble having biological children after taking them. It is also important to know that we do not yet fully understand the long-term effects hormone therapy has on fertility. If you stop taking hormones, your ability to make sperm may or may not return to what it was before you started.

If you are interested in fertility preservation, we strongly recommend that you talk about options for sperm banking before starting hormone therapy. If you have already started hormones, you can work with your doctor to stop the hormones, give sperm samples, and store them if they are viable. Then you could go back on hormones. Start by reading our handout “Fertility Preservation for Gender Diverse Youth and Young Adults” at seattlechildrens.org/pdf/PE3359.pdf.

Although androgen blockers and estrogen affect sperm production, there may still be a chance you could make someone pregnant after starting hormone therapy. Depending on how you have sex, you may need to use birth control.

Hormone therapy does not lower your risk of HIV and other sexually transmitted infections. Depending on how you have sex, you may need to use condoms, gloves or other latex barriers. Hormone therapy can make erections less firm, increasing the risk of condom leakage. In this situation, your partner can use a special condom they put inside their anus or vagina. They are called “female condoms,” but can be used by people of any gender.

What are the risks?

Although estrogen is a common gender affirming treatment for adults, using this treatment in younger adolescents is a newer development. The long-term effects are not fully known, though recent studies have been reassuring about the safety of estrogen in adolescents and young adults.

We can lower many of the known risks of hormone therapy by avoiding hormone levels that are too high. There are also actions you can take to reduce the risks, including:

- Not smoking. This is the best thing you can do to reduce your risk of blood clots and heart disease. Even the occasional smoker is at an increased risk.
- Having your blood tested as recommended by your doctor.

Side effects

- **Nausea and vomiting**
- **Headaches and migraines:** People with a history of migraines may want to begin therapy at lower estrogen doses and increase doses slowly. Please talk with your provider if you develop new or different migraines after starting estrogen, or if you have a history of migraines with aura.
- **Galactorrhea:** An increase in milky discharge from the nipples caused by the estrogen stimulating the production of the hormone prolactin, which stimulates breast ducts to make milk.
- **Skin rash:** The skin patch (transdermal application) of estrogen can sometimes cause a skin rash. If this happens, contact us.

Blood clots

Taking estrogen increases the risk of blood clots. Blood clots can cause death, permanent lung damage (clot in the lungs), permanent brain damage (stroke), heart attack or chronic problems with veins in your legs. The risk of blood clots is much higher for if you smoke.

The risk of blood clots is higher when a person uses nicotine, is over 40 years old, or has a history of blood clots. It is recommended to stop smoking and vaping completely if you start taking estrogen. Your medical provider can provide you with advice about options to stop smoking or vaping. There is evidence that estrogen used for gender affirmation has less risk of blood clots than that in the birth control pill, and some types of estrogen (transdermal/patch) have no increased risk of blood clots. If you have nausea or vomiting, or frequent headaches or migraines for more than a couple of days, call a healthcare professional.

Breast cancer

It is not known if estrogen causes an increased risk of breast cancer. There have been cases of people who have developed breast cancer after hormone therapy for gender affirming care. Talk with your healthcare provider about screening tests that can be done to catch early signs of breast cancer. Your breast cancer risk is higher if you:

- Have a family history of breast cancer
- Have been taking estrogen or progestin for more than 5 years
- Are 50 years or older
- Are overweight

Long-term risks

The long-term effects of estrogen on chronic disease risk (including high cholesterol, high blood pressure, diabetes, heart disease) is still being researched, and recent studies have been reassuring.

Some studies have shown small changes to one of the types of cholesterol (decrease in LDL), decreased insulin resistance, and decreased blood pressure. However, these changes have not been known to be clinically significant.

The risk for some chronic diseases (such as diabetes, high blood pressure, or high cholesterol) involve both a genetic component and a hormonal influence. When you take estrogen, you have the same genetic risk for these chronic diseases however you will have the influence of estrogen instead of testosterone on this risk.

Spironolactone risks

Spironolactone (the most common androgen blocker) affects the balance of water and salt in the kidneys. The most common side effect of this is an increase in urination. If the amount of water and salt gets out of balance, you can have problems with low blood pressure. Rarely, this imbalance can lead to high levels of potassium in your body, which can cause changes in heart rhythm that can be life-threatening. Your blood tests will check your potassium levels and kidney function on a regular basis. This is especially important if you:

- Have a history of kidney problems
- Are taking medicine that can raise blood potassium (ask your doctor or pharmacist)
- Are taking ACE-inhibitors (commonly prescribed for people with high blood pressure or heart problems).

If you receive care from another healthcare provider, tell them you are on hormone therapy, so you do not take these kinds of medicines unknowingly.

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 our handout “How to Find a Therapist” at 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” at seattlechildrens.org/pdf/PE2634.pdf.
- **If you smoke, stop or cut down.** Any smoking greatly increases the risks of hormone therapy. If you are a smoker, your estrogen 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 at 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. Hormone therapy can be affected by all of these things. Being honest with your healthcare provider will help the provider 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 hormone therapy can be dealt with in a creative way that does not involve stopping hormone therapy. 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 medicine more often or at a higher dose than prescribed increases health risks and can slow down the changes you want. If you want to change your medicine, talk with your provider first.

- **Take a holistic approach to your health.** Health involves more than just hormone levels, and 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.

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

Hormone therapy does not affect some parts of the body. Some changes are very small. Parts of the body that will not change:

- Penis
- Sex chromosomes
- Adam's apple
- Bone structure
- Voice pitch
- Height

Hormone therapy can make facial and body hair grow more slowly and be less noticeable, but hair will not go away completely. Some people get laser treatment or electrolysis to get rid of facial hair. Laser hair removal works best if you have light skin and dark hair. Electrolysis destroys the follicle that the hair grows out of, so it is permanent hair removal. Electrolysis works for all people.

While “male” pattern baldness may slow down or stop, bald areas will not grow hair again. Some people use wigs or hairpieces, hair transplants or other medical treatments, like Minoxidil (Rogaine).

Hormone therapy does not change how high or low your voice is (pitch). Hormone therapy will not change your speech patterns. Speech therapy can help change pitch and other aspects of speech associated with gender. Some people have surgery on their vocal cords or the surrounding cartilage to try to make their voice sound higher.

Once your bones have stopped growing after puberty, hormone therapy with estrogen cannot change the size or shape of your bones. Some people use facial surgery to change the shape of the skull and facial features, and to reduce a prominent Adam's apple. After puberty, there are no treatments you can take to change your height or the size of your hands and feet.

How often do I need to come in for appointments?

You need regular physical exams and lab tests to monitor your overall health while you are on hormone therapy. The first year after starting hormones, this will be at least every 3 months.

What will happen at appointments?

At every appointment, we will:

- Ask questions about your overall health
- Check your blood pressure and your weight
- Look at your arms, legs, hands and feet to check your overall circulation and look for any signs of swelling, fluid retention or pain
- Check blood test results (usually blood tests are done before your appointment)
- Recommend other tests as needed, depending on your health history, age and any signs of possible health problems
- Starting at age 40, but also depending on your age, family history and other risks for breast cancer, you may need an examination of your breast tissue (mammogram). When you are over 50, your healthcare provider should discuss checking for prostate cancer if you have a prostate.

Resources

Feminizing Hormone Therapy at Seattle Children's (video, 3:12)
youtu.be/8_gdLCXKI5Y

Excellence for Transgender Health
transhealth.ucsf.edu