FEMINIZING HORMONE THERAPY

The goal of hormone therapy in trans women is to reduce the endogenous effects of testosterone and to induce female secondary sex characteristics. Physiologically, this requires a suppression of endogenous androgens and the addition of estrogen. This treatment results in both reversible and irreversible feminization.[3]

ABSOLUTE CONTRAINDICATIONS

- Unstable ischemic cardiovascular disease
- Estrogen-dependent cancer
- End stage chronic liver disease
- Psychiatric conditions which limit the ability to provide informed consent
- Hypersensitivity to one of the components of the formulation

ESTROGEN

Estrogen acts directly on estrogen receptors to initiate feminization. It is usually the focus of hormonal transition for trans women. At SHC, oral estradiol (Estrace) is prescribed most often because it has a preferable safety profile compared to conjugated estrogen (e.g. Premarin), and is covered by the ODB program with an EAP request. Some report faster breast development with injectable estrogens. The starting dose of estrogen can be maintained for 1-2 months, after which a dose increase can be considered barring any concerning effects. In clients over 50 years old who have been on estrogen for several years, doses may be reduced to those administered to post-menopausal cis women (ie. 0.025 – 0.05 mg patch).

RELATIVE SAFETY

Transdermal estradiol seems to be safer than oral estradiol, have fewer hepatic side effects and is thus recommended for clients over 40 or with risk factors for cardiovascular or thromboembolic disease. [4]

PRECAUTIONS

All reasonable measures should be taken to reduce the risks associated with estrogen therapy.[5] Suggested measures to minimize risks associated with listed precautions may be found in the *Guidelines and Protocols for Hormone Replacement Therapy and Primary Health Care for Trans Clients*.

PREVENTIVE CARE

Trans women maintained on feminizing hormone therapy have unique preventive care needs and recommendations. An Adapted Preventive Care Checklist for trans women that can be used at the point of care can be found in the *Guidelines and Protocols for Hormone Replacement Therapy and Primary Health Care for Trans Clients*.

3. Levy A, Crown A, Reid R Endocrine intervention for transsexuals. Clin Endocrinol 2003; 59(4):409-18
4. Van Kesteren PJ, Asscheman H, Megens JA, Gooren LJ. Mortality and morbidity in transsexual subjects treated with cross-sex hormones. Clinical endocrinology. 1997; 47(3):337-343. Hembree, WC, Cohen-Kettenis P, Delemarre- van de Waal HA, Goore LJ, Meyer WJ, Spack NP, Tangpricha V, Montori VM. Endocrine treatment of transsexual persons: an Endocrine Society clinical practice guideline. J of Clin Endo & Metabolism. 2009; 94:3132-3154. doi: http://dx.doi.org/10.1210/jc.2009-0345
5. Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women: principal results from the women's health initiative randomized controlled trial. JAMA 2002; 288(3):321-333 doi:101001/jama2883 321

ANTI-ANDROGEN

Spironolactone has traditionally been used preferentially as it was thought to have a superior safety profile. This practice has recently come into question as it has been anecdotally noted that adequate anti-androgen effects are achievable at lower doses of cyproterone at which adverse effects are less likely. Thus the choice of anti-androgen should be made individually for each client based on their medical history and preference regarding respective side effect profiles. Following orchiectomy (+/- vaginoplasty), most trans women will not require androgen suppression. The androgen-blocker can be tapered over the course of 4-6 weeks.

Formulations and recommended doses of estrogens and anti-androgens

Formulations	Starting Dose	Maximum Dose	Cost* (4 weeks)
Spironolactone	50 - 100 mg OD	200 mg BID	$16.56[a] - $40.58[b]
Cyproterone	12.5 - 25 mg OD	50 mg OD	$32.98[c] - $101.92[d]
Conjugated Estrogen*	0.625 mg OD	1.25 mg OD	$20.01[e]
Estradiol (oral)*	1 - 2mg OD	4 mg OD	$18.53 - $40.14[f] **Covered by ODB with EAP request**
Estradiol Patch (transdermal) *[g]	0.1 mg OD / apply path 2x/week	0.2 mg OD / apply path 2x/week	$39.97 - $69.95[h]
Estradiol valerate injectable (IM)[i]**	10mg q 2/52	10mg q 1/52	$14.20 - $28.40

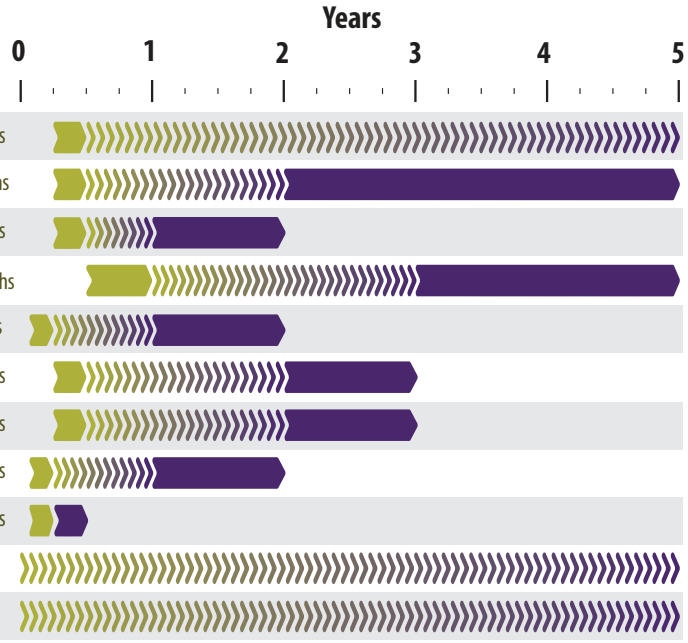
* Price quotes provided by www.pharmacy.ca. represent the price for 4 weeks' supply of a generic brand of medication where available (unless indicated otherwise). Prices include a usual and customary dispensing fee of $9.99 ($10.99 for Pace), which may vary from pharmacy to pharmacy. Accurate as of February 4th, 2015.
**estradiol valerate IM must be prepared by a compounding pharmacy, price quote provided by Pace Pharmacy

a) 50 mg OD given as 2x25 mg tablets OD;
b) 200 mg BID given as 2x100 mg tablets BID;
c) 25mg OD given as 1⁄2 x 50mg tablet OD;
d) 100mg OD given as 2x50 mg tablets OD;
e) The cost of 28 tablets of Premarin® 0.625 mg or 1.25 mg is the same
f) 4mg OD given as 2 x 2mg tablets
g) Estradot® brand
h) 0.2mg OD given as 2x100 mcg patches applied twice weekly(4 patches/week)
i) given as 1mL of 10mg/mL Estradiol valerate

EFFECTS AND EXPECTED TIME COURSE OF A REGIMEN CONSISTING OF AN ANTI-ANDROGEN AND ESTROGEN

The degree and rate of physical effects is dependent on the dose and route of administration[6], as well as client-specific factors such as age, genetics, body habitus and lifestyle.

Hormone treatment results in both reversible and irreversible feminization.



PHYSICAL EFFECTS	REVERSIBILITY	ONSET
Softening of skin/decreased oiliness	Reversible	3 - 6 months
Body fat redistribution	Reversible/Variable	3 - 6 months
Decreased muscle mass/strength[b]	Reversible	3 - 6 months
Thinned/slowed growth of body/facial hair[c]	Reversible	6 - 12 months
Male Pattern Baldness[d]	Reversible	1 - 3 months
Breast growth	Irreversible	3 - 6 months
Decreased testicular volume	Variable	3 - 6 months
Decreased libido	Variable	1 - 3 months
Decreased spontaneous erections	Variable	1 - 3 months
Decreased sperm production	Variable	variable
Erectile Dysfunction	Variable	variable

a) Estimates represent published and unpublished clinical observations
b) Significantly dependent on amount of exercise
c) Complete removal of male facial and body hair requires electrolysis, laser treatment, or both
d) No regrowth, loss stops

Expected Onset Expected Maximum Effect[a]

MONITORING STRATEGIES & DOSE ADJUSTMENTS

Standard monitoring of estrogen administration should be employed at baseline, 1, 3, 6, and 12 months. This should include a functional inquiry, targeted physical exam, bloodwork, and health promotion/ disease prevention counselling as indicated.

Testosterone level may be the most useful test for monitoring in trans women; for many clients, the goal will be to achieve the suppression of testosterone into the female range.

That said, the client may have clinically relevant results without total suppression of testosterone because of androgen blockade, which is not easily measured[7].

Estradiol levels are of variable utility in monitoring feminizing therapy given the wide cyclical variation in cis women. Most clients attain considerable feminization at estradiol levels between 200-500 pmol/L. According to the Endocrine Society Guidelines, serum estradiol levels should not exceed the mean daily level for cis women (approximately 700 pmol/L).

Clinical effects are the goal of therapy, not specific lab values

6. Feldman J, Safer J Hormone Therapy in Adults:Suggested Revisions to the Sixth Version of the Standards of Care , Intl J of Transgenderism 2009;11(3)146-182, DOI: 101080/15532730903383757

7. Tom Waddell Health Centre. Protocols for Hormonal Reassignment of Gender [Internet] San Francisco, CA 2013

HORMONE MONITORING SUMMARY FOR TRANS WOMEN

EXAM/ INVESTIGATION	BASELINE	MONTH 1	MONTH 3	MONTH 6
	Full Phyical Exam, measure: height, weight, waist & abdo circ., +/- breast, hips as per client preference, EKG if over 40, EKG + cardiac stress test if additional risk factors	BP, weight, waist & abdo circ., abdominal exam including liver palpation, extremity exam	BP, weight, waist & abdo circ., abdominal exam including liver palpation, extremity exam, measure breast and hips as per client preference	
BLOODWORK				
CBC	✓	✓	✓	✓
ALT/AST[a]	✓	✓	✓	✓
Creatinine/Lytes/Urea[b]	✓	✓	✓	
Fasting Glucose	✓			
LDL/HDL/TG	✓			
Testosterone (+/- Estradiol)	✓	✓	✓	✓
Prolactin[c]	✓	✓	✓	✓
LH[d]	✓	✓	✓	✓
Other	Hep A, B, C			

a) for Ontario providers who may be restricted in ordering OHIP- covered AST ,evels, ALT alone may be u.ed to screen for liver dysf.nction
b) Elevated LH post-gonadectomy may have implications regarding bone mineral density (See Osteoporosis and BMD Screening in Protocols)
c) Prolactin should be monitored at least yearly, and more frequently if elevation noted
d) Elevated LH post-gonadectomy may have implications regarding bone mineral density (See Osteoporosis and BMD Screening in Protocols)