Guide to **Hormones**

Your gender transition in your own hands

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Hormones

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By

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Cover photos: VICE

Trans Resources Exchange Nijmegen is a working group of the Transinfo024 Foundation

1. About this book

Being transgender is wonderful! What is not so wonderful is that many trans people do not have access to healthcare. We are faced with years-long waiting lists and requirements that we cannot meet. Or we have no access to healthcare at all because, as refugees, we are excluded from the healthcare system.

Because healthcare, which is vital to us, is often not accessible through official channels, many people seek unofficial routes. They start taking medication themselves to change their bodies. When someone starts doing this without being well informed, it can be risky. When someone knows how healthcare works and what to look out for, there are far fewer risks.

We have written this book to make starting your own healthcare as safe as possible. We have tried to bring together the basic information you need when using hormones to change your body and when making an informed choice about whether or not to start taking hormones yourself.

This book was written by trans people who have faced this challenge themselves. We are not doctors and we are not authorised to give individual medical advice. The information in this book has been compiled from official treatment protocols and other public sources. Everything has been checked by experienced proofreaders, including a doctor who works in transgender care. Not all of the proofreaders' advice has been included, as opinions may differ on some issues.

We have tried to present this information in simple language as much as possible, with (tracking-free) QR codes to sources where you can read more. All medical information, dosages, blood values, etc. are based on care for adults. We have not covered

puberty blockers and the start of hormone therapy in young people.

This book was written by and for trans people in the Netherlands. While a lot of the medical information applies more broadly, information about the health care system is specific to the Netherlands. We name brand names for medications that are available in the Netherlands. When discussing blood tests and dosage, we use the measurement units that are most commonly used in the Netherlands.

We hope this book will help you, but we also hope you will use more information than just this book. We cannot tell you everything there is to know about hormones, and we certainly cannot tell you how to combine this care with other health problems or medications you are taking.

We therefore recommend that you seek out more information and, above all, get in touch with other trans people who have started hormone therapy by themselves. Contact with others who have experience with this can make a big difference in finding safe medication, solving problems you encounter and passing on what you have learned. That is why we begin this book with a list of the groups for self-starters that currently exist in the Netherlands.

We hope that this book can also help people who are not starting hormones by themselves, but would like to know more. For example, family, friends, and partners of trans people.
This book may also be useful for trans people who are prescribed hormones but receive insufficient information from their practitioner. Hopefully, this book can provide more insight into the options and considerations that healthcare providers make about the care they offer. We hope that this will enable readers to better advocate for themselves in conversations with practitioners.

If the readers of this book already know a lot about hormone use, we hope they will help us to make future editions of this book even better. So if you have any additions or comments, please send an email to: treny@riseup.net.

Finally, we would like to thank everyone who contributed to the creation of this book. In particular, we would like to thank the proofreaders: Dr. Peter Leusink (general practitioner, sexologist NVVS, initiator of Transgender Care Utrecht), Denna Sikkema (Trans in Eigen Hand), Marije van 't Kruijs (Ede Pride, Feminists Against Ableism), Michelle den Boer and the Principle17 team. Roos Wilkens created beautiful illustrations for us for the chapter on self-injection. We want to thank the Mama Cash Foundation for their financial support of our organisation. In addition, we are indebted to the organisations that have housed or supported us over the past few years: Café De Klinker, Café De Opstand, meeting place Gezellig Nijmegen, het Roze Huis and COC Regio Nijmegen.

We would also like to thank the trans organisations that have done the groundwork on which we could build, including Trans Radical Resources Exchange (T-RRex), Trans Healthcare Network and Transfeminine Science. It is impossible to name all the organisations and individuals who have contributed, because organisations that are active today build on the work of others. The tradition of supporting each other in self-medication began almost a century ago among marginalised trans people, often sex workers, who helped each other because no one else would. It is an honour to be able to make a small contribution to this history of mutual support with this book.

Information groups for self-starters:
This list is subject to change. Search the internet or ask around in the community for more tips.

Trans Resources Exchange Nijmegen (TRENY)
https://treny.noblogs.org/
https://www.instagram.com/trenymegen/
treny@riseup.nl

Trans Radical Resource Exchange
in The Hague (T-RREx)
https://trrex.noblogs.org/
https://www.instagram.com/trrex_denhaag/
https://radar.squat.net/en/den-haag/t-rrex

Bringing Unity Through Transgender Empowerment, Radiance, Friendship, Laughter, and Yearning in Amsterdam (b.u.t.t.e.r.f.l.y.)
https://butt.erfly.diy/
https://www.instagram.com/butterfly_amsterdam/

Transgender Informational Gathering for the Exchange of Radical Resources | Groningen (Tigerr 050**)**
https://www.instagram.com/tigerr.050/

2. Hormones: on prescription or start yourself?

Gender-affirming hormone therapy involves taking medication to influence the amount of testosterone and estrogen in your body, sometimes supplemented with other substances. In English, this is called *Hormone Replacement Therapy*, which is why you sometimes see the abbreviation **HRT** used in Dutch to refer to gender-affirming hormone therapy.

Many trans people use hormones to help their bodies align better with their gender identity. This can involve visible physical changes, but also how they feel emotionally and mentally.
In this book, and in medical protocols, hormone treatment is divided into two types: masculinising and feminising. In practice, trans people do not always strive to look more masculine or feminine, but rather to achieve changes – visible or not – that make them feel better about themselves.

There are also people who are cisgender (non-transgender) and use HRT. Cisgender women, for example, often use hormones to treat the symptoms of the menopause and for contraception. Cisgender men use it for various health problems resulting from low testosterone. Some people with an intersex condition also use hormones. Hormones are also used to bring about cosmetic changes or improve athletic performance. Whatever the reason and background for taking hormones, it is always a medical treatment that can affect your physical and mental health.

It is not up to us to determine for whom hormones are the right choice, in what quantity, or for what purposes. Starting hormones is a personal choice. In this book, we will not tell you whether you should do this. However, we do want to give you insight into your options.

Advantages and disadvantages of starting on your own

If you want to obtain hormones on prescription for transition care, this is usually (but not always) possible after a long waiting list and extensive psychological assessment. You will then receive a prescription from an endocrinologist or general practitioner. This doctor will determine which medication you take, how often and in what dose. The doctor will prescribe blood tests, check your blood values and adjust your care based on the results. A pharmacy will provide medication that has been manufactured in an approved laboratory according to fixed quality standards. The pharmacy will also check whether the hormones you are receiving could affect other medication you are taking. Your medication will then usually be paid for in full or in part by your health insurance.

If you start taking medication yourself, this system no longer applies. You are your own doctor. You decide which medication you take, how often and in what dose. You arrange blood tests and check your blood values yourself. You are also your own pharmacy: you look for a seller who is willing to sell you medication. In most cases, you cannot check whether your medication has been manufactured in an approved laboratory according to established quality standards. You pay for everything yourself.

The big advantage is that you are not bound by the rules of the system. There are no waiting times, no mandatory psychological assessment and you are not obliged to adhere to treatment protocols. For some people, freedom of choice is the reason they start on their own. Often, the long waiting time for official care is an important reason. Waiting years before you finally feel comfortable in your own body can be very bad for your physical and mental health. Whether or not to start on your own therefore often involves a risk analysis: is the risk of arranging everything

yourself greater than the risk of waiting years for care? And are you willing to reduce the potential risks of starting on your own by informing yourself properly and proceeding with caution?

Your options for obtaining hormones on prescription

There are various ways to obtain hormone care within the Dutch health care system. We will briefly summarise them here. The information below was compiled in 2025 and may change in the coming years.

Through a gender team at a university hospital

There are currently three clinics in Dutch academic hospitals where you can receive transition care: Amsterdam UMC, Radboud UMC and UMC Groningen. To get on the waiting list for these teams, you need a referral from your GP. The waiting time varies, but generally takes several years. This is followed by a psychological assessment (the 'indication assessment'), which takes several months. You will then be referred to an endocrinologist at the same hospital. Often, they also have a waiting list. Due to this lengthy process, it can sometimes take many years before you can actually start hormone therapy. You can also be placed on waiting lists for surgery through a gender team.

Through the gender team of a psychologist's practice

Various gender teams at psychology practices provide a psychological assessment (the ‘indication assessment’). Waiting times for these practices vary and new practices may open while others are discontinued. After the psychological assessment,

these teams refer you to an endocrinologist practice outside their own organisation. They can often also refer you to a surgeon, but sometimes you still have to go to a gender team at a university hospital for this. Health insurers often make it difficult to reimburse care that you receive in this way. It is important to make sure that your health insurer has a contract with the gender team, the endocrinologist and the hospital where the surgeon works.

Tip: The organisation Trans in Eigen Hand keeps track of the waiting lists for gender teams and publishes annual overviews of contracts with health insurers. https://transineigenhand.nl/voor-transgender-personen/overzicht-wachttijden-gender-teams/

Through a GGD trans care clinic

Gender teams are not accessible to refugees without a residence permit. However, they can receive care from the GGD. There are currently trans care clinics at the GGD Amsterdam and the GGD Utrecht. The GGD clinics also have a waiting list, but they do not perform a full psychological assessment. They will interview you and review your health. A GGD doctor will then write you a prescription for hormones. Sometimes you will have to pay for part of your care yourself. You can also receive sexual health care at the clinic, such as STI tests. The GGD clinics help trans migrants, sex workers and people of colour. You do not need a referral from a general practitioner.

Via the COA doctor

Are you a refugee and did you already start hormone therapy before you came to the Netherlands? Then the COA doctor must continue your care. Sometimes it is very difficult to convince the COA doctor that this is necessary care and that you had already started hormones in your country of origin. Support groups for LGBT refugees can help you with tips and support to get the care you are entitled to.

Tip: Contact Colored Qollective, an organisation for and by LGBTQIA+ people of colour,
https://www.coloredqollective.org/
https://www.instagram.com/coloredqollective

Tip: Contact LGBT Asylum Support, an organisation that supports LGBT refugees**.**
https://lgbtasylumsupport.nl/

Via your general practitioner

A general practitioner may prescribe hormones to a trans person. If you are a refugee, your general practitioner can receive reimbursement for hormone care through the CAK. For this, it is important that your general practitioner indicates that this is necessary care.

Your GP may prescribe hormones even if you have not had a psychological assessment at a gender clinic. However, few GPs currently do this. They often prefer to refer you to a specialist. You

can try to convince your GP that the waiting lists for specialists are too long and that this care can be safely provided in a GP practice. Trans in Eigen Hand, together with the NHG Expert Group on Sexology, Transgender Care Utrecht and Transvisie, has developed a manual for GPs.

Tip: Trans in Eigen Hand guide for GPs https://transineigenhand.nl/zorgverleners/GPs/

If you start taking hormones yourself, you are not obliged to inform your GP, but it is often worthwhile to do so, so that your GP can take this into account. Sometimes your GP will decide to write a prescription after all, or your doctor will want to help you by prescribing blood tests and interpreting the results.

If you cannot reach an agreement with your GP, you can also try to see another GP. The website of the organisation Trans In Eigen Hand also has a list of GPs who have already completed their training. There is no guarantee that they will prescribe hormones, but it is worth a try.

Tip: Trans in Eigen Hand list of GPs who have completed training: https://transineigenhand.nl/voor-transgender-personen/landkaart-transvriendelijke-huisartsen/

Via an online doctor

Various websites offer video consultations with GPs in Europe for a fee. These doctors can write prescriptions for you, but usually offer little guidance beyond that. In practice, this is similar to starting on your own, but with a prescription so you can get your medication from the pharmacy. You have to pay for the consultation yourself and sometimes for the medication as well. You may also be scammed: some websites take your money but ultimately do not provide a prescription.

If you are considering going to an online doctor, ask other trans people about recent positive experiences and pay close attention to how expensive it is. Do not just give out your credit card information and never allow automatic payments from your account.

Your options for starting on your own

There are several ways to obtain medication without a prescription. We list them below. First, a little bit about the legal status of starting on your own:

In the Netherlands, selling or passing on medication to people without a prescription is illegal in many cases. Buyers and users are not punishable. Buying and taking medication without a prescription is legal.

In some situations, self-medication can get you into trouble. For example, if you are a minor, under supervision or living in special housing where additional rules apply. In these cases, think carefully about whether you want to take the risk and with whom you share information.

Testosterone is considered a performance-enhancing drug in sport. Keep this in mind if you participate in sports competitions. Medication without a prescription cannot always be taken across international borders and doing so may in some cases be considered smuggling, especially if you are carrying large quantities. So make sure you are well informed before travelling with medication.

Hormones via an online seller

You can buy hormones from various webshops. These often ship from countries where this medication is available without a prescription or where regulations and controls are less strict. Webshops mainly sell feminising hormone medication. Testosterone is somewhat more difficult to find online due to stricter regulations surrounding this substance.
You usually pay by bank transfer or cryptocurrency. Then (if all goes well) you will receive a package with medication at home.

Sometimes you will receive nothing or customs will intercept the package.

If you purchase medication from these types of online shops, you may receive something that does not meet Dutch quality standards. The dose may be different than expected, it may be contaminated, or it may even contain a completely different substance than what you ordered. This does not happen very often in practice, but even one unsafe delivery can pose a significant risk.
That is why it is important to find out as much as you can about the online shop where you are ordering medication. Search the internet to see if there are any complaints about the company, ask around in the trans community to see if others have had good experiences, and check Transharmreduction.org to see if the online shop's products have been tested.

Tip: Trans Harm Reduction purchases medication from various online shops and home laboratories. This organisation has the medication tested in a laboratory and publishes the results.

https://transharmreduction.org/hrt-testing/

Hormones via an offline seller

Through other self-starters, you can get to know people from whom you can buy hormones directly. Sometimes you meet this person somewhere and exchange hormones for cash. Sometimes you call or text the person, transfer money and have the hormones sent to your home.

Substances purchased offline are sometimes bought by the seller from a webshop or a foreign pharmacy. However, substances are also sold from a home laboratory. This is called 'homebrew'.

> **Homebrew:** medication whose active ingredients are ordered from an online shop and mixed in a home laboratory to create the end product, which is then packaged. When a home laboratory purchases reliable ingredients and works in sterile conditions, this can result in good, safe medication. In practice, much of the homebrew medication sold is safe and of good quality. However, if this is not the case, even one unsafe dose can pose a major risk. That is why it is important to inform yourself properly. Ask around in the trans community whether others have had good experiences with this medication and check on Transharmreduction.org whether the products have been tested.

When buying from an offline seller, always check that the medication you receive is in its original, clean packaging and check the expiration date. Also look at the medication itself. Injection oil should be transparent, with no specks floating in it, and it should not be cloudy. Injection oil that is normally colorless should not have any color in it. You can also ask where the seller obtained the medication. If the seller does not want to tell you where the medication comes from, that is a reason to be extra cautious.

Leftover hormones from another trans person

When someone receives hormones on prescription, there is sometimes medication left over. For example, someone may switch types of medication before they used up all of the first type. There are also trans people who deliberately obtain more

medication from the pharmacy than they actually use, in order to pass on a small amount to other trans people.

If you can obtain medication in this way from a Dutch pharmacy, it is a relatively safe source. A disadvantage is that you often cannot obtain enough medication this way or you receive medication irregularly. It is not good for your health to start taking hormones when a friend has some left over and then stop when it runs out. A stable source is important for healthy and effective hormone therapy. It can also be very difficult emotionally when you finally have hormones and then have to stop again. So think carefully before accepting leftover hormones. Always check the expiration date.

Limiting risks when starting on your own

You may be alarmed by the above list of risks. We are not writing this to scare you. Many trans people have had good experiences with self-medication. If you pay attention to a few things, you can significantly limit the risks of starting hormones yourself. We have listed the most important tips for you:

1. Buy from a trusted source
Whether you buy your hormones online or offline, choose a source that is trusted by friends or the wider community. Check that the medication you receive is in the correct packaging and looks similar to what others have received from the same source.

2. Inform yourself about the effects and side effects

Make sure you know what to expect and what could go wrong, so you don't encounter any surprises. We discuss this in more detail in chapters 3 and 4. Be aware of allergies and your own health situation.

3. Take care with the dosage

Be sure to use the correct dosage. Do not use too much, as this will not speed up the changes and can be very bad for your health.

4. Get blood tests

Regularly check your hormone levels and other important blood values that indicate whether your organs are healthy. We will discuss this in more detail in Chapter 6.

5. Inject safely and do not store medication for too long

Hygiene is important to prevent infection and other complications when injecting. Pay attention to the shelf life of medication and your injection materials. Do not store reusable bottles of medication for too long. Are you unsure whether your medication or injection materials are (still) safe? Do not inject. Replace them with medication and injection materials that you feel safe using. We will tell you more about safe injection in chapter 8.

6. Do you think something is going wrong? Ask for help

For minor complaints, you can ask people in the trans community for advice. Do you think something is really wrong? Then go to your GP or call 112 in an emergency. It may be scary to tell someone that you have started taking medication yourself and you may experience negative reactions, but self-medication is not illegal and a healthcare provider must always provide health care to people who need help.

7. Look for more information, but be aware of how reliable your source is

There are many places to find help and information, both offline and online, for example on Discord and Reddit. Not all shared information is scientific. Always check whether advice is based on

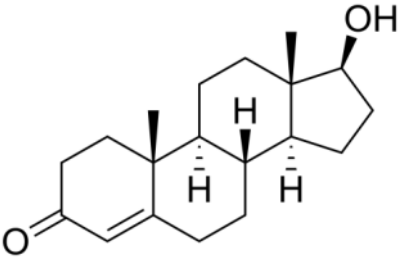
research or only on personal experience. Always check the package leaflet for medication before you start taking anything.

By doing all of the above, you can significantly reduce the risks, but you cannot reduce them to zero. This is also the case when you receive prescription medication. In that case, there are more quality standards in place to limit risks, but doctors, pharmacists and approved manufacturers do sometimes make mistakes, and prescription medication can also have side effects. Waiting years to finally get a prescription can also have adverse consequences and risks.

Starting hormone treatment yourself is a personal choice. Ultimately, no one can tell you whether it is the best choice for you. If you decide to take control of your own medication, you are not alone: there is a large community of trans people who had to make the same choice and faced the same challenges. Seek them out, talk to each other, exchange experiences. Together we are stronger, and safer, than alone.

3. Masculinising hormones

There is one active substance that masculinises the body: testosterone. In cisgender men, the testicles and adrenal glands produce a lot of this substance, while in cisgender women, the ovaries and adrenal glands produce a little. Medically, testosterone is called an 'androgen'.



The testosterone molecule

Androgen: another word for 'masculinising'.

Masculinising hormone therapy involves increasing the amount of testosterone in your body to activate 'male' puberty. This has reversible and irreversible effects, which we describe below. Testosterone use has all of these effects; you cannot pick and choose.

Testosterone: irreversible effects

Lower voice

Start: ± 3-6 months Biggest change: ± 2 years

Male puberty causes your voice to break: your voice first becomes hoarse and has high peaks, and eventually becomes deeper. This change is permanent. If you want a higher voice again, you will need to undergo voice training. After voice training, your voice will probably still sound different than it did before your transition. Do you want a low voice, but after 2 years your voice is still hoarse or you are not satisfied? Then a speech therapist can help to relax your voice and sometimes also help you lower it slightly. Your voice may continue to drop a little as you get older.

Facial and body hair

Start: ± 1-6 months Biggest change: ±5 years

Male puberty causes beard growth and more hair on the rest of your body, such as on your chest and stomach, arms and legs, but sometimes also on your back, shoulders, buttocks, hands and feet. Whether you grow a lot of hair or a little is partly determined by genetics, so looking at the men in your biological family (on your father's and mother's side) can give you an idea of what to expect, but there are no guarantees. New hair growth is permanent. If you stop taking testosterone, young hairs may fall out and mature hairs on your face and body may become lighter, but if you really want to get rid of all your new hair, you will need laser therapy.

Balding

Start: varies, minimum 6 months

Testosterone can cause baldness on the top of your head. Not everyone goes bald. The chance of going bald is greater if it runs in your family and if you are older. Baldness is permanent. If you stop taking testosterone, hair that has recently fallen out may grow back, but hair that has been gone for a long time will stay gone. There are ways to prevent baldness. We will discuss these in chapter 5.

Growth of the clitoris

Start: ± 3-6 months Biggest change: 2-3 years

Testosterone causes your clitoris to grow. This can vary from less than a centimetre to approximately 4 centimetres. The grown clitoris looks like a small penis (with foreskin) . You may feel pain during growth, or irritation when the tip of the clitoris emerges from behind the labia and rubs against them. The clitoris also grows behind the vulva and may press against the bladder outlet.

Some people feel the need to urinate frequently. These feelings are temporary. The growth of the clitoris is permanent.

Possible reduced fertility

There are theories that fertility may decrease with long-term testosterone use. Little scientific research has been done on this. Some trans men have had children after many years of testosterone use, while others have not. Because fertility also varies among cis women, it is difficult to say whether testosterone played a role in this. Consider this if you want to have children. If you want to become pregnant, it is recommended that you stop taking testosterone 3 months in advance and start taking folic acid. Do not use testosterone during pregnancy or while breastfeeding. This can be harmful to your child.

Testosterone: reversible effects

Changing fat distribution

Start: ± 1-6 months Biggest change: ± 2-5 years
Testosterone causes your body to store fat in different places. You will gain more fat on your abdomen and less on your hips and breasts. This may cause your breasts to become slightly smaller, but they will not disappear completely. You will also have less fat in places such as your face, hands, feet and knees, making your jawline, joints and blood vessels slightly more visible.

Increase in muscle mass
Start: ± 3-12 months Biggest change: ± 2-5 years

Testosterone makes it easier for your body to build muscle mass. This means you will become more muscular. If you like this, you can enhance this process by exercising. The new muscles can change your appearance and clothing sizes. For example, many people develop thicker neck muscles, which means that the neckline of shirts fits more tightly.

Cessation of menstruation

Start: ± 1-6 months

Testosterone causes your periods to stop. At first, your periods may become lighter or vary in length. In almost everyone, menstruation stops completely within 1.5 years. However, you can still get pregnant even without menstruating! Testosterone is not a contraceptive. Use contraceptives to prevent pregnancy. If you have not menstruated for a year or more and suddenly start again, it is important to contact your GP.

Vaginal 'atrophy' (dryness and irritation)

Start: ± 1-6 months Biggest change: ± 1-2 years

Testosterone use causes a shortage of estrogen in the vagina. This makes the vaginal wall thinner and less elastic. This can lead to dryness, itching, irritation and pain during penetration. You also have a higher risk of cystitis. To combat the atrophy, your GP can prescribe a vaginal estrogen pill or estrogen cream that you apply to the vagina. This cream has a local effect and does not lead to feminisation or higher estrogen levels in the rest of the body. It therefore has no effect on the rest of your transition. The ointment is also often prescribed by GPs to women going through the menopause who experience vaginal atrophy. Vaginal estrogen can have side effects; see the side effects in the chapter *Feminising hormones* and consult your GP if possible.
You can also reduce dryness and pain during penetration by using lubricant.

Increased arousal and desire for sex

Start: ± 1-3 months Biggest change: 3-6 months

Testosterone makes you feel aroused more often and increases your interest in sex. This can be annoying, especially if you become aroused at times when you don't want to or if you find the growing clitoris painful. These types of complaints usually subside after a few years, but as long as you use testosterone, you will become aroused more frequently than without testosterone. You may also experience sex differently. Some people find it easier to reach orgasm due to increased arousal. You may also develop a sexual interest in people who were not previously your type or who have a different gender identity.

Oily skin and acne (pimples)

Start: ± 1-6 months Decrease: ± 2-5 years

Testosterone makes your skin oilier. This often causes acne, mainly on the face, but sometimes also in other places. After puberty, your skin will remain oilier than before your transition, but the spots usually decrease after the first few years.

Mood swings

Start: ± 1-6 months Decrease: ± 2-5 years

Puberty can affect your emotions. You may experience stronger emotions or, conversely, weaker ones. During testosterone puberty, many people notice that negative events are more likely to cause anger than sadness and that they do not cry as easily or as often. This usually subsides after a few years. Testosterone does not change who you are as a person.

Increased appetite

Start: ± 1-6 months Decrease: ± 2-5 years

Testosterone makes most people hungrier. Puberty takes a lot of energy, so your body demands more food. Eating more can cause you to gain weight. This is useful: your body needs those extra energy reserves for your transition. It is not advisable to go on a diet during your transition: this can slow down the changes in your body, particularly the building of muscle mass. Some of your increased appetite will decrease after puberty, but some will remain, because testosterone means you will continue to use more energy even after puberty.

Other changes
You may also experience other changes, such as reduced sensitivity to cold, more or stronger-smelling sweat, increased energy or changes in your hair texture and colour.

Testosterone: side effects

As with any medication, testosterone use can cause side effects. Here are a few of the most important ones.

Higher blood pressure and increased risk of cardiovascular disease:

Cisgender men have a higher risk of cardiovascular disease than cisgender women. Testosterone use raises your blood pressure and makes your risk of cardiovascular disease comparable to that of a cisgender man. The risk increases with higher doses of testosterone. High doses are also bad for your liver.

Allergic reaction to the oil in which the medication is contained:

Testosterone injections may contain peanut oil (arachidic oil) or soybean oil. Pay close attention to this and do not inject alone if you might be allergic. Ask someone to keep an eye on you. Do not inject yourself with oils that you are allergic to. If you have anti-allergy medication, keep it handy. Testosterone gel can cause redness, itching and irritation on the area of skin where it is applied. If the skin itches a lot and remains irritated for a long time, this may be an allergic reaction of the skin.

Tip: A complete overview of possible side effects of testosterone can be found on the Pharmacotherapeutic Compass

https://www.farmacotherapeutischkompas.nl/bladeren/preparaatteksten/t/testosterone

Do you have diabetes? If so, be aware that your insulin sensitivity may increase. The dosage of your medication may need to be adjusted.

Osteoporosis: If you are taking a low dose of testosterone and also produce little estrogen, for example because you do not have a uterus or have gone through the menopause, your bone density may decrease. In that case, it is advisable to take vitamin D supplements and get enough calcium through your diet or supplements.

Seek medical help if you have a history of:

- Coagulation problems (blood clotting)
- Polycythaemia (too many red blood cells)
- Risk of thrombosis
- Elevated haematocrit value (too many red blood cells)
- Prostate cancer

A doctor can work with you to determine how to make your testosterone use as safe as possible.

Testosterone use is not recommended in the following cases:

- Hormone-dependent cancer
- Cancer-related hypercalcaemia (too much calcium in the blood)
- Personal history of liver cancer
- Liver failure, kidney failure and heart failure

If you have one of these conditions, it does not mean that you cannot transition in any way, but it does mean that this must be considered very carefully, with close attention to the risks. For some, hormones are so important that they should be considered life-saving care, while for others, hormones are not an essential part of their transition, or it is possible to treat the disease first and only then carefully consider the possibilities of hormone use.

Testosterone: types of medication and administration

Androgel

Packaging: available in a dispenser bottle or in sachets.

Administration: apply the gel daily to your shoulders, upper arms and chest. Allow it to dry for approximately 5 minutes before putting on clothing and allow it to dry for 2 hours before showering and 4 hours before skin-to-skin contact with another person. Testosterone gel can be transferred to others through contact with bare skin. This means that your partner and other people or pets you cuddle may absorb testosterone into their bodies. Wash your hands thoroughly after application.

A common side effect of the gel is skin irritation and itching. Alternate between application sites to reduce skin irritation.

Dosage: Low: 20 mg per day (1 pump or 0.5 sachet)

Medium: 40 mg per day (2 pumps or 1 sachet)

High: 80 mg per day (4 pumps or 2 sachets)

The gel contains 16.2 mg of testosterone per ml. Each press of the dosing pump dispenses 1.25 ml, which contains 20.25 mg of testosterone. The sachets contain 40.2 or 50 mg per sachet; check the packaging.

Sustanon

Packaging: injection fluid in a 1 ml glass vial

Administration: intramuscular injection

Dosage: one vial of Sustanon contains 1 ml of liquid (usually peanut oil) containing 250 mg of testosterone.
Because the vial cannot be reused, you inject everything at once. You can vary the dosage by injecting more or less frequently:

Average: once every 3 weeks (1 vial)
High: once every 2 weeks (1 vial)

Sustanon contains different types of testosterone, some of which work quickly and others slowly. This ensures a stable amount of testosterone in the body. The different substances are: 30 mg testosterone propionate, 60 mg testosterone phenylpropionate, 60 mg testosterone isocaproate and 100 mg testosterone decanoate. In addition to peanut oil, the injection contains benzyl alcohol as a preservative.

Nebido (testosterone undecanoate)

Packaging: injection fluid in a 4 ml glass vial

Administration: injection into the muscle.
Because Nebido contains a large amount of oily injection fluid, it is preferable to have it injected into the gluteal (butt) muscle by a nurse, doctor or someone else with the appropriate training. It is possible to do this injection yourself, in the thigh muscle. Do this while sitting and do it very slowly, approximately 4 ml in 2 minutes, i.e. 1 ml in

30 seconds. In chapter 8, we explain in detail how to administer an injection into the muscle.

Dose: a bottle of Nebido contains 4 ml of liquid containing 1000 mg of testosterone undecanoate (250 mg per ml). Because the bottle cannot be reused, you inject everything at once.

Low:	Once every 14 weeks (1 vial)
Average:	Once every 12 weeks (1 vial)
High:	Once every 10 weeks (1 vial)

Are you just starting with testosterone? Then administer your second injection after 6 weeks, and continue every 12 weeks thereafter. If you are switching from another form of testosterone to Nebido, this is not necessary.

The injection usually also contains castor oil and benzyl benzoate as a preservative.

Testosterone cypionate

Packaging: injection fluid in a 5 to 10 ml glass vial with a special barrier for reuse. Testosterone cypionate is not available on prescription in the Netherlands.

Administration: injection into the fat at a dose of less than 0.5 ml. Injection into the muscle at a dose above 0.5 ml or if you experience significant skin irritation from an injection into the fat. In chapter 8, we explain in detail how to administer an injection into the fat or the muscle.

Dosage: the testosterone cypionate injection liquid may contain 200 mg of testosterone per ml or 250 mg per ml, so pay close attention to the packaging.

At a concentration of 200 mg per ml, inject:

Low: 0.25 ml (50 mg) per week
or 0.5 ml (100 mg) every 2 weeks

High: 0.5 ml (100 mg) per week
or 1 ml (200 mg) every 2 weeks

At a concentration of 250 mg per ml, inject:

Low: 0.2 ml (50 mg) per week
or 0.4 ml (100 mg) every 2 weeks

High: 0.4 ml (100 mg) per week
or 0.8 ml (200 mg) every 2 weeks

Testosterone cypionate is the most common injection fluid you will encounter as self-medication. It may come from a foreign pharmacy or a home laboratory. The injection fluid may contain peanuts, soy or something else, so pay close attention to possible allergies. The added preservatives may also vary.

Testosterone enanthate
Packaging: injection fluid in a 1 ml glass vial for single use or in a 5 ml vial with a special barrier for reuse. Testosterone enanthate is not available on prescription in the Netherlands.

Administration: injection into the fat at a dose of less than 0.5 ml. Injection into the muscle at a dose above 0.5 ml or if you experience significant skin irritation from an injection into the fat.

Dosage: the testosterone enanthate injection solution may contain 200 mg of testosterone per ml or 250 mg per ml, so pay close attention to the packaging. The dosage is the same as for testosterone cypionate.
Testosterone enanthate can come from a foreign pharmacy or a home laboratory. The injection fluid may contain peanuts, soy or

something else, so pay close attention to possible allergies. The added preservatives may also vary.

Testosterone: determining the dose

When choosing your testosterone dose, it is tempting to think that your body will change faster if you take more testosterone, but that is not how it works. Puberty progresses at a steady pace and cannot be accelerated. You only 'turn on' puberty by having enough testosterone in your blood.

Effective dose: the minimum dose needed to start puberty and notice the changes.

An effective amount of testosterone in your blood is between 10 and 30 nmol/l. In the *Blood Tests* chapter, we explain what these units mean. At this amount, puberty will start, with all the effects mentioned above. Higher is not better in this case. Someone with a blood level of 12 nmol/l can look and feel just as masculine as someone with a blood level of 28 nmol/l.
The 'low', 'normal' and 'high' doses are tailored to achieve 10 and 30 nmol/l. The low dose gives an average blood level of around 10 nmol/l. A high dose gives an average blood level of around 30 nmol/l. The actual blood level you get per dose varies from person to person.

Tip: The Steroid Plotter is an online tool that allows you to see what your average blood values will be at a certain dose. This tool was not created for trans people, but if you select 'hormones' under 'compound' and then 'testosterone', you can calculate testosterone

use. This tool does not measure in nmol/l but in ng/dl.
A blood value of 10 nmol/l is 288 ng/dl and a blood value of 30 nmol/l is 865 ng/dl.

https://steroidplotter.com/

The only way to really know what your blood values are is to have blood tests done. In the first year of using hormones, it is a good idea to check once every 3 months whether your testosterone is between 10 and 30 nmol/l and to adjust your dose if it is not. With or without blood tests, it is always a good idea to watch out for symptoms that indicate too much or too little testosterone in your blood.

Symptoms of too low a dose: fatigue, feelings of depression and menopausal symptoms such as hot flushes, night sweats and mood swings.

Symptoms of too high a dose: fluid accumulation in the legs or abdomen (called water retention or oedema), hot flushes, feeling weak and listless, tingling hands or feet, muscle or joint pain, nervousness or irritability, and high blood pressure.

You can also have the wrong dose without noticing any symptoms. Blood tests therefore remain important.

Taking too much testosterone has another disadvantage: if the dosage is too high, your body will convert the excess testosterone back into estrogen, which will slow down your transition. An excessive dosage is therefore less effective . Some clinics therefore currently maintain a low dosage as standard and aim for blood levels of 10 to 24 nmol/l to avoid excessive testosterone.

Testosterone: microdosing

Some people choose to take a very low dose of testosterone in the hope that fewer changes will occur or that the changes will be slower. This is called 'microdosing'. Microdosing is difficult and quite unpredictable.

Cisgender women have an average of between 0.5 and 2.8 nmol/l of testosterone in their blood. Even a slight increase in testosterone to 4 nmol/l can cause changes such as increased muscle mass, a deeper voice, clitoral growth, some increase in facial and body hair, and mood swings. Full beard growth and changing fat distribution usually only occur above 10 nmol/l, but this varies from person to person. Bodies remain diverse and unpredictable.

There has not been enough research into microdosing to say with certainty what changes you can and cannot expect at a certain dose. If you want to go down this route, it is wise to build up your dose very slowly until you see the changes you want and then keep an eye out for any unwanted changes that may occur later. Keep in mind that you may still experience changes that you do not actually want.

Also pay attention if you experience menopausal symptoms such as hot flushes, night sweats, mood swings, fatigue or feelings of depression. This may mean that you have too few hormones (or testosterone) in your blood. This can lead to bone density loss (osteoporosis), which is very harmful in the long term. When microdosing testosterone, it is always advisable to take vitamin D and get enough calcium through food or supplements.

Other substances

Young trans people are often given puberty blockers that pause the development of the body. If you use testosterone, adding a puberty blocker has no benefits. If you do not use testosterone, taking a puberty blocker as an adult is dangerous. This causes accelerated menopause and osteoporosis, which is very harmful in the long term. Too few hormones also cause immediate symptoms such as fatigue and feelings of depression.

Many supplements and herbs are available on the internet and in bodybuilding shops that claim to increase your testosterone levels or make you more masculine. Most of these remedies do nothing at all, and some are very bad for your health. In general, these types of remedies are of no use to you. Only testosterone has masculinising effects. Even if you want to build more muscle, it is better to avoid supplements and simply opt for regular exercise and a healthy diet with sufficient protein, carbohydrates and healthy fats.

Influencing clitoris growth

Some people would like to see less or more growth of the clitoris. All kinds of tricks and remedies are recommended within trans communities to achieve this. There is no evidence for most of these. For example, rubbing a little testosterone on your clitoris will not result in extra growth, because the substance cannot be absorbed in this way. Stretching the clitoris or using a vacuum pump also has no permanent effect. The only thing for which there is limited evidence is the influence of *dihydrotestosterone* (DHT). This is a substance that affects hair growth, but also the growth of the clitoris:

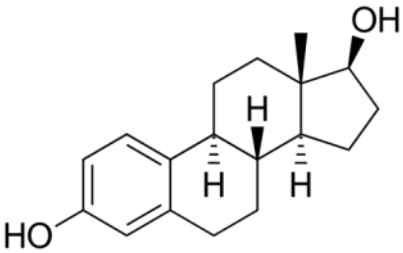
- It appears that the DHT-blocking agent Finasteride reduces clitoral growth. More information about this agent can be found in chapter 5.
- It appears that DHT cream may promote clitoral growth to a small extent, but research on this has been conducted on men with an intersex condition, not on trans men. DHT cream is generally difficult to find.

Because the amount of clitoral growth varies greatly from person to person, it is difficult to know how effective these drugs are.

4. Feminising hormones

To feminise the body, the active substance estrogen must be present in your body and testosterone must be low.

In cisgender women, the ovaries produce estrogen. In cisgender men, the testicles produce a small amount of estrogen. Feminising hormone therapy involves increasing the amount of estrogen in your body and decreasing the amount of testosterone in your body to activate 'female' puberty. Estradiol, the most common type of estrogen in the body, is used for this purpose.



The estradiol molecule

Estradiol: a form of estrogen used for hormone therapy.

When you put estrogen in your body, your body produces less testosterone and you often achieve this lower testosterone naturally. If this is insufficient, a medication that lowers testosterone can be taken.

Female puberty has irreversible and reversible effects, which we describe below. Estrogen use causes all of these effects; you cannot choose.

Estradiol: irreversible effects

Breast growth

Start: ± 3-6 months Biggest change: first 3 years

Female puberty causes breast growth. Your body produces mammary glands surrounded by fatty tissue. This can cause growing pains and sensitive nipples. How large your breasts will become depends mainly on genetic predisposition, so you can look at the women in your biological family to estimate what you can expect. On average, trans women develop slightly smaller breasts than the cisgender women in their family. Breasts grow most during the first three years, but growth may continue after that. How long this continues varies from person to person. Breast growth is not reversible. If you stop taking estrogen, your breasts may shrink slightly, but you will need surgery to achieve completely flat breasts. Breast growth increases your risk of breast cancer. It is therefore important to check your breasts for hard spots and lumps a few times a year and to see your doctor if you have any concerns. If you are 50 or older, it is advisable to have a breast cancer screening every two years. At the beginning of breast growth, you will first develop two hard discs under the nipple. This is normal and not a sign of breast cancer.

Tip: thuisarts.nl has detailed information on how to check your breasts for signs of breast cancer.
https://www.thuisarts.nl/borstkanker-opsporen/ik-wil-zelf-mijn-borsten-onderzoeken

Decrease in penis and testicle size

Start: ± 3-6 months Biggest change: ± 3 years
When your body has low testosterone levels, the penis and testicles become smaller. How much they shrink varies from person to person. If you stop taking estrogen, you may regain some of the size, but it is not certain how much. The size of the penis decreases less if you have an erection at least once a week. If your penis shrinks, there will be less tissue available for vaginoplasty. It is therefore wise to give yourself an erection from time to time if you want to have vaginoplasty in the future.

Reduced sperm production and fertility

Start: unknown Biggest change: unknown
Estrogen use causes your testicles to produce less sperm and reduces your fertility. If you stop taking estrogen, your sperm production may increase again, but it is not certain by how much. Little scientific research has been done on this. There is a chance that you will be less fertile after using estrogen. Think about this if you want to have children. It is possible to freeze sperm. Estrogen is not a contraceptive. Even if you have very little ejaculate, you can still be fertile and get someone pregnant. Use other contraceptives to prevent pregnancy.

Estradiol: reversible effects

Changing fat distribution

Start: ± 3-6 months Biggest change: ± 2-5 years
During female puberty, your body will start storing fat in different places. You will have less fat on your tummy and more on your hips and breasts. You will also have a little more fat on your face, hands, feet and knees. This will give you a slightly rounder face

shape. This change takes energy and works best if you eat enough and exercise. Dieting or deliberately fluctuating your weight ('weight cycling') is not advisable. Evolutionarily, your body has learned to retain fat when food is scarce, so dieting will slow down the redistribution of fat. Dieting can also have a negative effect on breast growth. Do not worry if you gain some weight during your transition. This is normal and contributes to a more feminine appearance.

Decreasing muscle mass

Start: ± 6-12 months Biggest change: ± 2-5 years

When your body has less testosterone, it becomes more difficult to build muscle tissue. You will therefore become less muscular. If you do not want this to happen, it helps to eat enough and exercise. Choose a sport that uses the muscles you want to retain and eat a healthy diet with sufficient protein, carbohydrates and healthy fats.

Decreased arousal and erections

Start: ± 1-3 months Biggest change: 3-6 months

When your body has less testosterone, you experience less desire for sex. You no longer get spontaneous erections and sometimes have difficulty getting or maintaining an erection. If you find this unpleasant, it is advisable to ensure that you get an erection at least once a week. Locally applied testosterone cream can help (not alcohol-based gel). You can also use medication that stimulates blood flow to the penis. The best-known drug is Sildenafil, known under the brand name Viagra. When you stop taking estrogen, your arousal and erections will usually return to normal, but there is a small chance that you will continue to have erection problems.
Low testosterone does not mean that you will no longer feel like having sex. After all, most cisgender women also enjoy sex. You

may need to rediscover what turns you on and what makes you climax. This can take time.

Softer skin

Start: 3-6 months Biggest change: unknown

Estrogen makes your skin less oily and softer to the touch. Pores become less visible and your skin tone may become warmer (rosier for white skin, reddish-brown for brown skin). This can sometimes make you look younger.

Mood swings

Start: ± 1-6 months Decrease: ± -5 years

Puberty can affect your emotions. You may experience stronger emotions or, conversely, weaker ones. During estrogen puberty, many people notice that they feel emotions more intensely and cry more easily. This usually subsides after a few years. Estrogen does not change who you are as a person.

Thinner body hair

Start: ± 6-12 months Biggest change: ± 2-5 years

When your body has less testosterone, the hair on your face and body becomes thinner and lighter in colour. The hair does not disappear. If you want to remove hair from your face or body, you will need laser hair removal, electric hair removal or another treatment.

Cessation of baldness and possible hair regrowth

Start: ± 1-3 months Biggest change: unknown

When your body has less testosterone, the process of balding stops. It is also possible that some hair will grow back, especially if the balding started recently. Not everyone experiences hair regrowth, and the amount that grows back is often limited.

Less energy

Start: ± 1 month Biggest change: unknown

Many people experience a large or small decrease in their energy levels. People who use a testosterone blocker often suffer from this more than people who only use estradiol.

Other changes:
You may also experience other changes, such as increased sensitivity to cold, sore nipples, headaches and sweat that smells different.

Estradiol: side effects

As with any medicine, you may experience side effects when using estradiol. Here are a few of the most important ones.

Fluid retention (oedema): particularly at high doses – but sometimes also at normal doses – fluid retention can occur in places where your body does not normally retain fluid, such as the feet, ankles and lower legs. Oedema can sometimes also occur in the lungs. This is rare, but it is dangerous. You can recognise pulmonary oedema by symptoms such as shortness of breath and tightness in the chest when lying down. Consult a doctor as soon as possible if you think you have pulmonary oedema. Are you having difficulty breathing or are your lips or nails turning blue? Call 112.

Higher blood pressure

Estradiol use can cause a slight increase in blood pressure.

Poorer liver function

Estradiol tablets put more strain on the liver than estradiol administered through the skin (gel or patch) or by injection. In

people with a healthy liver, this rarely leads to liver problems, but it does lead to a higher risk of thrombosis.

Thrombosis

Estradiol (especially the tablets) increases the risk of a blood clot in the vein (thrombosis), often in the leg. If such a clot breaks loose, it can end up in the pulmonary artery, among other places. This is called a pulmonary embolism. This is rare, but it is dangerous. It mainly occurs when the dose is too high. You can usually recognise this by shortness of breath, dizziness, coughing, rapid heartbeat and/or chest pain. Consult a doctor as soon as possible if you think you have a pulmonary embolism.

Depression

Some people experience symptoms of depression when using estradiol.

Allergic reaction to the oil in the medication

Estradiol injections may contain peanut oil (arachidic oil) or soybean oil. Pay close attention to this if you are (potentially) allergic. If there is a chance of an allergic reaction, make sure someone is with you when you inject. If you have anti-allergy medication, keep it handy. Estradiol gel or patches can cause redness, itching and irritation on the skin where the patch is applied. If the skin itches a lot and remains irritated for a long time, this may be an allergic reaction of the skin.

Tip: A complete overview of possible side effects of estradiol can be found on the Pharmacotherapeutic Compass: https://www.farmacotherapeutischkompas.nl/bladeren/preparaatteksten/e/estradiol_oraal

Seek medical help if you have a history of:

- Diabetes
- High blood pressure
- Cardiovascular disease, stroke, thrombosis
- Gallbladder disease

A doctor can work with you to determine how to make your estrogen use as safe as possible.

Estradiol use is not recommended in the following cases:

- Hormone-dependent cancer
- Cancer-related hypercalcaemia (excess calcium in the blood)
- Personal history of liver cancer
- Liver failure, kidney failure or heart failure

If you have one of these conditions, it does not mean that you cannot transition in any way, but that it must be considered very carefully, with close attention to the risks. For some, hormones are so important that they should be considered life-saving care, while for others, hormones are not an essential part of their transition, or it is possible to treat the threatening disease first and only then carefully consider the possibilities of hormone use.

Estradiol: types of medication and administration

Estradiol tablets

Packaging: a box containing a strip of pills. Sold under the names Estradiol, Estrofem, Progynova and Zumenon. Usually in 2 mg tablets.

Administration:
You can swallow the tablets (oral intake).
The medicine then enters the bloodstream via the liver. You can reduce the strain on the liver by allowing the tablet to dissolve under the tongue (sublingual) or in the cheek (buccal), so that more of the medicine is absorbed into the bloodstream. If you do this, you will then need a lower dose, sometimes even half the normal oral dose. This is most effective shortly after drinking a warm beverage. Some pills need to be broken before they can dissolve.

Dose when swallowed:

average: 4 mg per day
(1 tablet of 2 mg in the morning and 1 in the evening)

High: 6 mg per day, (1 tablet of 2 mg every 8 hours)

The absorption of Estradiol tablets varies from person to person, which means that the correct dose also varies greatly from person to person. Only a blood test can determine whether you are taking the correct dose.

Estradiol patch

Packaging: a box of patches. Patches are also sold under the names Systen or Sandos. The strength is usually indicated in micrograms (µg) per 24 hours. Most patches are 50 mg/24 hours or 100 mg/24 hours.

Administration: clean the skin and stick the patch on your upper arm, thigh, stomach or bum. Do not stick it over any wounds.
A common side effect of patches is skin irritation and itching. Alternate between at least two application sites (e.g. left and right leg) to reduce skin irritation. Some patches do not stick well or come off when you sweat. People who exercise a lot are particularly affected by this. You can secure the patch with skin-friendly tape or bandages or try a different brand.

Dosage: the patch must be changed every 3 to 4 days. For an average dose, apply one 100 microgram/day patch every 3 to 4 days. You can adjust the dose by cutting the patches in half. The unused half cannot be stored, as the active ingredient will deteriorate. You can share this half with someone else or put it back in the packaging and then deposit it in the medicine return box at your pharmacy.

Estrogel or Estradiol spray

Packaging: available in a pump bottle or as a spray.

Administration: clean the skin and spray or rub the gel onto your upper arm, thigh, buttock or underbelly starting 2 cm below the navel. Do not apply to the breasts. A common side

effect of the gel is skin irritation and itching. Alternate between application sites to reduce skin irritation.

Allow the gel or spray to dry for approximately 5 minutes before putting on clothing and allow it to dry for 2 hours before showering or skin-to-skin contact with another person. Estrogel can be transferred to others through contact with bare skin. This means that your partner and other people or pets that you cuddle may absorb unwanted estrogen into their bodies. Wash your hands thoroughly after application.

Gel dose:	low: 0.75 mg per day	(1 pump)
	average: 1.5 mg per day	(2 pumps)
	high: 3 mg per day	(4 pumps)

Estrogel has a strength of 0.6 mg estradiol per gram of gel. One pump delivers 1.25 grams of gel (= 0.75 mg estradiol).

Spray dose:	average: 3.06 mg per day	(2 sprays)

The spray is poorly absorbed by the skin, which means that not everyone achieves the desired effect with it. In this case, switching to another product is better than spraying a lot.

Estradiol valerate

Packaging: injection fluid in a glass vial, usually 5 ml, with a special barrier for reuse. The most common strength is 40 mg estradiol per millilitre of injection fluid. This medicine is not available on prescription in the Netherlands.

Administration: injection into the fat; if you experience significant skin irritation, you can also opt for intramuscular injection.

Dosage: at a concentration of 40 mg per ml:

Low: 0,025 ml (1 mg) every 5 days

Medium: 0.5 ml (2 mg) every 5 days

High: 0.15 ml (6 mg) per week

The type of oil and preservative in Estradiol valerate may vary. Pay close attention to this if you have allergies.

Estradiol enanthate

Packaging: injection fluid in a glass vial with a capacity of 5 or 10 ml, with a special barrier for reuse. The most common strength is 40 mg per ml or 50 mg/ml. This medicine is not available on prescription in the Netherlands.

Administration: injection into the fat; if you experience significant skin irritation, you can also opt for intramuscular injection.

Dosage:

At a concentration of 40 mg per ml:

Low: 0.038 ml (1.5 mg) per week
or 0.075 ml (3 mg) every 2 weeks

Medium: 0.075 ml (3 mg) per week
or 0.15 ml (6 mg) every 2 weeks

High: 0.15 ml (6 mg) per week
or 0.3 ml (12 mg) every 2 weeks

At a concentration of 50 mg per ml:

Low: 0.03 ml (1.5 mg) per week
or 0.06 ml (3 mg) every 2 weeks

Medium: 0.06 ml (3 mg) per week
or 0.12 ml (6 mg) every 2 weeks

High: 0.12 ml (6 mg) per week
or 0.24 ml (12 mg) every 2 weeks

The type of oil and the type of preservative in estradiol enanthate may vary. Pay close attention to this if you have allergies.

Estradiol cypionate

Packaging: injection fluid in a glass vial containing 5 or 10 ml, with a special closure for reuse. The most common strength is 40 mg/ml. This medicine is not available on prescription in the Netherlands.

Administration: injection into the fat; if you experience significant skin irritation, you can also opt for intramuscular injection.

Dosage: at a concentration of 40 mg per ml:

Low: 0.038 ml (1.5 mg) per week
or 0.075 ml (3 mg) every 2 weeks

Medium: 0.075 ml (3 mg) per week
or 0.15 ml (6 mg) every 2 weeks

High: 0.15 ml (6 mg) per week
or 0.3 ml (12 mg) every 2 weeks

The type of oil and preservative in estradiol cypionate may vary. Pay close attention to this if you have allergies.

Estradiol undecylate

To date, little research has been done on this long-acting form of estrogen, its possible side effects and risks. The dose required varies greatly from person to person and it is difficult to stabilise blood levels. Estradiol undecylate therefore requires more blood tests and is not an easy drug to start with. This medicine is not available on prescription in the Netherlands.

Packaging: injection fluid in a glass vial.

Administration: intramuscular injection.

Dosage: at a concentration of 50 mg per ml:

Low: 0.12 ml (6 mg) per 28 days

Average: 0.24 ml (12 mg) per 28 days

High: 0.48 (24 mg) per 28 days

The type of oil and the type of preservative in estradiol undecylate may vary. Pay close attention to this if you have allergies.

Estrogen: determining the dose

When choosing your estrogen dose, it is tempting to think that more estrogen will bring about faster changes, but this is not how it works. Puberty progresses at a fixed rate and cannot be accelerated. You will not get more or better results from a higher dose.

Effective dose: the minimum dose needed to start puberty and notice the changes.

Two things are needed to activate ‘female’ puberty:

- Estrogen levels in the blood of more than 367 pmol/l. Generally between 367 and 734 pmol/l.
- Testosterone levels below 3 nmol/l.

In the *Blood Tests* section, we explain what these units mean. At these levels, female puberty will start, with all the effects mentioned above. Higher estrogen is not better in this case. Someone with a blood level of 400 pmol/l can look and feel just as feminine as someone with a blood level of 700 pmol/l.
Some people strive for lower testosterone levels, below 1.7 nmol/l. At such low testosterone levels, arousal and erections will decrease significantly. It is advisable to stay above 1 nmol/l. Estradiol use lowers testosterone levels and, for many people, the desired testosterone level is achieved automatically through estradiol use alone. If testosterone remains too high, you can take a little more estrogen, but try to keep the estrogen levels in the blood below 918 pmol/l. Another option is to use a testosterone blocker. We will tell you more about this below.

The “low” dose is sufficient for most people who use a testosterone inhibitor. Those who do not take an inhibitor often need the “normal” dose to sufficiently suppress their testosterone. If a normal dose is unsuccessful at suppressing testosterone, you can try the “high” dose or opt for an inhibitor. Weigh up the risks and use regular blood tests. Do not start with a high dose, as this may be far too much for you.

Tip: Transfem Science's Injectable Estradiol Simulator is an online tool that allows you to see what blood levels you can expect on average with a certain dose. Make sure to check whether the blood levels are in pg/ml or pmol/l.

https://transfemscience.org/misc/injectable-e2-simulator-advanced/

The actual blood level you get per dose varies from person to person. The only way to really know what your blood levels are is to have blood tests done. With or without blood tests, it is always a good idea to watch out for symptoms that indicate too much or too little estradiol or testosterone in your blood.

Symptoms of low estradiol: if you take too low a dose of estradiol without having low testosterone, you will notice little difference. If your testosterone is also low, you may notice that you generally have too few hormones. This is noticeable in fatigue, feelings of depression and menopausal symptoms such as hot flushes, night sweats and mood swings.

Symptoms of high estradiol: too high a dose of estradiol has few easily recognisable symptoms. You often do not notice it in how you feel, but you are at greater risk of serious side effects. Blood tests are therefore important. One symptom you may notice is milk production from the nipple (lactation). Lactation also occurs with excessive doses of cyproterone acetate and with some antipsychotics.

Symptoms of low testosterone: fatigue, very low sex drive, erectile dysfunction, sadness or depression.

Symptoms of high testosterone: increased energy and sex drive, no feminization. Some feminization changes may reverse over time if testosterone remains high.

Microdosing

If you want to microdose estrogen (take a very small amount), try to keep the estrogen levels in your blood above 183 pmol/l. At a lower dose, you run the risk of osteoporosis (low bone density), which is very harmful in the long term. In practice, estrogen microdosing is not a suitable way for most people to pursue a slower or incomplete transition. It can have two outcomes:

- testosterone is not sufficiently suppressed, the estrogen physically changes nothing or very little. There may be emotional or mental changes.
- testosterone is sufficiently suppressed, the estrogen initiates full ‘female’ puberty.

Microdosing mainly produces uncertain results and no 'middle ground' transition. Still, some people may feel physically, emotionally or mentally better when microdosing. At the end of this chapter, we will discuss other options for slowing down your transition or reducing the likelihood of certain outcomes.

Testosterone inhibitors

If your testosterone does not drop below 3 nmol/l through estrogen use alone, you can choose to use a testosterone inhibitor or 'blocker'. This is also called an anti-androgen.

> **Anti-androgen:** a substance that blocks the production or impact of testosterone.

There are various inhibitors, some of which have their own side effects and risks. Possible side effects of all inhibitors include:

- Fatigue and reduced energy
- Mood swings, particularly depression
- Lower libido, fewer erections
- Osteoporosis, especially if estrogen levels are also low
- Hot flushes, especially if estrogen levels are also low
- Weight gain

Testosterone inhibitors put extra strain on the liver. It is therefore advisable to have additional blood tests. Seek medical help if you have a history of:

- Coagulation disorder (blood clotting)
- Use of blood thinners
- QTc prolongation
- Liver failure, kidney failure or heart failure

Testosterone inhibitors must be used in combination with estrogen. If you only block your testosterone without replacing it with estrogen, your body will have too few hormones. In the short term, this causes menopausal symptoms such as hot flushes, night sweats, mood swings, fatigue, feelings of depression, erectile dysfunction and skin ageing. In the long term, it can lead to bone density loss (osteoporosis), which is very harmful.

Testosterone inhibitors: types and administration

Estradiol esters all work in much the same way; the only difference is how long they remain in your body, but it is essentially the same substance. Testosterone inhibitors are very different and can each have their own side effects and risks, in addition to the side effects and risks mentioned above that apply to all testosterone inhibitors. If you don't like the side effects of a particular blocker, you can try another one.

Cyproterone acetate

This drug is also known as 'cypro' or CPA and is sold under the brand name Androcur.

Possible side effects and risks: particularly at high doses: feelings of depression, excessive prolactin levels in the blood, milk production in the breasts, inhibition of breast growth. A slightly increased risk of cardiovascular disease and breast cancer, particularly at high doses.

Packaging: 10 or 50 mg tablets. Use a pill cutter to break your tablets into accurate doses.

Dosage: low: 5 to 6 mg per day

average: 10 to 12.5 mg per day

In the past, cyproterone acetate was prescribed in very high doses to trans women. This was unsafe and did not produce good results. As a result, the drug has a bad reputation in the trans community. At the doses mentioned above, its use is just as safe as other testosterone inhibitors.
High doses of cyproterone acetate cause a significantly increased

risk of meningioma, a tumour that develops in the brain. It is not certain whether this risk also occurs at lower doses. As a precaution, it is advisable not to take cyproterone acetate for longer than 2 years and not to exceed 12.5 mg per day.

Spironolactone

This drug is also sold under the brand name Aldactone. It works differently from most inhibitors. It hardly inhibits the production of testosterone, but mainly blocks the testosterone receptors. As a result, you may see little difference in the testosterone levels in your blood test, but still experience the desired effects in your transition. Spironolactone is less effective than most other inhibitors and is not suitable if your testosterone levels are very high.

Possible side effects and risks: lower blood pressure, more frequent urination, headaches, diarrhoea, higher potassium concentration in the blood. Spironolactone should not be combined with other medications that can increase the concentration of potassium in the blood, such as the antibiotic trimethoprim and the anti-inflammatory drug cyclosporine. This poses a high risk of hyperkalaemia, a dangerous and sometimes even fatal complication. In people with an increased risk of hyperkalaemia or heart problems, it is important to monitor potassium levels closely when using spironolactone. This is also recommended for people over 50 years old.

Packaging: tablets of 12.5 mg, 25 mg, 50 mg, or 100 mg

Dosage: low: 50 mg per day
average: 150 mg per day
high: 250 mg per day

Bicalutamide

This drug is also sold under the brand name Casodex.
Bicalutamide has been used for a long time in the treatment of prostate cancer, but only recently in transgender people. Because little research has been done on its use and the correct dosage in this context, some treatment guidelines advise against prescribing Bicalutamide. It does not inhibit testosterone production, but blocks the testosterone receptors.
Possible side effects and risks: nausea, constipation or hard stools, abdominal pain, increased cholesterol, risk of liver damage. With bicalutamide, there is a very small chance of liver failure, which manifests itself in the first few months, so it is advisable to test liver function during the first few months. Do not use bicalutamide if you have heart or liver problems.

Packaging: 50 mg tablets

Dosage: 25 mg per day. Cut the tablet in half with a pill cutter.

Buserelin

This is a so-called 'Gonadorelin (GnRH) agonist'. It stimulates the pituitary gland, causing it to produce extra testosterone for a short period (about 1 week) and then become exhausted and produce much less. If you continue to take the drug after that, your testosterone levels will remain low. Little research has been done on the use of buserelin by trans people.

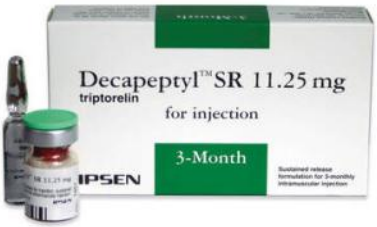
Possible side effects and risks: as a nasal spray, buserelin may cause nasal irritation, nosebleeds, hoarseness and changes in taste and smell. Due to the short spike in testosterone, buserelin

may exacerbate hormone-sensitive cancers. It does not cause cancer, but existing cancer will grow faster.

Packaging: nasal spray

Dose: 0.2 mg every 8 hours. The concentration of the liquid may vary. Check the packaging to determine how much you need.

Triptorelin



This medicine is sold under the brand names Decapeptyl, Pamorelin and Salvacyl. It is a so-called 'Gonadorelin (GnRH) agonist'. It stimulates the pituitary gland, causing it to produce extra testosterone for a short period (about 1 week) and then become exhausted and produce much less. If you continue to take the medicine after that, your testosterone levels will remain low.

Possible side effects and risks: side effects often occur with triptorelin use. Common side effects include depression, sleep disorders, mood disorders, reduced libido, erectile dysfunction, pain when urinating, headaches, dry eczema (seborrhoea) and bone pain. Triptorelin does not interact well with many types of medication. If you are also taking other medication, always check for interactions.

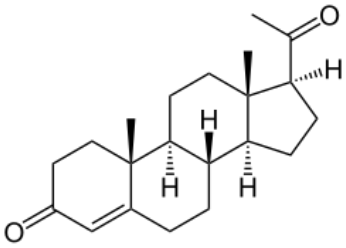
Packaging: injection fluid in a glass vial or in a ready-to-use syringe.

Administration: injection into the fat at a dose of less than 0.5 ml. Injection into the muscle at a dose above 0.5 ml or if you experience significant skin irritation from an injection into the fat.

Dose: 3.75 mg every 4 weeks
11.25 mg per 12 weeks

Progesterone

In addition to testosterone and estrogen, humans produce progesterone. Cisgender women produce much more of this hormone than cisgender men. The main function of progesterone is to regulate the uterus and pregnancy



The progesterone molecule

In 2025, Amsterdam VUmc investigated the use of progesterone by trans women who also used estradiol. The study showed that progesterone often led to increased breast growth and greater body satisfaction. Even trans women who had been using estradiol for many years experienced new breast growth when starting progesterone. It is important to note that this is only one study. We probably do not yet know everything about progesterone use, and your experience may be slightly different.

Within self-medication communities, people who use progesterone report that it gives them a slightly higher libido, more energy and fewer mood swings, but there are also users who report the opposite, and there is no evidence for these effects.

Side effects and risks

No health risks were observed in the Amsterdam VUmc study. Participants did experience side effects such as fatigue, breast or nipple tenderness, and mood swings.
Previous use by cisgender women saw side effects such as headaches, vomiting, diarrhoea, constipation and pain in the muscles, bones or joints. Many people experience drowsiness and dizziness 1 to 4 hours after taking it. For this reason, progesterone

is often taken before bedtime.
There is limited evidence that progesterone may increase the risk of breast cancer, particularly at very high doses.

Seek medical advice if you have a history of:

- liver disease
- acute porphyria (a hereditary metabolic disorder)

Progesterone tablets

The tablets often have the brand name Utrogestan, Progebel or Cyclogest and come in doses of 100 mg or 200 mg per tablet.
They are quite hard on the liver when swallowed (oral intake). The drug then enters the bloodstream via the liver. It is better to let the tablet melt under the tongue (sublingual) or in the cheek (buccal intake) so that more is absorbed into the bloodstream. Some pills can also be inserted into the anus (rectal intake). This is also less hard on the liver.

Dose: Low: 100 mg per day

Average: 200 mg per day

High: 400 mg per day

Progesterone injections

Progesterone injections are often sold under the brand name Prolutex in Dutch pharmacies. The packaging contains a number of small vials, each containing 1.11 ml of liquid and 25 mg of progesterone per vial. Larger vials from

other brands are sometimes available on the unofficial market. The average dose is 25 mg per day. Progesterone injections must be administered daily to be effective. Taking a larger dose in one go does not work. Many people find daily injections unpleasant, which is why progesterone is rarely used as an injection.

Other options

There is a lot of advice on the internet about supplements, herbs, combinations of medication and intake rhythms, particularly with the aim of increasing breast growth. There is no evidence for these things. The only thing you need is estrogen levels in the blood between 367 and 734 pmol/l and testosterone levels below 3 nmol/l. Nothing else has been proven to increase breast growth.

If you want less breast growth, there are a few options that may help. We list them below. All of these options are experimental. Little research has been done on the effectiveness and risks of these substances. Read up on them carefully if you are considering these methods.

Selective estrogen receptor modulators (SERMs)

SERMs are medications that have most of the effects of estrogen but do not stimulate breast growth. They do not suppress testosterone production and must therefore be combined with testosterone inhibitors. Well-known SERMs include raloxifene (brand name Evista), tamoxifen (brand name Nolvadex) and toremifene (brand name Fareston). Each drug has its own side effects and risks. Read up on them carefully if you are considering using them. SERMs are often combined with a small amount of estradiol.

Side effects of SERMs include menopausal symptoms such as hot flushes, night sweats, mood swings, fatigue and feelings of depression. They increase the risk of cardiovascular disease and liver damage. The use of SERMs also increases the risk of osteoporosis. It is advisable to take vitamin D supplements, exercise regularly and get enough calcium through food or supplements. The risk of thrombosis is also increased. When using SERMs, it is recommended to take a low dose of estradiol. With long-term use, it is advisable to ask your doctor to prescribe a bone scan every 5 years to check for osteoporosis.

DHT cream

If you are taking estrogen, you can apply dihydrotestosterone (DHT) cream to your breasts. This may inhibit breast growth, but will not completely prevent growth in everyone. DHT cream causes hair growth where it is applied (except on the head, where it causes hair loss). This is therefore only a suitable method if you do not mind hair growth on your chest. DHT cream is hardly sold anywhere outside France, so it can be difficult to obtain. Very little research has been done on the use of DHT cream to prevent breast growth, so little is known about its effectiveness and risks.

5. Hair and medication

Gender-affirming hormone treatment affects the hair on your head and body. Testosterone causes beard growth and body hair and can cause baldness. Low testosterone levels due to estradiol (sometimes in combination with a testosterone blocker) reduce the thickness of beard growth and body hair and prevent further baldness (estradiol sometimes also causes some regrowth of lost head hair). There are a few additional medications that can influence hair growth.

Finasteride

This drug is available as a 1 mg or 5 mg tablet. When used to treat baldness, between 1 and 2.5 mg per day is taken. The 5 mg tablet is therefore halved with a pill cutter. Finasteride is available on prescription from your GP or through unofficial channels. GPs regularly prescribe it to cisgender men who are going bald, so if you want this medication, it is definitely worth checking whether you can get it on prescription.

Finasteride blocks the substance dihydrotestosterone (DHT).

> **Dihydrotestosterone (DHT):** a form of testosterone that contributes to baldness, but can also affect beard growth and clitoris growth.

When DHT is completely blocked, hair loss stops. This is usually achieved after 4 to 6 months of using Finasteride. During those first few months, you may experience increased hair loss. Finasteride does not cause regrowth of lost hair.

If you stop taking Finasteride while your testosterone level is above 4 nmol/l, balding will resume. If your testosterone is

permanently high, you will need to take this medication for the rest of your life to maintain your hair.

As with any medication, Finasteride can cause side effects. The most common are: reduced libido, erectile dysfunction, mood swings, depression. There are indications that Finasteride increases the risk of depression.

No research has been conducted into the effect of Finasteride on trans men. Research on men with an intersex condition indicates that Finasteride may have a negative effect on beard growth and clitoris growth. If these things are important to you, this medication may not be the right choice for you.

Minoxidil

This medication is available as a spray, cream or pill and can be purchased without a prescription at specialised pharmacies and online shops. It promotes blood flow to the capillaries, causing new hair to grow. The spray or cream causes hair growth where it is applied. The pill promotes hair growth in all areas where you have capillaries (head, beard, body). The effectiveness of Minoxidil varies greatly. Some people experience significant hair growth, others little, and some none at all. It takes about 9 months to a year before you know what your results will be. If you stop using Minoxidil, the hair will fall out again. You will therefore need to take this medication for the rest of your life to maintain your hair.

Like any medication, Minoxidil can cause side effects. The most common are: skin irritation, skin flaking, itching, redness, rash, inflammation, eye irritation, eczema, headache, shortness of breath, depression, muscle pain and hair growth in places other

than where the product was applied. Seek medical advice if you have a history of cardiovascular disease.

Minoxidil makes the skin extra sensitive to burns and does not mix well with oily substances such as sunscreen or hair wax.

Minoxidil is **highly toxic to pets**, especially cats, but dogs and other pets can also become very ill from it. If you have pets, it is very important to keep the product away from them and to wash your hands thoroughly after use. If your pets come into contact with your head, it is advisable not to use the spray or cream.

Other options

There is a lot of advice on the internet about supplements, herbs and remedies for baldness or for regrowing lost hair. There is no evidence for most of these and some of these carry high risks.
It may be worthwhile to visit a good hairdresser or hair stylist who will take the time to find a hairstyle that suits you. Learning about your hair type and how to best care for it can also help.

You can also get tested to see if you have a deficiency in vitamins B2, B8 (biotin) and K2. Biotin in particular is often promoted online as a hair growth remedy, but if you do not have a deficiency in these vitamins, there is no point in taking extra doses. Please note: taking a high dose of **biotin can make blood tests unreliable.** If you are taking this supplement, stop taking it 5 days before your blood test. Biotin is found in many multivitamins.

Want less hair in certain areas? You can achieve permanent results with laser hair removal or electrolysis. It is best to have this done at a clinic, where they have the right equipment. Home hair removal devices often work very poorly, are not a permanent solution and can sometimes even be dangerous.

6. Blood tests

Blood tests are the most reliable way to check the effect of the hormones you are taking. With blood tests, you can:

- **see whether the dose of hormones you are taking is being absorbed by your body in the right amounts.** In practice, an average or 'standard' dose is sometimes too much for one person and too little for another, because our bodies process medication differently.
- **see if the medication you are taking affects the rest of your health**, for example your liver, kidneys and thyroid. You can also see factors that increase your risk of cardiovascular disease.
- **find explanations for symptoms you are experiencing.** Are you feeling unwell and think it might be related to the hormones you are taking? A blood test can often reveal if something is wrong.

Blood tests are important for everyone, but they are especially important if you:

- have health problems
- take other medication in addition to hormones (including supplements)
- use substances that have not been thoroughly researched or combine substances
- use testosterone inhibitors
- take a dose of hormones that is unusual or far from the 'standard dose'

When to test?

Most gender teams perform a comprehensive blood test before you take hormones for the first time. This is called a **baseline** measurement**.** This has a few advantages:

- If you have medical problems that are not visible externally but are visible in your blood values, you will discover this before you start taking hormones.
- If you have your first blood test after starting hormones, you will not only know what your values are, but also how much they differ from your starting point. This can be useful in determining your dose.
- If you only take your first blood test after starting hormones and notice a health problem, you will not know whether this problem was already present before you started hormones and whether your hormone use has had an impact on it.

However, not all doctors perform a baseline measurement. Some doctors do not consider it necessary for young, healthy patients.

After starting hormones, tests are done **every three months** for the first few months. If your blood values remain stable, after a year the tests are done **every six months** and eventually **once a year**. This longer interval between tests is only done if your blood values and health are stable and if you do not change your medication. If you change your medication or dosage, it is advisable to resume testing every three months. Would you like to see the effect of a different dosage quickly? In most cases, you can test after one month. This is not recommended for long-acting substances such as Nebido and Estradiol Undecylate.

Keep in mind that a blood test is **a snapshot**. It shows what is in your blood at the time of the test. This is important if you inject hormones, because a few days after injecting hormones, you will have high levels in your blood, which will slowly decrease. Just before your next injection/dose, your levels will be at their lowest. To accurately measure whether your blood levels are stable, it is important to take your blood test at the same time in your injection cycle. Many people choose to take a blood sample just before their next injection, so they are testing the lowest level. If you take hormones daily, for example via pills, gel or patches, the time of testing is less important. If you melt pills under your tongue or in your cheek, do not take a blood test shortly after taking them.

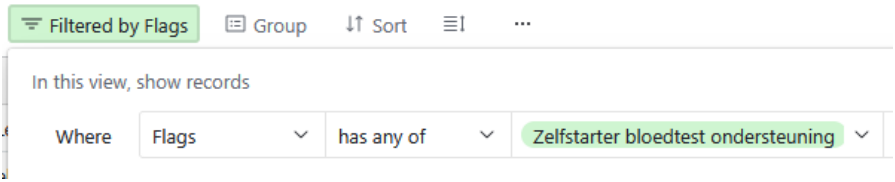
Where can you get a blood test?

Blood tests via your general practitioner
Your GP can write you a referral for a blood test. This is covered by health insurance in the Netherlands, but you will have to pay the 'eigen risico' charge. Your GP will interpret the results for you. Some GPs do not want to prescribe blood tests to people who are starting hormone treatment by themselves, or do not feel qualified to do so. Trans in Eigen Hand, together with the NHG Expert Group on Sexology, Transgender Care Utrecht and Transvisie, has developed a manual for GPs.

Tip: Trans in Eigen Hand manual for GPs
https://transineigenhand.nl/zorgverleners/GPs/

If your GP refuses, you can also search for a GP who is willing to help you at Trans in Eigen Hand:

Tip: Trans in Eigen Hand list of GPs. Click on 'filter' at the top of the table, select 'flags' and 'self-starter blood test support'. https://transineigenhand.nl/voor-transgender-personen/landkaart



Blood tests from a private clinic

If you cannot get a blood test from your GP, you can also go to a private clinic. This is often quite expensive, but just like with your GP, a medical professional will review the results with you.

Ordering online

You can also order a test online. You will have to pay for this yourself. You will have to interpret the results yourself, as there will be no medical professional involved. A test ordered online is less reliable, because you do not know whether the test meets quality standards. Often, the blood is tested in a laboratory that also works for GPs and hospitals and performs good tests, but this is not always the case.

Your blood test in steps

1. **Determine which tests you need**. We explain this in the next part of this chapter.

2. **Obtain a referral** from a doctor or order a blood test online.

3. **Make an appointment at a blood collection centre**. Some blood collection centres also have walk-in hours, where you can go without an appointment.

4. **Stop taking vitamins and dietary supplements 5 days before your blood test**, as these can affect the results. The sports supplement creatine and vitamin B8 (biotin) are known to cause inaccurate blood test results. Biotin is found in many multivitamins. If you are taking medication or have an illness, your pharmacist or doctor can advise you on how this may affect your blood test. Also check whether you need to be 'fasting' for your appointment. If so, you should not eat or drink anything except water for 12 hours before the blood test.

5. **Bring your referral letter and proof of identity** to the appointment. If you ordered a blood test online and received a **test kit** by post, bring that with you too.

6. **Identity check:** when it is your turn, your referral and identity will be checked first. Are you nervous or do you faint easily? Inform the care provider about this.

7. **The blood test:** first, a compression band will be placed around your upper arm. The care provider will then insert a needle into one of your veins, usually on the inside of your elbow. This needle is connected to a connector, which can be used to fill several tubes. Once the tubes are full, the care provider will remove the needle from your arm and apply a plaster or cotton wool to the puncture site. If you have received a test kit by post, you will take

the tubes home with you and send them to the laboratory yourself. This is not the case for all tests requested online. Sometimes the blood collection centre will take your tubes to the laboratory.

8. You will usually receive **the results** after a few days to a week. With an online service, it may take a little longer. At a GP or clinic, you can often view your results in an online file. If a GP or clinic assesses your results, you may only receive them after the doctor has reviewed the results and discussed them with you. **You have the right to see the full results of your blood test.** If your GP only says 'everything is fine', you can still request the full results to check for yourself.

What can you test?

There are many blood values that you can test. Most of them are not necessary when using hormones. We list the most important ones below. After that, we provide an overview of what is best to test for different medications.

PLEASE NOTE: do your results differ significantly from the values we mention here? Then first look at the letters after the number. You may receive the results in a different unit than we mention here. For example, the amount of estrogen is usually given in pmol/l in the Netherlands, but sometimes in pg/ml abroad. That makes a big difference.

The blood values you test are often divided into groups. For example, if you test your LFT (liver function test), five values are tested that provide information about the health of your liver.

Hormones

These substances influence your transition. The values we mention below follow the care standards of Dutch gender teams. Whether these are the values that suit you is a personal matter. Do you want more or less? In chapters 3 and 4, under the heading 'determining the dose', you will find more information about the consequences and risks, so that you can make a choice that suits you.

Estradiol (E2): Estradiol is estrogen. Cisgender men have low levels of this, averaging 40 to 130 pmol/l. Cisgender women have a cycle in which their estrogen levels fluctuate greatly, averaging between 40 pmol/l and 1,380 pmol/l.

In a feminising transition, the aim is usually to achieve values between 367 and 734 pmol/l. Expressed in nmol/l, this is 0.367 to 0.734 nmol/l. Expressed in pg/ml, this is 100 to 200 pg/ml.

During a masculinising transition, the amount of estradiol in the blood will decrease naturally, but you don't really need to pay attention to this. As long as testosterone levels are high enough, the masculinisation will proceed smoothly.

Testosterone (T): cisgender women have low levels of this hormone, averaging 0–2.8 nmol/l. Cisgender men have an average testosterone level of 11–35 nmol/l.

In a feminising transition, the goal is usually to achieve less than 3 nmol/l of testosterone. Expressed in ng/dl, this is 50 ng/dl. Beyond 3 nmol/l, lower testosterone does not give additional benefits. 0 nmol/l is not better for you and often causes more side effects, especially a decrease in sex drive and erections. It is advisable to stay above 1 nmol/l.

In a masculinising transition, the target is 10-30 nmol/l testosterone. In ng/dl this is 288 - 865 ng/dl.

Estradiol and testosterone are the most important values to test. Some gender clinics only test other hormone values in exceptional cases, for example, if there are specific complaints.

DHT: Dihydrotestosterone. This is a form of testosterone that affects baldness, body hair growth and libido. Cisgender women have low levels of this, averaging 0.03-0.30 nmol/l. Cisgender men have higher levels as they age, between 0.9 and 2.9 nmol/l.

SHBG: Sex Hormone Binding Globulin. This shows how many hormones are currently present in your blood. Normal values vary by age.

18-39 years	0 - 2.0 ng/ml	60-69 years	0 - 4.5 ng/ml
40-49 years	0 - 2.5 ng/ml	70+ years	0 - 6.5 ng/ml
50-59 years	0 - 3.5 ng/ml		

Progesterone: This hormone regulates the growth of the uterine lining. In cisgender women, this varies between 0 and 60 nmol/l during the cycle. Cisgender men produce very little: 1 - 3 nmol/l. In a feminising transition, this value is only relevant if you are taking progesterone. In a masculinising transition, the amount of progesterone will decrease naturally.

Prolactin: This hormone stimulates milk production and inhibits ovulation. In cisgender women, its level varies between 0 and 22 µg/l during the cycle. Cisgender men produce very little prolactin, less than 0.15 µg/l.

FSH: follicle-stimulating hormone. This stimulates, among other things, egg maturation, sperm production and the production of estrogen and testosterone. In cisgender men and women, the normal value is 1 - 20 E/l. People who ovulate may have very high FSH levels for a short period of time.

LH: luteinising hormone. This stimulates ovulation and the production of testosterone. In cisgender women, this varies between 1 and 100 E/l during the cycle; in cisgender men, the normal value is 1.7 to 15 E/l. People who ovulate may have very high LH levels for a short period of time.

Estradiol use lowers your FSH and LH levels. This is no cause for concern. If you use a gonadotropin-releasing hormone (GnRH) agonist such as Buserelin or Triptoreline as a testosterone blocker, your FSH levels will drop significantly.

CBC – complete blood count

This is a group of tests consisting of:

WBC: White Blood Cell Count. The number of white blood cells. This averages between 3.8 $x10^9$ /l and 10.6 $x10^9$ /l.

RBC: Red Blood Cell Count. The number of red blood cells. In cis women, this averages between 3.8 $x10^{12}$ /l and 5.2 $x10^{12}$ /l, and in cis men, this averages between 4.2 $x10^{12}$ /l and 6 $x10^{12}$ /l.

HGB: Haemoglobin. This is the protein in red blood cells that binds to oxygen and CO2 in your blood. In cis women, this averages between 7.5 and 10 mmol/l, and in cis men, this averages between 8.5 and 11 mmol/l.

HCT: Haematocrit. In cis women, this averages between 0.36 and 0.47 l/l, and in cis men, it averages between 0.41 and 0.50 l/l. If your haematocrit is higher than 0.52, it is important to see your GP because of the risk of blood clotting.

The standard values for the complete blood count are different for cisgender men and women. Before you start taking hormones, your values are likely to be close to those of the gender you were assigned at birth. Hormones cause your standard values to shift

slowly. After 1.5 years of testosterone use, your standard values will be in the same range as cis men. Those who use estrogen will have standard values in the same range as cis women after 1.5 years.

LFT – liver function test

This test does not directly check the functioning of your liver, but tests the amount of substances in your blood that may indicate problems in your liver. Namely:

ALAT: this is an enzyme that is mainly found in the liver. If your liver is damaged, the damaged enzymes leave your liver and enter your bloodstream. Normal: 7 to 56 IU/l. The value IU/l (international unit per litre) is sometimes written as IE/l. This means the same thing. It is not a problem if the values are somehat outside the normal range, but if they are much too high, for example around 150 IU/l, this may indicate liver damage.

ASAT: this is also an enzyme that is mainly found in the liver and enters your bloodstream in the event of liver damage. Normal: 0-35 IU/l. It is not a problem if the values are sometimes outside the normal range, but if they are much too high, for example around 100 IU/l, this may indicate liver damage.

The ASAT-ALAT ratio is also important. If your ASAT is higher than your ALAT, this is a clear sign of liver damage.

AF/ALP: this enzyme is found in your liver, bones, kidneys and digestive system and enters your bloodstream if one of these organs is damaged. Normal: between 30 and 120 IU/l.

Gamma-GT: this is a digestive enzyme; too much of it in your blood can indicate a problem with your gallbladder. Normal: less than 55 IU/l.

Albumin: this is a protein in your blood. Albumin is produced by the liver. Normal: 33 to 55 g/l. If this value is elevated, it is often due to dehydration and you simply need to drink more. If your albumin is too low, this may indicate damage to the liver or kidneys.

If your liver values are abnormal and there is a risk of liver damage, it is important to consult a doctor as soon as possible. A healthy liver is extremely important because, together with the kidneys, it protects you from harmful substances in your body.

Cholesterol

Cholesterol is a fat that is produced from food. Good cholesterol levels are important for keeping your risk of cardiovascular disease low.

Total cholesterol: the total amount of cholesterol in your body. Normal: 1.5 - 6.5 mmol/l. If this value is too high, you have an increased risk of cardiovascular disease.

HDL: this is also known as 'good cholesterol'. It is the molecule that transports cholesterol from your body to your liver. Normal: 0.9 - 1.7 mmol/l.

LDL: this is also known as 'bad cholesterol'. It is the molecule that transports cholesterol from your liver to your cells. Normal: 2.0 - 4.5 mmol/l. If this is too high, you have an increased risk of cardiovascular disease.

Total cholesterol/HDL ratio: total cholesterol divided by HDL must be less than 8, otherwise you have an increased risk of cardiovascular disease.

Triglycerides: these are substances that bind fatty acids and hold them together. Too many triglycerides can indicate an increased risk of cardiovascular disease. Normal: 0.6 - 2.2 mmol/l.

If your cholesterol levels are too high, you do not need to see your doctor immediately. High cholesterol is mainly a problem in the long term, but you can do a lot to lower your cholesterol by eating healthier. For example, eat less saturated fats such as butter, fatty meat, pastries and fried foods, and eat more unsaturated fats such as olive oil, nuts and oily fish. You can find a lot of information about low-cholesterol foods on the internet. What you need exactly varies from person to person. Is your cholesterol still too high despite eating healthier? Then you can discuss with your doctor whether medication is necessary. Also consult your GP if cardiovascular disease runs in your family, or if you have a history of cardiovascular disease yourself.

Thyroid hormones

Your thyroid gland regulates your metabolism and energy levels. The group of thyroid values that you can test consists of:

TSH: thyroid stimulating hormone. This is produced by your pituitary gland. TSH signals your thyroid gland to start producing thyroxine. Normal: 0.4 - 4.0 mIU/l. If your TSH is very high, it means that your thyroid gland needs a lot of stimulation. In that case, your thyroid gland is usually working too slowly. If your TSH is very low, your thyroid gland needs little stimulation. In that case, your thyroid gland is usually working too quickly.

Total T4: thyroxine, the substance that stimulates metabolism, blood flow and body temperature. Normal: 65 - 154 nmol/l.

FT4: also known as 'free T4', this is the amount of thyroxine that is currently active in stimulating your cells to metabolise. Normal: 9

- 24 pmol/l. The rest of your 'total T4' is currently inactive and functions as a reserve.

If your thyroid gland is not working properly, you will often notice unpleasant symptoms.

If your thyroid is overactive: feeling agitated or anxious, palpitations or irregular heartbeat, weight loss, feeling hot, excessive sweating, feeling shaky, weakness, clammy skin, hair loss, brittle nails, irritated eyes.

If your thyroid gland is underactive: fatigue, weight gain, feeling cold, dry hair, hair loss, hard stools, dry skin, difficulty concentrating, easily distracted.

Do you have no symptoms, but are your thyroid levels too high or too low? Then a thyroid problem may be developing. You can discuss this with your GP. Often, more tests are needed to determine exactly what is going on, and medication is ultimately prescribed to help your thyroid. Sometimes, thyroid testing reveals an autoimmune disease or hereditary condition.

Other

Below are a number of blood values that are not divided into groups.

Creatinine: this is a waste product from used energy. If your creatinine is too high, it may indicate kidney dysfunction. Normal: 45 - 100 µmol/l. µmol is also written as micromol.

eGFR: this shows the filtration rate of the kidneys. In a healthy adult, this is above 90 ml/minute or higher. A low eGFR may indicate kidney failure. The eGFR decreases with age. At the age of 80, the normal value is approximately 60 ml/minute.

Glucose: this substance measures the amount of blood sugar. This value must be measured on an empty stomach. The normal value is 4.5 - 8 mmol/l.

HbA1C: this substance affects long-term blood sugar levels. In people without diabetes, the normal value is 20-42 mmol/l. In people with diabetes, anything below 53 mmol/l is normal.

PSA: this is a protein secreted by the prostate, and the value changes with age. A significantly elevated PSA level may indicate prostate cancer. It is useful to have this tested if you have a prostate, are over 40 and are starting a feminising transition. Is your PSA level elevated ? Don't panic! In most cases, prostate cancer is not that dangerous. Do see your GP. PSA testing is not relevant if you do not have a prostate.

Tip: There is also a lot of information about blood values on the Principle17 website.
https://principle17.org/wp/belangrijke-bloedwaarden-als-je-hormonen-gebruikt/

When should you get tested?

Opinions differ on what you should test. Doing a lot of testing provides a lot of information, but can also cause unnecessary concern. Hormones rarely cause serious side effects. If your results are slightly outside the normal range, this is usually no cause for panic.

The Trans in Eigen Hand manual for general practitioners gives only one recommendation for all check-ups: haemoglobin, haematocrit, glucose, creatinine, cholesterol, testosterone, and estradiol.

Below, we provide an overview of what is often tested as a baseline measurement and during check-ups every 3 months, using abbreviations for each substance. The list below is an indication, but you can make your own choices or consult with your doctor.

Baseline before starting testosterone: CBC, testosterone (T), estradiol (E2), FSH, LH, HbA1C, TSH and FT4.
When using testosterone, always test: CBC, E2, T.
Test occasionally: LFT group, LCHC, creatinine, SHBG, albumin, vitamin D, prolactin, FSH, LH.

Baseline before starting estradiol: FSH, T, E2, prolactin, HbA1C, TSH, FT4.
When using estradiol, always test: E2, T.
Test occasionally: CBC group, SHBG, albumin, prolactin, FSH, DHT.

When using estradiol with cyproterone, always test: E2, T, LFT group, prolactin.
Test occasionally: CBC group, vitamin B12, SHBG, albumin, FSH, DHT.

When using estradiol with spironolactone, always test: E2, T, creatinine.
Test occasionally: CBC group, SHBG, albumin, prolactin, FSH, DHT.

When using estradiol with bicalutamide, always test: E2, T, LFT group.
LFT is particularly important in the first few months of use.
Test occasionally: CBC group, SHBG, albumin, prolactin, FSH, DHT.

When using estradiol with a GnRH antagonist such as Buserelin or Triptoreline, always test: E2, T.
Test occasionally: CBC group, HbA1c, SHBG, albumin, prolactin, FSH, DHT.

Are you using estrogen and continuing to lose your hair? Then test: T, E2, FSH, FT4, TSH, ferritin, folic acid, vitamin B12, HIV 1&2 antibodies, DHT, cortisol, HbA1c.

7. Medical calculations

If you purchase your own medication and determine your dose, you will occasionally need to perform medical calculations, for example if you want to adjust your dose or if you receive medication with a different concentration per ml than you are used to. This may sound difficult, but in practice it is not too bad and you can of course use a calculator. The most important calculations you need to know are:

Concentration x Volume = Dose

Dose / Concentration = Volume

Dose / Volume = Concentration

Example 1: calculating your injection
You have a bottle of testosterone cypionate with a concentration of 250 mg/ml. You want to inject 50 mg. How many ml should you inject? You want to know the volume in ml, so you use:

Dose / Concentration = Volume
50 mg / 250 mg/ml = 0.2 ml

You therefore need to inject 0.2 ml.

Example 2: a new bottle with a different concentration
You previously always had bottles of estradiol enanthate with a concentration of 40 mg/ml. You injected 0.13 ml of this per week. Your new bottle has a concentration of 50 mg/ml. How many ml should you inject now? To find this out, you first need to calculate the dose of your original injections.

Concentration x Volume = Dose
40 mg/ml x 0.13 ml = 5.2 mg

So you injected 5.2 mg before. Now you want to know what volume you need to have a dose of 5.2 mg again at a concentration of 50 mg/ml.

Dose / Concentration = Volume
5.2 mg/ 50 mg/ml = 0.104 ml

You therefore need to inject 0.104 ml, which you can round off to 0.1 ml.

Example 3: changing injection fluid

You previously always had a bottle of estradiol enanthate with a concentration of 50 mg/ml. You injected 0.14 ml of this per week. You have switched to estradiol valerate with a concentration of 40 mg/ml. You must inject this every 5 days. To know the correct dose, you must first calculate the dose of your original injections.

Concentration x Volume = Dose
50 mg/ml x 0.14 ml = 7 mg

So you injected 7 mg per week. Next, convert this to a daily dose.

7 mg per week / 7 days = 1 mg per day
1 mg per day x 5 days = 5 mg per 5 days.

So you want to inject a dose of 5 mg estradiol valerate every 5 days and now you just need to calculate the volume.

Dose / Concentration = Volume
5 mg / 50mg/ml = 0.1 ml

You therefore need to inject 0.1 ml.

With injection fluids purchased through unofficial channels, the concentration stated on the packaging is sometimes incorrect. That is why it is a good idea to always have a blood test after a few months when you switch from one injection fluid to another. This will show you whether you are really taking the correct dose.

If you switch from injections to another form of administration (e.g. pills, gel or patches), you cannot calculate a new dose in this way. Your body absorbs these substances differently. If you are aiming for average blood values, you will have to start with an average dose and have a blood test after a few months to see if you have the right dose for you.

Avoid mistakes in medical calculations

The most common mistakes are:

- Rushing and sloppy work. To be on the safe side, do your calculation at least twice, especially if you do not get the result you expect.
- Typing/writing down too many or too few zeros or putting a comma in the wrong place. Is the result suddenly much more or much less than you expected? Check your work.
- Mixing up units. The sums above are given with the concentration in mg/ml, the volume in ml and the dose in mg. However, the packaging may sometimes state the quantity in litres or grams. For example, a bottle of testosterone cypionate with a concentration of 250 mg/ml might be labeled as 0.25 g/ml. Pay close attention to this, otherwise you may suddenly have a thousand times too much or too little!

Are you unsure about the results of your calculations? Check your work for these errors and redo the calculation, or ask someone for help.

8. Self-injection

Administering an injection by yourself is not difficult, but it is important to learn how to do it properly and to pay close attention to hygiene and safety. We explain how to do this below. We also recommend attending a self-injection workshop or watching instructional videos online to see how it should be done.

Safety during self-injection

The most important thing with self-injection is to prevent infection. The human immune system is not good at fighting bacteria deep in our fat or muscles. If an infection continues to grow, it can enter a blood vessel. Infection in the blood is called blood poisoning or sepsis and it is life-threatening. That is why it is important to prevent infection and to recognise inflammation in time and seek medical help.

Injecting hormones usually causes mild symptoms at the injection site in the first few days after the injection, such as muscle pain, itching or a warm lump. These symptoms increase in the first 24 hours after the injection and gradually subside in the following days. This is a normal reaction of the body to an unknown substance and is not a sign of inflammation.

If you notice that your symptoms continue to increase after the first 24 hours, so that they are worse on the second day than on the first, worse again on the third day, and so on, this often means that an infection has developed. Other signs of inflammation include: white or yellow fluid leaking from the injection site, a large hot lump that tightens the skin, fever and a throbbing sensation.

Do you think you have an infection? Always see a doctor for antibiotics. This is the only way to fight the infection. Do not pinch or massage the area, etc. This does not help and can spread the infection.

Fortunately, infections are rare and can be easily prevented by working **hygienically** to ensure that no bacteria or molds enter your injection. The most important things to always do are:

- Wash your hands thoroughly with soap before you start.
- Work in a clean environment.
- Never share or reuse injection equipment. Only use new needles and syringes that are in sealed, clean packaging. Check the expiry date on the packaging and throw away old equipment or take it to the pharmacy for recycling.
- Before each injection, check the expiry date of your medication and examine the liquid. The injection liquid should be **transparent and colourless**, and there should be no impurities, specks, etc. visible.
- Disinfect the stopper of your medicine bottle with an alcohol wipe and disinfect the skin at the injection site with an alcohol wipe.
- Make sure your needle does not touch anything other than the disinfected stopper of your medicine bottle and the disinfected skin. If the needle touches something else, throw it away and take a new one.
- Dispose of needles immediately after use. Do this in a special needle container.

You can further reduce the risk of infection by making a conscious decision about how long you use a reusable medication bottle. From the moment you start using the bottle, a very small amount

of bacteria will inevitably enter your medication, even if you work very carefully. These bacteria will multiply. To slow down this process, medication contains a small amount of antibacterial substance, but this substance is only effective for a short period of time. The longer the bottle is open, the greater the chance that it will contain too many bacteria.

In hospitals, opened medication is used for a maximum of 28 days, because after that the number of bacteria might have grown so high that it poses a threat to weakened patients.

In self-medication communities, where most people have a well-functioning immune system, medication is often used for longer: sometimes 4 or 6 months, sometimes even longer. This increases the risk of infection. Consider for yourself whether you are willing to take this risk and, if so, where you draw the line.
Throwing away a half-empty bottle is obviously not pleasant, especially if you had difficulty obtaining the medication or had to pay a lot for it, but sometimes it is the safest option.

Medication mixed in a home laboratory can sometimes be less safe, for example because the ingredients supplied are less pure, because the home laboratory uses cheaper air filters than a large laboratory, or because the manufacturer does not have the expensive equipment to test every batch. Even a good, careful home producer encounters these limitations. Medication from a professional laboratory in a country with less stringent regulations or little control over the production process may also be less safe.

Tips to limit the risks:

- Make sure you know where your medication comes from. Ask around in the trans community whether others have had good experiences with this medication and check Transharmreduction.org to see if the products have been tested.

- Pay attention to the expiry date and do not use reusable medication bottles for too long. Store the bottle in a sealed container/box and clean the rubber barrier with an alcohol wipe before each use.
- Store the bottle in a clean environment at room temperature. Keep it away from sunlight.
- Check that the injection fluid is clear, has not discoloured and that there is nothing floating in it.
  When in doubt, discard it.

Preparing the injection

1. Wash your hands and gather your materials

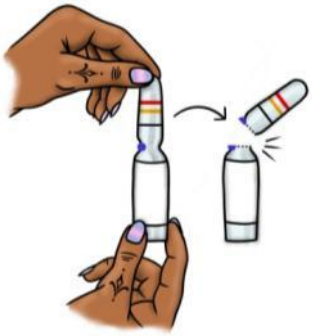
For your injection, you will need (unused, clean, in packaging and not past the expiry date):

- Your medication
- 2 alcohol wipes
- A syringe, usually 1 ml is a good size (except for Nebido)
- A needle to extract the medication from the vial, usually 25G and 2.5 cm long is a good size
- An injection needle: for an injection into the fat layer, 27G to 29G and 1.25 cm (0.5 inch) long is a good size; for an injection into the muscle layer, 23G to 25G and 2.5 cm (1 inch) or 3.7 cm (1.5 inch) is a good size
- A sharps disposal container for used needles

What is G?
G (gauge) indicates the diameter of a needle. The higher the G, the thinner the needle. The most common sizes are between 20G (fairly thick) and 30G (very thin).

2. Open the bottle

If you have a single-use glass vial, look for the dot on the neck. This is the break point. Turn the dot towards you. Hold the bottom of the vial with one hand and the top with the other. Snap the top off so that it breaks at the dot. The vial will then break without glass splinters. If you squeeze the top too hard, it may break. Your medication will then no longer be safe, as it may contain small glass splinters. Do not use this medication. In this case, also check your fingers for glass splinters. When breaking off the top of the bottle, you can hold it with gauze to protect your fingers.



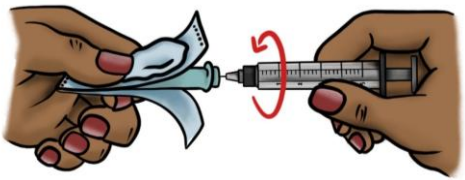
If you have a reusable bottle, remove the seal when using it for the first time. Sometimes this is a brightly coloured cap that you remove completely. Sometimes only the middle needs to be removed. Once you have removed the seal, do not put it back on.

Cap: Only the middle: Rubber barrier:

Once you have removed the seal, there is still a rubber barrier on the bottle. This protects the injection fluid from bacteria in the air. Therefore, never remove this barrier from the bottle. **Before each use, clean the rubber barrier with an alcohol wipe.**

3. Attaching the needle to the syringe:

Unpack the syringe. Open the bottom of the needle packaging. Be careful not to touch the needle; only hold the packaging. Press the bottom of the needle onto the syringe with the packaging still around it. Once the needle is firmly attached to the syringe, you can remove the packaging and the tube around the needle. Be careful not to let the needle touch anything.



4. Adding air to the syringe

If you are using a reusable bottle, add some air to the bottle each time you use it, approximately the same amount in ml as the amount of medication you plan to take out of the bottle. This is to keep the air pressure inside and outside the bottle equal. Pull the plunger up so that the syringe fills with air. Make sure you use clean air. Air that you can smell is not clean (even if it smells pleasant). Do not hold the syringe close to your mouth, as you will draw your breath into the syringe, which also contains many bacteria. If you have a single-use bottle, you can skip this step.

5. Drawing up the injection fluid

With a single-use bottle, insert the needle through the opening in the bottle. Make sure the needle is long enough to reach the bottom of the bottle and draw up all the liquid. Pull the plunger up and let the liquid flow into the syringe. Don't want to inject everything? Then look at the side to determine the amount and push the plunger back until you have the desired dose. Discard whatever remains in the bottle. You cannot save it.

With a reusable bottle, carefully insert the needle through the centre of the rubber barrier. Push the plunger down so that the air is injected into the bottle. Then turn the bottle upside down with the needle still in it. Make sure that the tip of the needle is submerged in the liquid. Then pull the plunger down so that the liquid flows into the syringe. Look at the side to determine the amount. You may pull the plunger further down so that the liquid flows in faster. Then push

the plunger back up until you have the desired dose. Once you have the desired dose, turn the bottle upright again and remove the needle.

Make sure there are no air bubbles in your injection fluid. If there are, you can tap the syringe until the air bubbles move to the top. Only do this if the drawing needle is still attached or without a needle, as it can damage the needle. Never tap the syringe if the needle you are going to inject yourself with is already attached.

6. Changing the needle

Take the needle you want to use for the injection and open the bottom of the needle packaging. Again, only hold the packaging. Remove the needle you used to draw up the liquid from the syringe and immediately dispose of it in the sharps disposal container. Press the bottom of the injection needle onto the syringe with the packaging still around it. Once the needle is firmly attached to the syringe, you can remove the packaging and the tube around the needle. Make sure that the needle does not touch anything. Push the plunger up slightly until a drop of injection fluid comes out of the needle. This tells you that there is no more air in the needle, and the needle will be lubricated by the drop of medication. This makes it easier to inject.

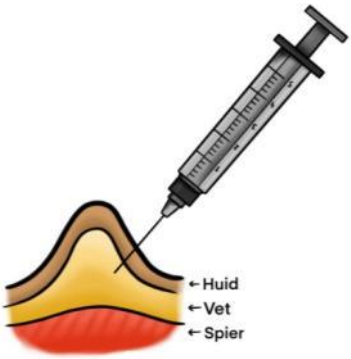
Injection into the fat layer (subcutaneous)

7. Clean the skin where you are going to inject with an alcohol wipe.

The easiest place for an injection into the fat layer is usually the abdomen. Stay at least 2 cm away from your navel, ribs and hip bone. You can also inject into the upper leg. Inject on the outside or top of the leg and stay about 10 cm away from the pelvis and knee. Do not inject in the same place every time. Find another spot on the abdomen or alternate between the left and right legs.

8. The injection

Injections into the fat layer are usually performed using a 27G to 29G needle that is 1.25 cm (1 inch) long. An injection into the fat is **between 0.5 cm and 1.3 cm deep.** To avoid accidentally pushing too deep, it is helpful to pinch a small section of skin and hold the needle at a slight angle.



Insert the needle into the cleaned skin and push the plunger down until all the liquid has been injected. Wait a few seconds before withdrawing the needle. Immediately cover the injection site with a cloth or your hand to prevent the liquid from

coming back out. Blood may come out of the injection site. If you want to protect your clothing from blood stains, you can put a plaster over the injection site. Massage the injection site for about a minute to spread the liquid, which will reduce skin irritation and muscle pain.

Dispose of the needle in the sharps disposal container and put the rest of the material in the general waste bin. You may also place the entire syringe and empty medicine bottles in the sharps disposal container. Other sharp objects such as razor blades may also be disposed of in the sharps disposal container.

Injection into the muscle layer (intramuscular)

7. Clean the skin where you are going to inject with an alcohol wipe.

The easiest place for an intramuscular injection is the upper thigh. Inject on the outside or top of the leg, keeping a distance of about 10 cm from the pelvis and knee. Some people inject into the middle of the outer buttocks (gluteal). This is more risky because you are close to the nerves of the spine and cannot see where you are injecting. For people without medical training, the upper thigh is safer.

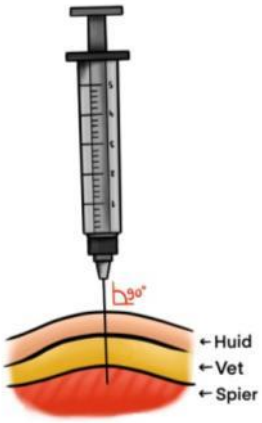
When injecting into the muscle, it is important to relax your muscles during the injection. If you are injecting into the thigh, it is best to sit on a high surface and let your legs hang over the edge. This will keep your feet off the floor and reduce the chance

of accidentally tensing your leg muscles. Do not always inject in exactly the same place; alternate between the left and right leg.

8. The injection

Injections into the muscle layer are usually given with a 23G to 25G needle that is 2.5 cm (1 inch) or 3.7 cm (1.5 inch) long. An injection into the muscle is **between 2.5 cm and 3.8 cm deep.**

To ensure that the needle goes in deep enough, insert the needle straight down. You can pinch a small area of skin when inserting the needle; many people find this helpful. Once the needle has penetrated your skin, release the skin to better determine the depth.



As you go down, you will feel that your body is not the same everywhere inside. Sometimes you will feel thicker or more sensitive areas. This is normal. When you reach the correct depth, pull the plunger up slightly. This is to check that the tip of the needle is not in a blood vessel. Is there red in the needle? Then you are in a blood vessel. In that case, adjust your injection depth slightly, but stay within the 2.5 and 3.8 cm range. If that does not work, pull the needle out completely, take a clean needle and continue. Do not forget to push the air out of the needle again until you see a drop coming out of the tip.

Are you not in a blood vessel? Then push the plunger down until all the liquid has been injected. Wait a few seconds before removing the needle from your body. Blood may come out of the injection site. If you want to protect your clothes from blood stains, you can put a plaster over the injection site. Massage the injection site for about a minute to spread the liquid. This will reduce skin irritation and muscle pain.

Dispose of the needle in the sharps disposal container and the rest of the material in the general waste. You may also place the entire syringe and empty medicine bottles in the sharps disposal container. Other sharp objects such as razor blades may also be disposed of in the sharps disposal container. You can return a full sharps disposal container to the pharmacy.

Additional tips

Do you find injecting stressful? Then this may help:

- Practise with a syringe filled with water on an orange.
- Choose a time when you are not tired and have enough time so that you do not have to rush.
- Develop a routine or ritual around injecting, such as putting on music that cheers you up.

Do you have a lot of muscle pain the day after your injection? Then these tips may help you:

- Take plenty of time to relax.
- Rest the injection site for a few hours after the injection. For example, do not exercise after the injection.
- Make sure the liquid is not too cold. If necessary, warm the bottle in your hands beforehand. Make sure it is never too warm. Do not put it in hot water, in the microwave or on the heater.

9. More information

Dutch

Trans in Eigen Hand
Manual for general practitioners
https://transineigenhand.nl/zorgverleners/huisartsen

Principle17
Overview of blood values
https://principle17.org/wp/belangrijke-bloedwaarden-als-je-hormonen-gebruikt/

Pharmacotherapeutic compass
Information about medicines and side effects
https://www.farmacotherapeutischkompas.nl

Apotheek.nl
Information about medicines and side effects
https://www.apotheek.nl

Thuisarts.nl
General information about illness and health
https://www.thuisarts.nl

English

The DIY HRT directory
https://diyhrt.wiki

Transfeminine Science
https://transfemscience.org

Trans Harm Reduction.org
Test medication from online shops and home laboratories.https://transharmreduction.org/hrt-testing

World Professional Association for Transgender Health (WPATH) - Standards of Care for the Health of Transgender and Gender Diverse People, Version 8. *International Journal of Transgender Health*, 23(S1), S1-S260.
The official manual of the world organisation for trans care, written for medical professionals.

Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society* Clinical Practice Guideline. *The Journal of Clinical Endocrinology & Metabolism*, Volume 102, Issue 11, 1 November 2017, Pages 3869–3903.
An official guide for and by endocrinologists.
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