

Harm Reduction

in

Self Medication



produced by

Action for Trans Health
London

A guide to estrogen and anti-androgens

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About This Guide

Action for Trans Health London is a grassroots organisation dedicated to improving transgender people's access to healthcare. We believe in free and accessible healthcare to trans people at all stages of transition. The barriers faced by trans people to effective healthcare are numerous, and this leads many people to seek help elsewhere.

The NHS provides treatment for trans people in the form of hormone prescriptions, surgery, hair removal and voice therapy, but it requires all patients to access this via a small number of over-subscribed and poorly managed Gender Identity Clinics (GICs). The NHS has a duty to provide care within 18 weeks, but average wait times for a first appointment at a GIC is around 2 years, and at least one additional appointment, sometimes more, are required for any treatment to be offered. The state of public trans healthcare is such that even the small number of private clinics have waiting times that are almost as long. Others are denied treatment after waiting years for an appointment, on grounds which are often discriminatory.

One of the most common ways in which transgender people seek alternative healthcare is by self-medicating. Self-medication generally consists of buying and taking hormones and/or hormone blockers from non-NHS sources. The trans community has rallied around the poor services offered by the NHS by educating itself and sharing as much information as possible about how to effectively and safely self-medicate, with the backing of current medical best-practice. There are also services available to help self-medicators monitor their hormone levels and organ functions. These will be discussed later on in this harm-reduction guide.

Action for Trans Health has produced this leaflet with the understanding that transition is a necessary step to living a fulfilling and healthy life, and that trans people will self-medicate with or without the necessary information to help them do it safely. In producing this guide, we do not advocate the use of unprescribed medication, but simply wish to help those who intend to use it safely.

If you are considering self-medicating, please do as much research as you can in order to understand the effects of the drugs you are taking. Make sure the drugs come in proper pharmaceutical packaging from reliable sources. Read the leaflets that come with medications in full, in order to learn about potential side effects and interactions.

The BNF is also a powerful tool for learning about drug interactions. It can be accessed online at <https://bnf.nice.org.uk/>.

Information on interactions with estrogen based medications is available here: <https://bnf.nice.org.uk/interaction/hormone-replacement-therapy.html>

Interactions for Cyproterone Acetate can be found here: <https://bnf.nice.org.uk/drug/cyproterone-acetate.html#indicationsAndDoses>

Interactions for Bicalutimide can be found here: <https://bnf.nice.org.uk/drug/bicalutamide.html#indicationsAndDoses>

Interactions for GNRH Agonists can be found here: <https://bnf.nice.org.uk/drug/triptorelin.html#indicationsAndDoses>

Please note that the doses recommended in the BNF are not necessarily appropriate doses for trans people. Even though these medications are routinely prescribed by medical professionals, their use in transgender patients is still technically considered off-label in the UK. In addition, many of the side effects associated with anti-androgens are actually side effects of not having sex hormones, and don't apply to trans people taking estrogen as well.

Summary of Estrogen-Based HRT

In trans women, assigned male at birth nonbinary people, and some intersex people, the preferred type of HRT is based around estrogen. For this guide, we will assume that the patient's body in its initial state produces high levels of testosterone (due to the presence of testes) and relatively low levels of estrogen.

In this kind of Hormone Replacement Therapy, there are two goals: gradually increasing the patient's estrogen levels to what is considered by the medical community to be the standard female range, 100–200 pg/mL, and decreasing the patient's testosterone levels to less than 50 ng/dL, also the standard female range.¹ This is a simulation of puberty, which is why gradual change is important. While it can be tempting to start at a higher dose, this can actually result in fewer changes (ie. smaller breasts).

The aim of this therapy is to reduce feelings of gender dysphoria. This can occur due to both the positive psychological effects of having the correct hormones, and also due to the physical changes which will gradually occur throughout the process. These changes include softening of the skin, changes in hair texture, changes in body odour, reduced sweating, breast development², broadening of the hips, general fat redistribution, changes in face shape, reduced physical symptoms of sex drive, reduction in body hair, reduction in the speed of hair growth.³

HRT of this kind leads to reduced fertility, and eventually to total infertility (if continued for years). If the patient is interested in having children who are

¹ Hembree WC, Cohen-Kettenis PT, Gooren L, Hannema SE, Meyer WJ, Murad MH, Rosenthal SM, Safer JD, Tangpricha V, T'Sjoen GG (November 2017). "[Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline](#)" (PDF). *J. Clin. Endocrinol. Metab.* **102** (11): 3869–3903. doi:10.1210/jc.2017-01658. PMID 28945902.

² de Blok CJ, Klaver M, Wiepjes CM, Nota NM, Heijboer AC, Fisher AD, Schreiner T, T'Sjoen G, den Heijer M (February 2018). "Breast Development in Transwomen After 1 Year of Cross-Sex Hormone Therapy: Results of a Prospective Multicenter Study". *J. Clin. Endocrinol. Metab.* **103** (2): 532–538. doi:10.1210/jc.2017-01927. PMID 29165635.

³ Giltay EJ, Gooren LJ (August 2000). "Effects of sex steroid deprivation/administration on hair growth and skin sebum production in transsexual males and females". *Journal of Clinical Endocrinology and Metabolism.* **85** (8): 2913–21. doi:10.1210/jc.85.8.2913. PMID 10946903.

biologically related to them, then gamete (sperm) storage is recommended. This normally has to be paid for privately in the UK.⁴ However, many trans people either do not want children, or would prefer to adopt children, so for them this is not an issue.

Estrogen based HRT carried out with regular blood tests and health checkups is generally considered safe, however there are a few potential negative side effects that are worth looking out for. These include bloating, breast tenderness, swelling, nausea, leg cramps, headaches, depression and indigestion.

There are also some rarer more serious risks which include an increased risk of blood clots (especially deep vein thrombosis) and some types of cancer.⁵ Some testosterone blockers also carry the risk of liver problems, but regular liver function tests can be used to detect early warning signs for this.

Reduced testosterone dramatically reduces the risk of developing prostate cancer.⁶ The mental health benefits of appropriate HRT in trans people are also generally very positive.⁷

4 <https://www.nhs.uk/conditions/gender-dysphoria/treatment/>

5 <https://www.nhs.uk/conditions/hormone-replacement-therapy-hrt/side-effects/>

6 <https://www.cancerresearchuk.org/about-us/cancer-news/press-release/2017-11-04-low-testosterone-levels-linked-to-reduced-risk-of-prostate-cancer>

7 <https://medicalxpress.com/news/2016-02-positive-psychological-effects-hormone-therapy.html>

Estrogens

The standard choice for estrogen therapy in trans people under 40 who do not smoke tobacco is Estradiol Valerate, taken orally, which is often sold under the brand Proginova. Estradiol Valerate is preferable over other estrogen esters such as Estradiol Hemihydrate, because it has a long elimination half life (12-20 hours) meaning it stays in the body for a long period of time after it is taken.⁸ This results in more stable hormone levels, which normally leads to a more stable mood.

In cases where Estradiol Valerate is unavailable or unaffordable, estradiol hemihydrate is a safe alternative. It is advised that a dose of hemihydrate be split throughout the day (e.g. half in the morning, half at night, to compensate for the shorter elimination half life.

Avoid Conjugated Estrogens (such as Premarin)⁹ and Ethinyl Estradiol¹⁰, because these carry greater risks of blood clots and other problems than the two medications listed above.

If the patient is over 40 or smokes tobacco and is unable to stop, patch or gel based HRT is safer.¹¹

Dosage information about estrogen alone is provided below. If the patient is considering self medication, reading the chapter entitled Suggested Treatment Plan is recommended.

Oral Dosages

For oral estrogen therapy, a starting dose of 2mg per day is recommended (of either estradiol valerate, or estradiol hemihydrate).

⁸ Düsterberg B, Nishino Y (December 1982). "[Pharmacokinetic and pharmacological features of oestradiol valerate](#)". *Maturitas*. 4 (4): 315–24. doi:10.1016/0378-5122(82)90064-0. PMID 7169965.

⁹ Scarabin PY (December 2014). "Hormones and venous thromboembolism among postmenopausal women". *Climacteric*. 17 Suppl 2: 34–7. doi:10.3109/13697137.2014.956717. PMID 25223916.

¹⁰ Kuhl H (2005). "[Pharmacology of estrogens and progestogens: influence of different routes of administration](#)" (PDF). *Climacteric*. 8 Suppl 1: 3–63. doi:10.1080/13697130500148875. PMID

¹¹ <http://www.teni.ie/attachments/9ea50d6e-1148-4c26-be0d-9def980047db.PDF>

After about 4 months on this dosage, it can be increased to 4mg per day if the desired level has not been reached.

If after a year or so on the 4mg dosage, if estrogen levels are still low (relative to the range mentioned in the summary section), an increase to 6mg daily is possible.

Regular blood tests to check hormone levels and liver function are very important throughout this process. Every three months is recommended for the first year, and every six months after that.

Remember that a slow buildup in estrogen is better for the body than a sudden spike. Puberty generally takes a long period of time, and HRT should reflect this if significant bodily changes are desired by the patient.

If desired estrogen levels are still not obtained at 6mg oral dose, do not increase the dose further. It is recommended instead that the patient either switches to estrogen patches/gel, or combines patches/gel with oral estrogen. Oral estrogen above 6mg puts unnecessary strain on the liver.

Patches

A 50 microgram transdermal patch such as Estradot 50, Climara 50 or Estraderm 50 replaced twice weekly is roughly equivalent to 2mg oral estrogen therapy daily.

If starting patch-only estrogen therapy, begin with a 50 μ g patch replaced twice weekly.

For more information, please read the chapter entitled Suggested Treatment Plan.

Anti-Androgens

When taking estrogen-based HRT, it is usually necessary to accompany this with anti-androgens. There are a number of anti-androgens available, each with their own downsides and nuances. This section will deal with side effects, dosages, availability, and contra-indications. When starting HRT, you may find that you don't get on well with a particular medication, and wish to try another. This is perfectly normal, and it's important to find the one you get on best with. It is appropriate to start taking anti-androgens at the same time as estrogens.

GNRH Agonists

GNRH Agonists are a class of medications that can be used to suppress the functioning of the gonads (testes or ovaries). They do not differ based on the hormone which you intend to suppress. They work by over-stimulating the posterior pituitary gland, resulting in an initial increase in luteinizing hormone, followed by a sudden drop in its production.¹² Practically, this results in a increase in sex hormone levels for a period of about a week, followed by a significant drop in sex hormone production for around 11 weeks. GNRH agonists are delivered by injection every 12 weeks, but the precise duration of effect differs between individuals, meaning that it must be tailored to individual experience.

The most common GNRH agonist used by the NHS is Decapeptyl (Triptorelin). A standard dose is 11.25mg, every 12 weeks. Due to the initial increase in hormone production levels, it is considered best practice to accompany Decapeptyl with a prescription of Cyproterone Acetate 50mg for the first week, which does not have negative interactions with Decapeptyl.

Decapeptyl is typically prohibitively expensive to self medicators, and hard to obtain. It must be administered by injection to the buttocks, so this is another barrier to those who wish to use it for self medication.

¹² Magon N (October 2011). "[Gonadotropin releasing hormone agonists: Expanding vistas](#)". *Indian Journal of Endocrinology and Metabolism*. 15 (4): 261–7. doi:10.4103/2230-8210.85575. PMC 3193774. PMID 22028996.

For many, Decapeptyl is a long-lasting and effective method of blocking testosterone production. However, others have reported fatigue and/or negative impacts on their mental health as a result of this blocker.

Cyproterone Acetate

Cyproterone Acetate is an anti-androgen commonly used in hormone replacement therapy, as well as in the treatment of testosterone-sensitive prostate cancer. It can also be combined with Decapeptyl for management of an initial spike in hormone production.

It works by binding to the androgen receptor, and preventing androgens such as testosterone and its more potent form, DHT, from binding to the receptor.¹³ In individuals taking estrogen, a lower daily dose is usually sufficient to block testosterone compared to cisgender men, as it is complemented by the blocking effect of estrogen.¹⁴ The recommended starting dose differs depending on the form and dose of estrogen being taken, but a typical dose would be 50mg/day, to be increased to 100mg if the blocking effects are not sufficient.

While taking this medication, it is important to have six-monthly blood tests to monitor the functioning of the liver, as liver toxicity is a rare but possible reaction.¹⁵

The most common side effects reported by transgender women are increased urination frequency, and fatigue at doses higher than needed to block testosterone. In individuals with EDS or Hypermobility Syndrome, Cyproterone Acetate can increase joint hypermobility (and associated pain), as it has a progestinic effect. While it is not dangerous to take for affected individuals, another anti-androgen is preferred.

Cyproterone Acetate is widely available (except in the United States).

13 Figg W, Chau CH, Small EJ (14 September 2010). [Drug Management of Prostate Cancer](#). Springer. p. 71. ISBN 978-1-60327-829-4.

14 Fung, Raymond; Hellstern-Layefsky, Miriam; Lega, Iliana (2017). "Is a lower dose of cyproterone acetate as effective at testosterone suppression in transgender women as higher doses?". *International Journal of Transgenderism*. **18** (2): 123–128. doi:10.1080/15532739.2017.1290566. ISSN 1553-2739.

15 Neil Kaplowitz (16 October 2002). [Drug-Induced Liver Disease](#). CRC Press. pp. 618–. ISBN 978-0-203-90912-6.

Spironolactone

Spironolactone is an anti-androgen primarily prescribed in the United States, as medication licensing there prohibits the prescription of “foreign” medications if a US alternative is available.¹⁶ It is generally regarded as safe for the treatment of gender dysphoria, but it is a less potent anti-androgen¹⁷, and has greater side effects at effective doses than Cyproterone Acetate. In the UK, it is used almost exclusively by self medicators as it is cheaper than Cyproterone Acetate. Dosages in hormone replacement therapy typically range from 100mg/day to 400mg/day, and is most effective split in two (morning/evening).^{18,19}

Spironolactone functions by blocking the Androgen Receptor so that testosterone and DHT cannot bind to it.²⁰

The main health risk associated with Spironolactone is renal damage, and as such, six-monthly monitoring blood tests are recommended.²¹ The most commonly reported side effects by transgender women are significantly increased urination frequency, dehydration and low sodium levels.

Bicalutamide

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- 16 The World Professional Association for Transgender Health (WPATH) (2011). ["Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People"](#) (PDF). Archived from [the original](#) (PDF) on 2012-05-23. Retrieved 2012-05-27.
 - 17 Robert S. Haber; Dowling Bluford Stough (2006). [Hair Transplantation](#). Elsevier Health Sciences. p. 6. ISBN 978-1-4160-3104-8. Archived from the original on 4 July 2014. Retrieved 28 May 2012.
 - 18 Hembree WC, Cohen-Kettenis PT, Gooren L, Hannema SE, Meyer WJ, Murad MH, Rosenthal SM, Safer JD, Tangpricha V, T'Sjoen GG (November 2017). "Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline". *J. Clin. Endocrinol. Metab.* **102** (11): 3869–3903. doi:10.1210/jc.2017-01658. PMID 28945902. *Hormone Regimens in Transgender Persons. Transgender females. Antiandrogens. Spironolactone.* 100–300 mg/d.
 - 19 Wesp LM, Deutsch MB (March 2017). "Hormonal and Surgical Treatment Options for Transgender Women and Transfeminine Spectrum Persons". *Psychiatr. Clin. North Am.* **40** (1): 99–111. doi:10.1016/j.psc.2016.10.006. PMID 28159148. Table 3. Recommended antiandrogen dose. Drug: Spironolactone. Initial Dose (mg/d): 100. Maximum Dose (mg/d): 400. Comments: Usually divided into twice daily dosing. Pills come in 25, 50, or 100 mg doses and can be titrated up as tolerated. Taking earlier in day may prevent urinary frequency during night.
 - 20 Loriaux, D. Lynn (November 1976). "Spironolactone and endocrine dysfunction". *Annals of Internal Medicine.* **85** (5): 630–6. doi:10.7326/0003-4819-85-5-630. PMID 984618.
 - 21 David Goldsmith; Adrian Covic; Jonas Spaak (12 November 2014). [Cardio-Renal Clinical Challenges](#). Springer. pp. 167–. ISBN 978-3-319-09162-4.

Bicalutamide is an anti-androgen used in feminizing HRT and in the treatment of prostate cancer.²² It is considered safe and effective by the World Health Organisation.²³ It functions by blocking the Androgen Receptor so that testosterone and DHT cannot bind to it.²⁴ It is reported to have mildly estrogen effects. Its main difference from the other anti-androgens discussed previously, Cyproterone Acetate and Spironolactone, is that it has a longer elimination half life, meaning that it does not need to be taken as frequently.²⁵

For feminizing HRT, a suggested dose is 25mg every two days, or 50mg every four days. Many people find that taking it every 2 days rather than every 4 days leads to a more consistent dose and effective blocking. This is particularly important if the individual experiences negative emotional or physical effects from testosterone.

Bicalutamide is contraindicated for individuals with severe hepatic impairment.

22 Gooren, LJ (31 March 2011). "Clinical practice. Care of transsexual persons". *The New England Journal of Medicine*. **364** (13): 1251–7. doi:10.1056/nejmcp1008161. PMID 21449788.

23 "WHO Model List of Essential Medicines (19th List)" (PDF). World Health Organization. April 2015. Archived (PDF) from the original on 13 December 2016. Retrieved 8 December 2016.

24 Singh SM, Gauthier S, Labrie F (February 2000). "Androgen receptor antagonists (antiandrogens): structure-activity relationships". *Current Medicinal Chemistry*. **7** (2): 211–47. doi:10.2174/0929867003375371. PMID 10637363.

25 Cockshott ID (2004). "Bicalutamide: clinical pharmacokinetics and metabolism". *Clinical Pharmacokinetics*. **43** (13): 855–878. doi:10.2165/00003088-200443130-00003. PMID 15509184. These data indicate that direct glucuronidation is the main metabolic pathway for the rapidly cleared (S)-bicalutamide, whereas hydroxylation followed by glucuronidation is a major metabolic pathway for the slowly cleared (R)-bicalutamide.

Progesterone

People are sometimes interested in including progesterone in their hormone regimen. This is not necessary for the production or maintenance of feminization, but can lead to a hormone cycle more representative of that of cis women. It is common to introduce progesterone for several days out of every month.

It is commonly believed that progesterone increases breast development. There is no evidence to support this, although it does cause temporary breast swelling or tenderness.

When including progesterone in an HRT program, it is very important to distinguish between **progesterone** and **progestins**. Progestins are synthetic progesterone analogues, and typically have negative health effects for transfeminine people, with the exception of some anti-androgens (see anti-androgens section). Many transfeminine people try to use contraceptives as HRT, and suffer negative health effects as a result. Contraceptives usually contain progestins or a combination of progestins and estrogens. Though more widely available, this method can have very serious health impacts, and should be avoided at all costs.

When including progesterone in an HRT regimen, please ensure you are taking bioidentical progesterone and not progestins. A suitable daily dose would be 100mg/day. Two common brands of bioidentical progesterone are Prometrium and Utrogestan.

Progesterone is typically neutral or beneficial to health, however it does increase joint hypermobility in individuals with EDS or hypermobility syndrome, and so should be used with care.

Acquiring Hormones

The specifics of where to buy hormones is beyond the scope of this guide, as sources change regularly, and we do not advocate the use of unprescribed medications. However, it is relevant to discuss the general sources that self-medicators may use.

The most common source of medication is online pharmacies. These are typically licensed pharmacies operating legally, but often in countries where they are permitted to sell the medications without prescription. Other online pharmacies take the buyer through an online consultation and prescribe the medication they are dispensing. Other online shops, usually those specifically geared towards transgender people, buy medication directly from pharmacies in countries where this is possible, and then sell them online. Medication comes packaged in sealed blister packs, in the same brands as prescribed by the NHS and dispensed by UK pharmacies. This medication is legitimate and pure.

Other sources of medication include medication prescribed to other people, and buying medication from the darknet. Medication prescribed to other people is not usually a consistent source of medication, as usually becomes available only inconsistently when someone has spare. Darknet sources of medication are not very relevant to estrogen-based HRT because the drugs involved in HRT are not controlled substances.

Suggested Treatment Plan

This section draws on all of the information presented in the previous two sections to present several standard treatment plans, giving advice on both dose changes over the course of years, and demographic factors. It will not include options viewed as too hard to get for self-medicators.

Oral

This treatment plan is recommended for those under 40 who are non-smokers.

0-4 months

2mg Estradiol Valerate every day

25mg Bicalutamide every **2** days

4-12 months

4mg Estradiol Valerate every day

25mg Bicalutamide every **2** days

12+ months

4-6mg Estradiol Valerate every day, depending on individual needs

25mg Bicalutamide every **2** days

As costs and availability may differ, it is safe to change estradiol valerate for estradiol hemihydrate (often just called estradiol), at the same dose. If Bicalutamide is not available, this may be exchanged for 50mg Cyproterone Acetate **daily**. Bicalutamide may also be taken as 50mg every 4 days.

Patches

This treatment plan is suitable for those who are contra-indicated for oral estrogen, as well as those who require doses of estrogen greater than 6mg (oral).

0-4 months

50 μ g patch replaced twice a week

25mg Bicalutamide every **2** days

4-12 months

100 μ g patch replaced twice a week

25mg Bicalutamide every **2** days

12+ Months

The estrogen dose may be increased further, as needed.

25mg Bicalutamide every **2** days

Blood Test Monitoring

It is advised that people taking HRT regularly have their blood tested and monitored, to ensure that they are in good health. 3 monthly tests are recommended for the first year of treatment, and 6 monthly thereafter. Blood testing can be done by GPs, who are advised to offer blood tests to self-medicating transgender people. If your GP is not willing to cooperate, or you prefer another alternative, many sexual health clinics are able to test and interpret results. The sexual health clinic in London we recommend is CliniQ, a sexual health clinic dedicated to providing services to transgender and gender non-conforming individuals, though sadly it is not able to prescribe hormones at this time.

CliniQ can be found at 56 Dean Street, Soho, W1D 6AQ.

Blood tests must include liver and kidney function. It is also useful to test for estrogen, testosterone and DHT levels, in order to monitor their levels. However, it should be noted, that many anti-androgens do not cause a complete drop in testosterone levels, as they work by blocking androgen receptors rather than eliminating testosterone. Prolactin should also be monitored.