

Feminizing Hormone Therapy

ADAPTED FROM: Overview of Feminizing Hormone Therapy, adapted from UCSF Gender Affirming Health Program, UCSF Health System, University of California - San Francisco MARCH 2025

The below information is required reading before you can begin hormone therapy. Please take notes and make a list of questions to bring with you to your next visit. You should also re-read this within 24 hours of your visit so the information is fresh in your mind when we meet. Your reading and understanding this material is an important component in the informed consent process for receiving a hormone prescription.

In this document I will review various aspects of feminizing hormone therapy, including, choices, risks, and unknowns associated with feminizing hormone therapy.

As you prepare to begin treatment, now is a great time to think through what your goals are. Do you want to get started right away on a path to the maximum degree of medically appropriate feminizing effects? Or, do you want to begin at a lower dose and allow things to progress more slowly? Perhaps you are seeking less-than-maximal effects and would like to remain on a low dose for the long term. Thinking about your goals will help you communicate more effectively with your medical provider as you work together to map out your care plan.

Many people are eager for hormonal changes to take place rapidly – which is totally understandable. It is important to remember that the extent of, and rate at which your changes take place, depend on many factors. These factors primarily include your genetics and the age at which you start taking hormones.

Consider the effects of hormone therapy as a second puberty, and puberty normally takes years for the full effects to be seen. Taking higher doses of hormones will not necessarily bring about faster changes, but it could endanger your health. And because everyone is different, your medicines or dosages may vary widely from those of your friends, or what you may have seen on YouTube, or read in books or in online forums. Use caution when reading about hormone regimens that promise specific, rapid, or drastic effects. While it is possible to make adjustments in medications and dosing to achieve certain specific goals, in large part the way your body changes in response to hormones is more dependent on genetics and the age at which you start, rather than the specific dose, route, frequency, or types of medications you are taking.

While this guide reviews the approach to hormone therapy in transgender women, content is also applicable to and inclusive of non-binary people who were assigned male at birth and considering feminizing hormone therapy.

There are four areas where you can expect changes to occur as your hormone therapy progresses. Physical, emotional, sexual, and reproductive.

The first is physical.

Physical

The first changes you will probably notice are that your skin will become a bit drier and thinner. Your pores will become smaller and there will be less oil production. You may become more prone to bruising or cuts and in the first few weeks you'll notice that the odors of your sweat and urine will change. It's also likely that you'll sweat less. When you touch things, they may "feel different" and you may perceive pain and temperature differently.

Probably within a few weeks you'll begin to develop small "buds" beneath your nipples. These may be slightly painful, especially to the touch and the right and left side may be uneven. This is the normal course of breast development and whatever pain you experience will diminish significantly over the course of several months.

It's important to note that breast development varies from person to person. Not everyone develops at the same rate and most transgender women who begin hormone therapy after puberty, even after many years of treatment, can only expect to develop an "A" cup or perhaps a small "B" cup. As with all other women, the breasts of transgender women vary in size and shape and will sometimes be uneven with each other. It is usually a good idea to wait until you have been on hormones for at least a year before pursuing breast augmentation surgery.

Your body will begin to redistribute your weight. Fat will collect around your hips and thighs and the muscles in your arms and legs will become less defined and have a smoother appearance as the fat just below your skin becomes a bit thicker. Hormones may not have a significant effect on the fat in your abdomen, also known as your "gut". You can also expect your muscle mass and strength to decrease. To maintain muscle tone, and for your general health, I recommend you exercise. Overall, you may gain or lose weight once you begin hormone therapy, depending on your diet, lifestyle, genetics and muscle mass.

Your eyes and face will begin to develop a more feminine appearance as the fat under the skin increases and shifts. Because it can take two or more years for these changes to fully develop, it is a good idea to delay a decision on seeking facial feminization surgery until you have been on hormone therapy for at least 1 year. What won't change is your bone structure, including the bones of your face as well as your hips, arms, hands, legs and feet.

The hair on your body, including your chest, back and arms, will decrease in thickness and grow at a slower rate. But it may not go away all together, and some may choose to pursue electrolysis or laser treatment. Remember that all cisgender women also have some body hair. Your facial hair may thin a bit and grow slower but it will rarely go away entirely without electrolysis or laser treatments. If you have had any scalp balding, hormone therapy will usually stop it, however the extent to which it will grow back is variable.

Some people may notice minor changes in shoe size or height. This is not due to bony changes, but due to changes in the ligaments and muscles of your feet and spinal column.

Feminizing hormone therapy does not have any effect on voice pitch or character. For those of you seeking to modify your speaking voice, I recommend you consult with a speech and language specialist who has expertise in this area.

Emotional state changes

The second area of impact of hormone therapy is on your emotional state.

Your overall emotional state may or may not change, this varies from person to person. Puberty is a roller coaster of emotions, and the second puberty that you will experience during your transition is no exception. You may find that you have access to a wider range of emotions or feelings, or have different interests, tastes or pastimes, or behave differently in relationships with other people. For most people, things usually settle down after a period time. I encourage you to take the time to learn new things about yourself, and sit with new or unfamiliar feelings and emotions while you explore and familiarize yourself with them. While psychotherapy is not for everyone, many people find that working with a therapist while in transition can help you to explore these new thoughts and feelings, get to know your new body and self, and help you with things like coming out to family, friends, or coworkers, and developing a greater level of self-love and acceptance.

Sexual changes

The third impact of hormone therapy is sexual in nature.

Soon after beginning hormone treatment, you will notice a decrease in the number of erections you have; and when you do have one, you may lose the ability to penetrate, because it won't be as firm or last as long. You will, however, still have erotic sensations and be able to orgasm. For those who are concerned about reduced erections, medications such as sildenafil (Viagra) may be helpful.

You may find that you get erotic pleasure from different sex acts and different parts of your body. Your orgasms may feel like more of a "whole body" experience and last longer, but with less peak intensity. You may experience ejaculation of a small amount of clear or white fluid, or perhaps no fluid. Don't be afraid to explore and experiment with your new sexuality through masturbation and with sex toys such as dildos and vibrators. Involve your sexual partner if you have one.

Though your testicles will shrink to less than half their original size, most experts agree that the amount of scrotal skin available for future genital surgery won't be affected.

Reproductive system changes

The fourth impact of hormone therapy is on the reproductive system.

The impact of feminizing hormone therapy on fertility is unclear. While some data suggest that stopping hormones for 3-6 months can allow sperm counts to return, it is best to assume that within a few months of starting hormone therapy you could permanently and irreversibly lose the ability to create sperm. Some people may maintain a sperm count on hormone therapy, or have their sperm count return after stopping hormone therapy, but it is best to assume that won't be the case for you.

If there is any chance you may want to parent a child from your own sperm, speak with your medical provider about preserving your sperm in a sperm bank. This process generally takes 2-4 weeks and costs roughly \$2000-\$3000. It is best to store your sperm before beginning treatment, to avoid any risk of reduced sperm count due to hormone therapy that could impact your ability to conceive a child. Storing sperm in advance also avoids the stress of having to stop hormones at a later time to allow testosterone

levels and sperm counts to come up; often this involves a return of some masculine characteristics during the time off of hormones.

On the flip side, because feminizing hormone therapy does not always lower sperm count, if you are sexually active with someone who is able to become pregnant, you should always continue to use a birth control method to prevent unwanted pregnancy.

Risks

The risk of things like blood clots, heart attacks, strokes, diabetes, and cancer as a result of hormone therapy are minimal, but may be elevated, especially for those with co-existing health conditions or starting hormone therapy after age 50. Generally, the size of any increase in risk for those in good health is small, and may be offset by improvements in quality of life and reductions in stress levels once they taking hormone therapy has begun. The biggest increase in risk when taking estrogen is when it is combined with cigarette smoking. In this case there is an increased risk of blood clots, and probably strokes and heart attacks. For those with an elevated risk of these conditions, or over the age of 50, forms of estrogen that are delivered through the skin, such as a patch, are generally the safest option.

There is not much scientific evidence regarding the risks of cancer in transgender women. We believe the risk of prostate cancer will go down, but we can't be sure. The risk of breast cancer may increase slightly, but will still be at less of a risk than a non-transgender female. Since there is not a lot of research on the use of estrogen for feminizing treatment, there may be other unknown risks, especially for those who have used estrogen for many years.

In particular for those trans women over the age of 50, it might be appropriate to use testosterone blockers only, or with a lower dose of estrogen. Since most non-transgender women go through menopause with declining estrogen levels at age 50, this approach is similar to the natural female life course, and may be of particular value in those with other health risks.

If your testicles are removed through an orchiectomy or vaginoplasty, you will be able to stop taking testosterone blockers, and may be able to take a lower dose of hormones, but should remain on at least a minimal dose hormones until a minimum age of 50. This will help prevent a potentially severe weakening of the bones, otherwise known as osteoporosis, which can result in serious and disabling bone fractures.

While gender affirming hormone therapy usually results in an improvement in mood, some people may experience mood swings or a worsening of anxiety, depression, or other mental health conditions as a result of the shifts associated with starting a second puberty. If you have any mental health conditions it is recommended you remain in discussion with a mental health providers as you begin hormone therapy.

Other medical conditions may be impacted by gender affirming hormone therapy, though research is lacking. These include autoimmune conditions, which can sometimes improve or worsen with hormone shifts, and migraines, which often have a hormonal component. Ask your medical provider if you have further questions about the risks, health monitoring needs, and other long term considerations when taking hormone therapy.

Modern, healthy approaches to estrogen therapy have no risk of causing liver injury. However, in some cases, the flow of bile from the liver through the gallbladder may be slowed which can lead to an increased risk of gallstones. The degree of this increased risk is small.

Many of the effects of hormone therapy are reversible, if you stop taking them. The degree to which they can be reversed depends on how long you have been taking them. Some breast growth, and possibly reduced or absent fertility are not reversible.

Treatments

Now let's talk about treatments. Feminizing hormone therapy may include three different kinds of medicines: Estrogen, testosterone blockers, and progestones. All gender affirming hormone therapy is "off-label", which means that while the medications used have been approved for use by the US Food and Drug Administration, they have not been approved specifically for gender affirming care. This does not prevent their use for this purpose, and in medicine there are many times that medications are used "off-label". This use is still considered appropriate, and is legal.

Estrogen

Estrogen is the primary “female” hormone. It is involved in many of the physical and emotional changes seen in transition. Estrogen may be given as a pill, by injection, or by a number of skin preparations such as a gel, spray or a patch.

Pills are convenient, cheap and effective, but are less safe if you smoke or are older than 35. Patches can be very effective and safe, but they need to be worn at all times. In a small number of cases they can cause some skin irritation.

Many trans women are interested in estrogen through injection. Estrogen injections tend to cause very high and fluctuating estrogen levels which can cause mood swings, weight gain, hot flashes, anxiety or migraines. Additionally, little is known about the effects of these high levels over the long term. If injections are used, it should be at a low dose and with an understanding that there may be uncomfortable side effects, and that switching off of injections to other forms may cause mood swings or hot flashes. Some trans women have encountered difficulties obtaining a consistent supply of injected estrogen due to ongoing problems with the supplier. Realistically, there is no evidence that injections lead to more rapid or a greater degree of feminization. In my practice, I generally avoid prescribing injections unless under very specific circumstances.

Contrary to what many may have heard, you can achieve the maximum effect of your transition with doses of estrogen that result in your blood levels being similar to those of a pre-menopausal, cisgender woman. Taking high doses does not necessarily make changes happen quicker. It could, however, endanger your health. You may encounter claims of complicated and at times questionable dosing regimens, or intensive monitoring of various blood tests, that make promises of drastic, almost magical effects. High doses of estrogens or other complicated hormonal regimens are not given to cisgender women who are seeking more exaggerated feminine features. In reality, beyond getting your hormone levels into the somewhat wide range of levels seen in pre-menopausal non-transgender women, there is

no evidence at this time to support higher doses or complex regimens over straightforward and appropriate dosing schemes, as recommended by the Endocrine Society and our own UCSF Transgender Care Guidelines. The bottom line is that the primary predictor of feminizing effects is likely the lack of testosterone rather than levels of estrogen. Blood tests for estradiol, the most important estrogen in the body, and testosterone will be performed periodically to insure your treatment is aligned with your goals.

Testosterone blockers

Testosterone blockers are otherwise known as anti-androgens. Androgens are the class of hormones that cause male or masculine features. There are a number of medicines that can block testosterone.

Spironolactone is the most commonly used anti-androgen in feminizing hormone therapy. Spironolactone works by both blocking the production of and action of testosterone. Spironolactone can cause you to urinate excessively and feel dizzy or lightheaded, especially when you first start taking it. It's important to remain well hydrated when taking this medication. Potassium levels should be monitored while taking this medication, though elevated potassium levels with spironolactone is very rare and usually only in people with kidney disease or taking certain kinds of blood pressure medication. For people with no history of kidney disease or high potassium levels, there is no need to reduce the amount of potassium in your diet when taking spironolactone. Contrary to what you may read in chat groups or hear from others, spironolactone is a widely used, safe medication that is well tolerated by most. If spironolactone is not tolerable to you, it can be stopped and all of the side effects will resolve; none are permanent. Your medical provider will monitor your blood testosterone level while taking spironolactone to help guide dosing and meet your goals. Spironolactone is taken as a pill, usually twice per day.

A family of medications known as gonadotropin-releasing hormone (GnRH) analogs, such as leuprolide, brand name Lupron, may be used in cases where spironolactone is not appropriate or well tolerated. These medications work at your pituitary gland, and cause it to shut down the signals being sent to your testicles that tell them to make testosterone. These medications are very effective and well tolerated, but can be expensive, and not all insurance plans cover their use. In addition to monitoring your blood testosterone levels while taking this medication, your provider will monitor other tests to insure this medication is being dosed appropriately. In adults, GnRH analogs are most commonly injected, and sometimes taken as a nasal spray. Depending on insurance requirements, in-office injections by a nurse may be necessary.

Bicalutamide is an anti-androgen that some transgender and non-binary people ask about. This medication is typically used in the treatment of prostate cancer. This medication blocks the action of testosterone in cells, but does not block the production of testosterone. Because of this, testosterone levels in the body remain high, and measuring blood testosterone level is not useful for tailoring treatment. This makes it difficult to monitor whether this medication is being optimally dosed. Because bicalutamide has a risk of liver injury and because spironolactone and GnRH analogs like leuprolide are so safe and effective, bicalutamide is not recommended for use as part of a feminizing hormone regimen.

Finasteride and dutasteride are medicines which prevent the production of dihydrotestosterone, a specific form of testosterone that has action on the skin, hair, and prostate. These medicines are weaker testosterone blockers than spironolactone but have but may be useful for those who can not tolerate

spironolactone and are unable to use GnRH analogs. It is unclear if there is any added benefit to taking one of these medicines once your testosterone levels have been reduced into the female range through the use of other blockers. A condition known as "post-finasteride syndrome" has been observed, causing mood and energy symptoms. This rare condition can sometimes persist even after stopping finasteride.

Progesterone

Progesterone is a hormone present in cisgender women that is involved in maintaining balance in the uterine lining and supporting pregnancy. Though it's commonly believed to have a number of benefits, including: improved mood and libido, enhanced energy, and better breast development and body fat redistribution, there is very little scientific evidence to support these claims. Nevertheless, some say they experience some or all of these benefits from progesterone. Progesterone may also be useful as a partial blocker of testosterone production in cases where other blockers can not be used or have not been effective. Progesterone should be used with caution as it can cause mood symptoms such as anxiety, depression, or irritability, and can cause weight gain. Progesterone can have a negative impact on blood cholesterol, though this is usually of minimal significance unless there is a pre-existing and poorly controlled cholesterol or cardiac condition. Progesterone is usually taken as a pill. Generally, progesterone would be added to a regimen after hormone levels have been stabilized after the initial startup period on estrogen and testosterone. Progesterone can cause your hormone levels to go up or down, so hormone labs should be repeated within a few months of starting progesterone.

Final thoughts

Please remember that all of the changes associated with the puberty you're about to experience can take years to develop. Starting hormone therapy in your 40s, 50s, or beyond may bring less drastic changes than one might see when beginning transition at a younger age, due to the accumulated lifetime exposure to testosterone, and declining responsiveness to hormone effects as one approaches the age of menopause. Taking higher doses won't result in faster or more dramatic changes, however they can result in more side effects or complications.

Watch this video: [Informational video on estrogen hormone therapy](#)