Understanding Adult Trans Masculine Hormone Therapy

Trans masc folks! If you are looking to have a better understanding of what gender affirming hormone therapy is all about, click here!

Disclaimer: Before we begin, It is important to understand that not all transgender people want to go through Gender Affirming Hormone Therapy (GAHT) or Hormone Replacement Therapy (HRT) and that is completely okay. After all, GAHT is only a small part of the trans experience, and you are not required to go through GAHT to be valid as a transgender individual.

It can be exciting to start GAHT and to have your gender affirmed physically, but it is equally important to be aware of what GAHT consists of, such as the types of medicines, the effects, long term preventative care and most importantly, the risks. This article covers the gist of it, but we recommend doing more intensive research, which you can start by referring to the 'further reading' portion of this guide.

The Primary Sex Hormones

Ok, let's begin with understanding the sex hormones. There are 2 to take note of.

Testosterone (an androgen) (Sometimes known as T in the trans community)	Primary sex hormone in developing male sexual characteristics.
Estrogen (Sometimes known as E in the trans community):	Primary sex hormone in developing female sexual characteristics.

Masculinising GAHT is all about increasing the level of testosterone so that it becomes the primary sex hormone. When T is taken in high doses via injection (usually), estrogen will be suppressed naturally.

Dosages for injected esters start off low, as recommended. After 3 months, a blood test is done at trough level (the lowest point just before your next T shot) to determine your total testosterone level. Total testosterone should be in the normal range of testosterone for cis men, between 5 to 32 nmol/L (based on reference ranges provided by BP Lab, a Malaysian based Health Screening Provider).

Note: Ranges will differ depending on age, so if you are a trans man that is over the age of 50, please seek the recommendations of a healthcare provider

When that range is reached, the masculinisation process will begin. You will know it's happening because your menstruation (premenopausal) will cease (usually between 3-6 months of starting T). If it doesn't stop, your dosage will be increased to within the upper range for cis men. In rare instances when this does not work, some gender clinics will test your estrogen levels to see if the T is actually being aromatised (converted) to estrogen. In this scenario, an aromatase inhibitor (defined below) is introduced.

Blood Tests

Before we proceed to medication, let's talk about the importance of blood tests. A blood test is the most definitive way of finding out if a hormone regimen is working for you, and if it is working safely based on your individual risk profile, pre-existing medical conditions, and medical history.

This table is the recommended bloodwork for monitoring masculinising hormone therapy

In this table, smaller and lighter grey "x"s indicate parameters that are measured under particular circumstances

Test	Baseline	3 months	6 months	12 months[c]	Yearly	According to guidelines for cis patients, or provider discretion
CBC[a]	X	X	X	X	X	
ALT/AST	X		X[d]			X
Fasting Glucose/ Hba1c	X		X[d]			X
Lipid profile	X		X[d]			X
Total Testosterone	X	X	X	X	X	
LH[b]	x			x	x	
Other	Hep B, C, pregnancy test					
	Consider: HIV, syphilis and other STI screening as indicated, frequency depending on risk					

a Male reference ranges should be used for Hb/Hct (lower limit of female range can be used if menstruating)
b Post-gonadectomy only: elevated LH may have implications regarding bone mineral density (See Osteoporosis and bone mineral density screening)
c During first year of treatment only
d Once at either 6 or 12-month mark

Note: Individual parameters should be considered more frequently if concerns are identified or existing risk factors are present.

Source: Rainbow Ontario's Guideline for Gender Affirming Primary Care (2019)1

Definitions
CBC (Complete Blood Count),
ALT (Alanine transaminase, Liver Risk),
Hba1c (Diabetes Risk),
Lipid Profile (Cholesterol, Cardiovascular Risk),

Total Testosterone(Free testosterone and testosterone that's attached to proteins)

LH (Lutenising Hormone, bone mineral density risk after surgery)

The Medications

Non Testosterone Medications

Aromatase Inhibitor

Aromatase Inhibitor (AI) is a class of drug used to reduce conversion from testosterone to estrogen due to aromatisation. It is used in cases where testosterone alone is unable to suppress estrogen.

5a-reductase inhibitor

Trans men are equally susceptible to scalp hair loss (male pattern baldness) and excessive body hair as cisgendered males. To slow down the process of balding and body hair growth, a 5a-reductase inhibitor can help. It is important to note that it can slow down or reduce certain aspects of the regimen, which is why it is usually recommended to start *after* the desired aspects of masculinisation have been achieved[2]. Propecia is the brand name for finasteride, a widely available form of 5a-reductase inhibitor. Some trans men, however, have noted a return of menstruation after taking finasteride, so please seek medical advice before starting.

Minoxidil is also a popular 5a-reductase inhibitor, sold in generic form or under brands like Rogaine or Foligain. It won't reverse balding or add to your hairline, but it will slow down the process. Inversely, some gender clinics prescribe minoxidil as a way to quicken facial hair growth[3]. It is applied directly to the beard area after the appearance of vellus hair aka peach fuzz.

Testosterone Medications

Injectable testosterone is usually the preferred method of administering testosterone, but there are also transdermal creams, gels and patches as well as oral variants.

Injectables

Injectable testosterone is compounded in oil allowing for a slower release, prolonging the action of the drug. There are a variety of different esters used and they all have different elimination half lives (the amount of time until half the administered dose remains in the body), costs, doses and frequency of administration.

Studies show that there is very little difference between intramuscular (IM, injected into the muscle) and subcutaneous (SC or SQ, injected into the fat). The good news is that they are both used with clinical efficacy and are very well tolerated. In some parts of the world, SC implants are used and inserted into the skin every 3 months.

Non Injectables

Transdermal patches, creams and gels are also safe and have good efficacy, but because these are applied to the skin, there's a risk of accidentally transferring it to someone else before the medication can be fully absorbed. This poses a serious risk to children, pets and pregnant folks.

Some parts of the world prescribe oral testosterone, but due to it encountering the first pass effect of the liver, the testosterone dose may be too low, making it ineffective for lowering estrogen in the body. It also worsens some adverse effects of testosterone, such as lowering your HDL cholesterol levels (the good cholesterol).

Some surgeons have advocated for the topical application of testosterone (or Dihydrotestosterone AKA as DHT) to the clitoris as an aid to clitoral growth prior to metoidioplasty (surgical reconstruction of the clitoris to create a phallus). There is no definitive evidence for this practice. However, if undertaken, the applied dose should be subtracted from the patient's total testosterone dosage. Take note that using DHT may accelerate male pattern balding and may affect testosterone dosage. Hence, usage of topical T for this purpose should always be done with the advice of a qualified physician.

Risks

There needs to be more long term studies done on GAHT and its risks in general to better understand long term risks associated with GAHT, but this is what we know so far.

The risks for cardiovascular disease is higher for those on masculinising GAHT, though the risk is lower than that of cis men[4]. Another study noted an elevated risk of heart attacks among self-identified trans men, though it did not include data on whether or not they are on GAHT and what type of regimen they use[5]. Cardiovascular risk can be minimised through lifestyle changes such as regular exercise, managing stress levels, not smoking, and not consuming alcohol. As mentioned above, blood tests can further monitor your risk levels, especially in the first year of GAHT.

There is a high amount of data suggesting a rise in hematocrit (production of red blood cells) associated with masculinising GAHT, which indicates increased short term risk for blood clots[6]. If you have a personal or family history of heart disease, please consult a physician.

One possible alternative is to switch to testosterone undecanoate (commonly known as Nebido) as an ester as studies have shown that there is less likelihood of developing increased hematocrit levels compared to other esters.

Common GAHT Regimens

These are the most common masculinising GAHT regimens. Parenteral (route of administration other than oral) methods are recommended and are usually more accessible.

Medication	Typical Dose
Testosterone enanthate (injections)	50–100 IM/SC weekly
Testosterone cypionate (injections)	100–200 IM every 2 weeks
Testosterone undecanoate (injections)	750 mg IM every 10 weeks
Testosterone gel (transdermal)	50-100 mg/day

Testosterone transdermal patch (transdermal)	2.5–7.5 mg/day

Table taken from WPATH v8

There are other non parenteral medications that are not listed here such as Sustanon which are a combination of different testosterone esters.

Timeline of Expected Changes

Effect	Expected Onset	Expected Maximum Effect	PermanentChanges
Skin oiliness/acne	1 – 6 months	1 – 2 years	
Facial/body hair growth	3 – 6 months	4 – 5 years	X
Scalp hair loss	6 – 12 months*	Variable	X
Increased muscle mass/strength^	6 – 12 months	2 – 5 years	
Body Fat Distribution	1 – 6 months	2 – 5 years	
Cessation of Menses	1 – 6 months	n/a	
Clitoral Enlargement	3 – 6 months	1 – 2 years	X
Vaginal Atrophy	1 – 6 months	1 – 2 years	
Deepened Voice	6 – 12 months	1 – 2 years	X

Adapted from: The Endocrine Treatment of Gender Dysphoric/ Gender Incongruent Persons: An Endocrine Society Guideline[7]

*Highly dependant on age and inheritance; may be minimal

^significantly depending on lifestyle and exercise

Conclusion

Check out the further reading portion below as there is always more to learn. Please also check out the preparation before starting GAHT resource, which is especially important if you don't have access to a trans friendly and experienced endocrinologist.

Further Reading

Another reminder that understanding GAHT is just one part of the trans experience, so check out our SOGIESC guide or how to come out to others about your gender identity

Wikipedia – A shorter simpler guide compared to the other recommendations with reliable sources.

Rainbow Ontario – has excellent guidelines on risk management and long term preventative care.

WPATH8 – Standard of practice; a lot of doctors will strictly rely on this as a guideline though it is looked at by some endocrinologists to be conservative in terms of best practices.

1. Rainbow Ontario Canada. *4th edition: sherbourne's guidelines for gender-affirming primary care with trans and non-binary patients,* Amy Bourns, p73, 2019 ->
2. Andrology. *Is there a role for 5?-reductase inhibitors in transgender individuals?,* Michael S. Irwig, August 2020. ->
3. Frontiers in Endocrinology. *Case Report: Successful Use of Minoxidil to Promote Facial Hair Growth in an Adolescent Transgender Male,* Kenneth C. Pang, Thomas P. Nguyen et al, September 2021. ->
4. Circulation. *Occurrence of Acute Cardiovascular Events in Transgender Individuals Receiving Hormone Therapy,* Nienke M. Nota, Chantal M. Wiepjes et al, Feb 2019. ->
5. National Library of Medicine. *Cardiovascular Disease Risk Factors and Myocardial Infarction in the Transgender Population,* Talal Alzahrani, Tran Nguyen et al, Apr 2019. ->
6. Andrology. *Prospective evaluation of hematocrit in gender-affirming hormone treatment: results from European Network for the Investigation of Gender Incongruence,* J. Defreyne, B. Vantomme et al. March 2018 ->
7. The Journal of Clinical Endocrinology & Metabolism. *Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society Clinical Practice Guideline*, Wylie C Hembree, Peggy T Cohen-Kettenis et al, September 2017. ->