Hormone Regimen Taken from:

http://www.transgendercare.com/medical/resources/tmf_program/tmf_program_regimens.asp

First, the basic methods:

One method involves giving primary importance to monitoring estrogen, so it is maintained at a level that is typically found in the genetic female. Measuring and maintaining the amount of estrogen in that range is the goal, and testosterone levels are not really considered. This method takes the notion of a slow but (arguably) sure approach.

The other method (which we prescribe) involves primarily focusing our attention on testosterone. While estrogens produce feminine attributes, their ability to reverse already established male attributes is poor. We found that the reduction of testosterone to a low normal female level was essential. We want to reduce testosterone's presence as much as possible through the use of higher doses of estrogen than the previous method. But estrogens alone are not sufficient to totally demasculinize. We found that anti-androgens were necessary to completely feminize/demasculize. And a powerful form of testosterone, dihydrotestosterone (DHT), maintains the masculine state-even in very small quantities. Only anti-androgens (e.g., finasteride) can significantly deal with testosterone and DHT, giving the final outcome of a fully female body.

Preoperative (Before Orchiectomy/Castration or SRS) Treatment

The following tables give a quick overview for typical drug regimens. The difference in the regimens is the use of estradiol gel or patch as part of the regimen, or excluding transdermal application altogether. Detailed descriptions follow.

PRE-OPERATIVE REGIMEN w/GEL	**MEDICATIONS**
• Estradiol : 2 mg to 4 mg (sublingual) daily.	
• Estradiol Gel : Apply 2 to 3 measures daily to the skin.	
• Finasteride : 6 mg Propecia (divided, morning and evening) or 5mg Proscar in the morning.	
• Spironolactone : 100 mg to 200 mg divided dose, morning and evening.	
• Progestin : 5 mg to 10 mg daily for 10 days of the month (optional).	
MOUSE OVER AN ITEM, ABOVE, TO VIEW DETAILS	

PRE-OPERATIVE REGIMEN w/PATCH	**MEDICATIONS**
• Estradiol : 2 mg to 4 mg (sublingual) daily.	
• Estradiol Patch : Apply 2 patches weekly to the skin.	
• Finasteride : 6 mg Propecia (divided, morning and evening) or 5 mg Proscar in the morning.	
• Spironolactone : 100 mg to 200 mg divided dose, morning and evening.	
• Progestin : 5 mg to 10 mg daily for 10 days of the month (optional).	
MOUSE OVER AN ITEM, ABOVE, TO VIEW DETAILS	

PRE-OPERATIVE REGIMEN w/o TRANSDERMAL	MEDICATIONS
• Estradiol : 6 to 8 mg (sublingual) daily.	
• Finasteride : 6 mg Propecia (divided, morning and evening) or 5mg Proscar am	
• Spironolactone : 100 mg to 200 mg divided dose, morning and evening.	
• Progestin : 5 to 10 mg daily for 10 days of the month (optional).	
MOUSE OVER AN ITEM, ABOVE, TO VIEW DETAILS	

The following medications are part of the regimens tables. Specific dosing for estradiol is listed in the tables.

Estrogens

Estradiol tablet

Estradiol tablet (Etrace, Estrofem). Take sublingually (under the tongue) in the morning and in the evening. Taking the tablets sublingually (letting them dissolve under the tongue) will largely give the same advantages as patches, gels or injectable. (see section)

Estradiol Gel

If you do not wish to use estradiol patches, an option is estradiol gel applied daily to the skin. The gel is usually alcohol based and is absorbed through the skin. The medication imparted into the skin usually takes about 12 hours for absorption into the blood stream, which produces a similar continuous action like the patch. Gels have the advantage as the wearer is not burdened with wearing a patch and the potential irritation from the adhesive that holds the patch in place.

Gels roughly correspond to the daily doses found in the 50 mcg and 100 mcg patches. Estradiol gel is found in individual 1 gram sachets or multiple dose tubes (30 g to 80 g).

Estradiol transdermal patch

Estradiol transdermal patch 50 to 100 mcg (microgram) worn weekly. A 50 mcg patch is equivalent to 0.05 mg, and 100 mcg patch is equivalent to 0.1 mg. The milligram or microgram amount indicates the amount delivered each day.

Patches do not always have good contact with the skin, so the increase in surface area of contact (i.e., 2 patches) provides more consistent results. If you have problems with patches staying put, please see A Sticky Solution to Transdermal Adhesion Problems.

An increasingly popular alternative to the patch is estradiol gel.

Anti-Androgens

Finasteride

Finasteride* (Propecia, Proscar). One approach is 2-3 1mg tablets in the morning and 2-3 1mg tablets in the evening of finasteride. The 1mg finasteride tablets are branded as Propecia, but generics are available. The other method is taking the brand name drug,

Proscar which contains 5mg finasteride. The tablet is not scored, and it is hard and oddly shaped. But with some difficulty, it is possible to snap the tab to allow for a divided dose.

*Without finasteride, results are only minimally improved over an estrogen only program.

Spironolactone

Spironolactone (Aldactone) 200mg daily. Use a divided dose of 100 mg in the morning and 100 mg in the evening. Spironolactone is well tolerated for extended durations and has a long history of being used for an anti-androgen. We have encountered patients who have used it in dosing as high as 600mg daily, but we have not observed any significant benefit above the 200mg daily dose. It is a potassium-saving diuretic, so large doses will necessitate not only more trips to the bathroom, but more trips to the laboratory to monitor potassium levels.

Progestins

Medroxyprogesterone

Medroxyprogesterone 5 to 10 mg daily, 10 days of the month. Medroxyprogesterone is a progestin, that being an synthetic form of the naturally occurring progesterone. Taken cyclically in a relatively small dose, this progestin is considered by some to have the potential to promote breast development in individuals. Medroxyprogesterone is usually supplied in micronized tablet form, so it can be taken sublingually. Occasionally mild depression is seen in individuals taking progestins, so this drug should be discontinued if there are any adverse effects that cannot be readily attributed to other factors. ***An alternative is progesterone***, but it is not as readily available.

Advantages of Anti-Androgens

When anti-androgens are given, particularly finasteride (Proscar, Propecia) in combination with spironolactone (Aldactone), full feminization is obtained in two to three years for the great majority of individuals. And since we have had a chance to observe many individuals using a range of therapies, and over quite a few years, we have made a few observations along the way.

First, the more masculinized the individual is in the first place, the greater the likelihood of very noticeable feminizination occurring when anti-androgens are used. Scalp hair thickens, often to a great degree even in individuals with severe pattern baldness. Body hair has a greater potential to diminish to a female level. And the body progresses to a much more female shape.

We also see that individuals who do not show as many masculinized traits in the first place also benefit in subtle ways, especially as they age. It appears that individuals who do not take control of testosterone levels and take a incomplete or sporadic approach to their therapies may likely show more coarsening in features as they age.

Substitutions to the basic drug therapy

Deciding on a drug therapy is a matter of common sense. If you have no known factors that may cause one to consider a different approach, naturally, starting with the most effective,

the safest, and the most widely used (and most predictable) drugs make the most sense. For most transgender women, estradiol, finasteride and spironolactone produce very good results. Some may also benefit from a progestin being added.

Individual preferences play a large part in the choice, and so does availability. Here are some substitutions to our estradiol w/o Transdermal regimen.

Substitutions for Estradiol

Sublingual estradiol may be replaced with one of the following:

Estradiol valerate

Estradiol valerate (Progynova - estradiol valerate), 6 to 8 mg daily taken in divided doses. Estradiol valerate is a prodrug of estradiol, and can be considered to be easily substituted.

Ethinyl estradiol

Ethinyl estradiol (Estinyl), 100 mcg taken daily. Ethinyl estradiol is a modified, more potent form of estradiol which results in a longer action. Accordingly, a much smaller dose is used. Its long action contributes to increased risk, so ethinyl estradiol is not a first choice.

Conjugated estrogens

Conjugated estrogens (Premarin) 3.75 to 5 mg daily taken in divided doses. Conjugated estrogens are derived from the urine of pregnant mares, and numerous reports indicate the donor animals undergo cruel and punishing conditions. We have had, on occasion, patients report some degree of depression associated with conjugated estrogens.

Estradiol IM (intramuscular) injection

Estradiol valerate IM 20 to 40 mg every 10 days to 3 weeks. Estradiol is sometimes given by injection into the muscle. The injection site is typically the buttock, alternating with each injection. Usually estradiol valerate is used, but sometimes the physician may choose estradiol cypionate. The estradiol is suspended in an oil mixture. Typically the mixture is contained in a 5mL (milliliter) or 10mL multiple use vial with 20 mg or 40 mg of estradiol present in each milliliter.

A program for injection requires close physician guidance: Dosing is not as straightforward as other routes of administration, injection must be deep into the muscle (we typically use a 1-1/2 inch long needle), and good self-injection technique is not always a skill easy to master and can even be dangerous. With the availability of micronized estradiol, estradiol gel and estradiol patches, injections should not be considered before these other methods.

Substitution for Spironolactone

Cyproterone acetate

Another widely used anti-androgen is cyproterone acetate (Androcur), 50 mg to 100 mg taken daily. Because of increased risks from its use, cyproterone may not be the best first

choice. Cyproterone acetate (Androcur) is not available in the United States unless one purchases it from an overseas source. It is readily available pretty much every place else.

While Androcur is available in 50 mg tablets, sometimes Diane-35 is used when small doses are desired. Diane-35 is a contraceptive with anti-acne properties (due to the cyproterone contained), and is comprised of 2 mg of cyproterone acetate and 0.035 mg ethinyl estradiol. Diane-35 generics are available.

Route of Administration

Why not just swallow a pill and be done with it?

Often swallowing a pill is the best answer for taking medication. But with pre-SRS hormone therapy, it may be a better choice to follow non-oral methods (preferably, under the tongue or applied to the skin).

Medication taken orally (swallowed as compared to under the tongue) first enters into the digestive tract and then is processed by the liver. When taken under the tongue or through the skin, medication directly enters the blood stream. In the case of estradiol, the conversion into its less estrogenic metabolites is curtained, allowing the more potent estradiol to remain present to a greater degree. And this method produces less strain on the liver.

Serum Testosterone Level

How much testosterone is too much?

Ideally, total testosterone should be brought to a level below 40 ng/dl.

To better understand that number, we really need to make a few comparisons. A normal male will have a testosterone level up to about 30 at about nine years of age, up to 150 by thirteen years. And between the years of sixteen to nineteen, normal testosterone levels can be anywhere between 200 and 970, and a few years later as much as 1080.

By comparison, testosterone levels in the female will be well below 40 up until the age of eighteen and later in life will likely reach no more than 70. Quite a difference.

The other measure is free testosterone, which is often looked at as a percent of the total. Free testosterone is not always measured or that test may not be available. This percentage of free testosterone is very small and is what is considered bio-available. In other words, it is the amount of testosterone that is unbound and thereby able to produce the undesirable male characteristics.

Secondary Medical Therapies

Is the hormone regimen all that is needed?

Although our basic regimen gives rise to a very female body (see Section 6 for details) with substantial regrowth of hair on the scalp and reduction of body hair, some additional medical therapies are required.

These additional treatments are:

- Electrolysis/Laser for beard removal (see Electrolysis Guide)
- Treatment of scalp hair with 5% minoxidil, or for much better results, minoxidil 5% with tretinoin 0.025 % - 0.05% (Retin-A).
- Tretinoin (Retin-A) 0.1 mg skin cream (with vitamin E) to speed up skin resurfacing and diminish blotchiness, sun spots, etc.
- Waxing, or lasering if you can afford it, to remove body hair starting after you have been on the regimen approximately one year (See Temporary Methods for information on waxing).

Post-Operative Regimen

Unless one has been on a feminizing regimen similar to the program described here, with sufficient anti-androgens as well as estrogens for at least 3 years, one must continue their anti-androgens after surgery along with a reduced amount of estrogen. As stated previously, it takes approximately three years of estrogen/ anti-androgen use to achieve full feminization. We have helped and advised many transgender women and found that it matters little when the SRS is performed during this period as far as the final results are concerned. The final full feminization can be achieved if the SRS is performed one year into their regimen with two additional years following it, after three years, or even if the full three years of hormonal feminization is post-SRS.

POST-OPERATIVE REGIMEN	MEDICATIONS
• Estradiol : 2 mg (sublingual) in the morning.	
• Finasteride : 3 mg Propecia or 5mg Proscar in the morning.	
• Spironolactone : 100 mg to 200 mg divided dose, morning and evening.	
MOUSE OVER AN ITEM, ABOVE, TO VIEW DETAILS	

Orchiectomy/Castration

Unless one has a condition which strongly limits the use of estrogens, we caution against orchiectomy (castration) if one is thinking of SRS in the future.

The reasons for this are:

- Orchiectomy cannot produce additional feminization or speed the process of feminization any better than that achieved by the use of drug therapies alone. And one must take estrogen and anti-andgrogens after orchiectomy at any rate.
- We have been advised by several SRS surgeons that unless the orchiectomy is performed by a skilled surgeon the scrotum (which is often used to give depth to the neo-vagina) may be too small and scarred for use.

If you do decide to go the route of castration with or without future SRS, realize this procedure is major surgery. There are physicians who are willing to perform castration under less than optimum conditions in an office environment, but this likely may not be the best choice.

If one has already had O/C, their regimen is the same as that of a post-op.

Laboratory Testing

The use of laboratory testing prior to treatment and at intervals during treatment is recommended. Laboratory testing requires physician oversight. The following battery of tests is considered useful, and may be used for your physician's reference. You will note the absence of serum estradiol, as its measurement offers a poor gauge in determining the effectiveness of treatment.

LABORATORY TESTING
• CBC with Differential • Comprehensive Metabolic Panel • Lipid Profile • Testosterone -Total + Free • PT/PTT • Urinalysis