The Straight Dope On Hormones

by Delia Van Maris, M.D.,
edited by JoAnn Roberts, Ph.D.

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This monograph is edited from the CDS video The Straight Dope on Hormones. *None of the charts from the video are included. The video is available from CDS.*

Introduction

I'm going to talk about hormonal therapy and, specifically, what effects it is going to have on males taking female hormones or estrogens. I've divided this up into a series of elements like the fingers of your hand.

Hopefully this monograph will increase your knowledge base so that if you're about to make any decisions on hormones or if you're interested in more information, you can go from here.

Is there a heavy price to pay? Is it too heavy a price to pay? And what can you expect? I'll provide you with a model for hormonal therapy that may be controversial, but it will work.

I should point out that I've given a similar talk to a totally female audience—real females—and discussed estrogen replacement therapies (ERT). Both sexes are using hormonal therapeutic strategies for totally different purposes.

I can also say I've given this talk a number of times and I've had a very interesting set of experiences. On one occassion, I gave this talk and there was a man and his wife, at the very same talk, at the very same time. The husbands' perception was that I had given him permission to take hormones and that I indicated it was a very safe thing to do. His wife, sitting two seats away, perceived that these were horrible drugs, that they would cause all kinds of health problems, and that he should not use them.

I am comfortable with the fact that people come with their own ideas, their own expectations—and some of what I say will be col-

ored by my own opinions—but I'm hoping to give you a skeleton of basic information. Knowledge is power and it should empower you to make further informed decisions.

Why am I interested in this? Well, obviously because of my cross-dressing, but I am also interested professionally. In my past I was part of a clinic that evaluated and treated transsexuals (both male and female) in transition. I am no longer associated with this or any other program, which is why I think I have an even better perspective, because I am no longer the health care provider for such patients and because I do not personally use exogenous hormones, i.e., hormones that are not produced inside my own body.

We want to know then:

1. What Is A Hormone?
2. How Do Hormones Fit Into The Biological System?
3. Where Do Hormones Work In The Body?
4. What Happens to Hormones In The Body?
5. What Are The Sex Differentiation Effects of Hormones?
6. What Are the Effects On An Adult Body?
7. What Effects (Side Effects) Can Be Reasonably Expected?

What Is A Hormone?

To know what a hormone is, you have to know what it's supposed to do. A hormone is an organic compound that has a target somewhere in the body. A gland is the factory—the production site—where the hormone is made.

The target, wherever the tissue is, has to have a receptor for the hormone. This concept of a specific receptor is important because the combination therapy I propose depends on effector (i.e., the hormone) and receptor interaction.

So, let's start with this definition. *Hormone*: a chemical substance, present in very low concentrations in the blood, that has a regulatory

effect on the metabolism of at least one specific organ or tissue and at a site different from the site of secretion. Hormones can alter the metabolism of cells or the synthesis/secretion or other substances (tropic hormones). And, we'll add that sex hormones come in two "flavors:" androgens (male hormones) and estrogens (females hormones).

[Actually, there are no such things as male and female hormones since both males and females make both androgens and estrogens. What makes the difference are the amounts generated and where they are made.]

Think of insulin. It comes from your pancreas, but it has effects throughout the body, not just your blood sugar, but in the cells that use that sugar. The important thing is that the hormone goes somewhere , other than where it's produced to have its effect. That "somewhere" can be neighboring tissue.

With the sex hormones, we didn't know how they worked until recently. We didn't know what turned them on. There's new information that shows how they come about and where they go. They have a regulatory effect, they "turn-on" a cell(s) to do something. One of the side effects is that hormones can find targets and do things you don't expect or want to happen.

Hormones are secreted from Glands. So, what is a gland? It is a group of cells specialized to secrete hormones into the blood. Some glandular cells can secrete multiple hormones. So, a gland secretes a hormone that finds a target and sets a process in motion. Then something has to shut down or regulate that process. The target cells have to be reset so the process can start over. This is an important issue in terms of combination therapy. A hormone gland can be very discrete. It can be large tissue like the liver and pancreas, or small tissue like the thyroid and parathyroid, or it can be a set of microscopic cells.

A hormone needs to find a target, or receptor. What is a receptor? A receptor is a protein on the surface of a tissue cell that specifically binds a hormone and produces a biological effect after such binding. A receptor is like a lock and the hormone is the key that (1) fits in the

lock, (2) opens the lock, *and* (3) results in another effect, like opening a door. This lock and key analogy will be very useful later in the discussion. I'll keep referring to it.

Certain things have to happen to moderate these cellular events - the hormone (the key) has to find the receptor (the lock). The key has to turn in the lock, i.e. the binding process. Only then will the biological action occur. A key occupying a lock that will not open the lock makes that lock (receptor) unavailable (blocked).

In terms of female hormones, the breast has lots of receptor sites and they are very functional. So, when a male takes female hormones, or a women goes through puberty, the breasts respond to the estrogens because that is where the receptor sites are.

How Do Hormones Fit Into The Biological System?

I'm going to introduce the term "cybernetics." Even though most people think of computer systems when they hear "cybernetics," it is really a term originally used to describe feedback mechanisms in biological systems. Feedback occurs either positively, reinforcing or amplifying the action, or negatively, decreasing or damping the action. In either case, the purpose of feedback is to reach a steady state, one in which the biological system is in balance. When we introduce a hormone into the body from outside, the body's system becomes unbalanced. The cybernetic mechanisms of the body take over to regulate the generation of the hormone and its effects, so that the body can return to its steady state of balance.

So, for example, young males who take very high doses of anabolic steroids, which are very similar to testosterone, get big and bulky, which is what they want. But, then several other things begin to happen. They find their testicles shrink with these big doses of steroids. What is happening? The body "knows" it is supposed to have just so much testosterone circulating in its systems. When these large doses of testosterone-like compounds hit the body, cybernetics takes over

and begins shutting down the natural sources of testosterone, such as the testes. Unused, they shrivel. This is a negative feedback system that says, "Wait a minute! There's way too much testosterone here."

We now know that hormones can affect the brain and psychological moods, often before they affect anything else. The guys in the gym talk about "roid rage," because these steroids saturate sites in the brain that aren't supposed to be exposed to such large doses of hormones.

Another side-effect of very high doses of male hormones in a male is called "bitch tits." The guys on huge doses of steroids get big pectoral muscles and then they get little "buds" under their nipples. What's happening here is that there is so much male hormone the body starts converting some of it to estrogen-like compounds. The next thing you know, here are these little "breasts" sitting on top of these huge muscles. Sometimes they have to be removed surgically.

The body is trying to get back to a steady state. It's trying to reestablish, through cybernetics, a balance we've disrupted with exogenous (outside) hormones. Let me give you a few more examples of cybernetics and feedback.

In almost all biological systems, the feedback is negative, that is a dampening of response. Positive feedback is inherently unstable. A common example of positive feedback is the squeal that comes out of a speaker if you get too close to it with a microphone connected to the the amplifying system. The background noise coming from the speakers is picked up by the microphone and amplified at the speakers, which is picked up by the microphone and amplified again, and so on, until the whole system becomes unstable and that squeal is the system oscillating, trying to find a balance. One of the few biological systems that depends on positive feedback is the process of ovulation in a female.

A common example of negative feedback is the thermostat in your home. You want the house to be a certain temperature and the thermostat applies power to the heater that heats the house. When the

temperature hits the right point, the thermostat turns off the power. The house slowly cools down until the thermostat puts the power back on to warm it up again. The human body works the same way. For example, a gland secretes a hormone that stimulates the thyroid (thyroid stimulating hormone, TSH). The thyroid produces another hormone, thyroxine, which tells the gland secreting TSH to stop making TSH. Once the level of thyroxine goes down, the gland may start secreting TSH again. This is negative feedback at work.

It is important to know that there are two similar cybernetic systems operating within the body, hormonal and neuronal. They are different but work in similar fashion. Generally, the neural system has a quick response cycle. Think of the fight-or-flight response to a threat. If you get scared, your body reacts quickly to the threat and calms down fairly quickly once the threat is gone. Generally, the hormonal system has a slow response cycle. It takes time for the hormones to travel from origin to target and effect a response.

In fact, many hormones and neurotransmitters share similar chemical backbones, and cross-over can occur between the two systems. That is, the hormonal system can interact with the neural systems and vice-versa. I mentioned males taking high doses of testosterone-like androgens to build muscle mass. One of the severe side-effects of high doses of androgens in males is a psychotic level of aggression and violence. In these cases, the androgens are crossing-over to the neuronal system causing irrational behaviors. By the way, this can happen to women as well, if they're taking testosterone-like steroids.

The same thing, in reverse, can happen to a male taking estrogens. They often report that they feel more placid or peaceful. In some cases, they can become very emotional and overly sensitive, crying at almost any instant. Again, the hormonal system is crossing over into the neuronal system and causing a response.

When developing a model for hormonal therapy we need to keep this cross-over effect in mind.

Where Do Hormones Work In The Body?

To understand where hormones do their work, we have to go back to the neuronal system first. Muscle is a good example. If you want to run, your body must release little packets of chemicals to trigger your muscles to contract and expand. It's a local effect and very rapid. We're talking response times in fractions of seconds. Hormones, on the other hand, work in terms of seconds, hours, even months. Neurotransmitters have very specific target sites. So do hormones, but hormones can do lots of different things to lots of different tissues. Generally, hormones have multiple targets and that's another reason why we can get undesirable side-effects from hormone therapy. For example, beside their chief target site, almost all hormones do something to your brain. That is, they interact with the neuronal system. But, they also interact with your gut, skin, hair, liver, even affect your immune system.

Let's go back to the lock and key analogy. Suppose I have 10 different locks with 10 keys and throw all the keys in a pile; you know there is only one key that opens one specific lock. Some keys won't even fit into that specific lock. Some keys will fit the lock, but they won't open it. Only one key will both fit the lock and open it. That's an important concept to remember.

So, here we have a receptor (lock) and a hormone (key). Along comes the key in the blood stream and it fits into the lock and turns, opening the lock (activating the cell) and some biological function results. Now, it turns out we have locks for which we have no keys. Another way of saying that is there are receptor sites in our body for which we normally do not make a hormone, or we make so little as to be of no consequence. For example, there are receptor sites in the male breast that will respond to estrogens, but normally we make so little estrogen that the sites never respond. On the other hand, males have lots of receptors for testosterone and other androgens. The response is body hair, increased muscle mass, lean body mass, and a

whole host of one-time changes triggered at puberty.

Say I want to suppress these androgenic effects like body hair and lean body mass. If I flood the system with estrogens, I can stimulate a totally different set of responses from those same cells and try to cause loss of body hair, redistribution of body fat, and growth of breast tissue. However, because the other locks (receptors) and keys (androgens) are still present, there can be a "war" going on inside the body causing serious side-effects.

It makes some sense then, if we're going after a specific effect, to take into account both types of receptors. Depending on the degree of effect desired, we can block the androgen receptor sites without introducing external hormones and achieve some feminizing effect simply because the androgens can't do what they're supposed to do. This is a technique often used in medicine.

Go back to the lock and key analogy. We can make a new key that fits the lock but won't open it. That makes the lock unavailable for the real key. It's like filling the lock with gum or wax. Our new key blocks the receptor site. And just like the hormones themselves, these blockers cause effects at other than just the one target site. This interaction is important.

Blockers are nothing new. Some of you may be aware of blocking drugs, like beta-blockers used to control high blood pressure. These drugs block "beta" sites which lower your heart rate and your blood pressure. But these drugs also have side effects; some can cause impotence because they also block testosterone sensitive sites. Drugs that block these testosterone sites are called androgenic blockers and they have an important use in medicine.

Androgenic blockers were developed to control prostate cancer. Prostate cancer in males is aggravated by androgens. The androgenic hormones stimulate the cancer cells and they proliferate rapidly. Early treatment for prostate cancer included castration (orchidectomy) to remove the source of androgens, and the administration of estrogen

to suppress the production of androgens. Obviously, both these treatments had serious and often unwanted side-effects. But, recent advances in pharmacology allow us to block the androgen receptor site in the cancerous prostate cells and thus suppress the spread of the cancer with less serious or even minimal side-effects. Unfortunately, the most effective of these drugs are only available now in Europe and are just making their way to the U.S. in clinical trials.

Many times people who are having blocker therapy for prostate cancer will get some physical changes suggestive of the secondary sex characteristics of a female, which *we* might think is wonderful, but most of them aren't so happy. The package insert for one of these androgenic blockers said 11% of males who took this drug "complained" of breast development. In a study in which I was involved, over half the males had some breast development, but only 10% *complained*. For some men, cancer is preferable to breast development; for others it's a small price to pay for survival.

So, a lot of things can be done to modify the hormonal system. It's not limited just to taking estrogens. You can block the sites (gum the locks), send wrong messages, or fix the cell so it doesn't respond.

Another thing to remember is that no two people are alike, so no two people will respond to these drugs in exactly the same way. One person will take estrogens and get a phenomenal effect in terms of hair growth reduction and breast development. Another person on the same dose may see nothing. Yet a third person may get nothing but unwanted side-effects. Sometimes these drugs work in reverse. Where you think you'll see a reduction in body hair, you might actually see an increase in growth. These cumulative side-effects of estrogenic therapy in males haven't really been studied.

What Happens to Hormones In The Body?

We talked about hormones and where they come from. They go to a target site, then something shuts them down and they have to be

eliminated. This is usually caused by metabolism of the drug. One of the problems with any drug is that after its been metabolized, you may still have an active drug but in a different form and with a different target site. So it may not be in its original form in your body, but in many cases the metabolite has a greater effect or a tremendous side effect. This is a problem with over-dosing for all kinds of drug therapy.

So what does that mean for estrogenic and anti-androgenic therapy? Well, if you look at the structure of these hormones and some of the related neuro-transmitters, you begin to notice a similarity. That similarity becomes more clear when you draw the structures in a special way that scientists use to represent these compounds. You notice that the core structure of almost all these compounds is the same. Think of this core as the stem of the key and all the chemical additions around the core are the teeth on the key. By changing the teeth, you can make the key fit a different lock.

Now, if I take estradiol, one of the baseline estrogens, and I do nothing more than change two of the teeth from –OH (hydroxyl) groups to =O (keto) groups, I get the baseline androgen called androstenedione. In other words, I can change an estrogen into an androgen and vice-versa. These changes can be performed in a laboratory or in the body. If they occur in the body, the transformation is helped along by enzymes that facilitate the conversion. One of the metabolites of testosterone is dihydrotestosterone which is very similar to estradiol. Dihydrotestosterone is very active and is responsible for the proper development of secondary sex characteristics in males. Dihydrotestosterone can be converted to estradiol and vice-versa.

Now I can play with the teeth of the key in all kinds of ways. I can make pass keys. I can make something that will open lots of doors and cause lots of different effects. I can make a better key that specifically opens some doors, but not others. I can make those kinds of keys that fit in the lock and don't turn, in which case it is a blocking mechanism.

One set of these keys is very interesting. Change one of the teeth and we get an aldehyde. That will make aldosterone which is important for two reasons: (1) it comes from the adrenal glands on the kidneys, and (2) it is itself a compound that converts into androgens. Sometimes, we'll see a woman come in with excessive hair growth. We know that androgens stimulate hair growth. So where are the androgens coming from in a female? Her adrenal glands are suspect. These women are often found to have hyperactive adrenals and these stimulate production of aldosterone, which can, in turn, create androgens, which in turn stimulates the hair growth. We can treat this condition with a drug called Spironolactone. Spironolactone is a diuretic and a blocker. It blocks aldosterone production in the adrenals. Block the androgen, stop the hair growth.

Forty years ago, when they first studied this drug, they found that it can cause gynecomastia (breast enlargement) in males. Why? Because the drug is blocking androgens produced by the adrenal glands and often, especially in older men, the adrenals are a major source of androgens in the male. Block these sources and you begin to see feminization effects like breast enlargement and changes in peripheral skin. While these are considered "side-effects" in normal males, for a transgendered male these may be desirable effects. In fact, Spironolactone is often prescribed as a first step in "hormone" therapy because it is thought to be relatively safe and its effects are reversible.

Sometimes it is combined with small doses of estrogens to stimulate breast development when estrogen alone doesn't seem to do anything. Here is the lock & key/blocking effect at work. Even though there is estrogen available to stimulate the sites in the breast tissue, there are still enough androgens circulating to suppress growth. The Spironolactone blocks the adrenal androgens and allows the breast tissue to respond.

What Are The Sex Differentiation Effects of Hormones?

What is the result of the generation of this hormonal pool? First of all the production of these substances occurs very early in the embryo. They are responsible for why some people are male and some are female. In the developing embryo, there are two parallel sets of tissues that can develop into female genitalia and ovaries, or into male genitalia and testes.

If androgens are produced, the tissues for the female structures will disappear and the embryo will develop as a male. If estrogens are produced, the tissues for the male structures will disappear and the embryo will develop as a female.

Science now knows that the production of androgens or estrogens is controlled by genes on the chromosomes. For production of androgens, and therefore a male, there must be an SRY gene on a Y chromosome. For production of estrogens, and therefore a female, there must be two DSS genes, one each on each X chromosome. If anything goes wrong at this stage, the embryo can develop with ambiguous sex organs. There are people today with the "wrong" chromosomes for their apparent sex. For example, it is possible to have a person with XY chromosomes who would normally be a male and that person is very obviously a female. Something about the SRY gene on their Y chromosome hasn't worked properly or they have a double DSS gene on their X chromosome.

The most common case of a defective SRY gene results in what is called testicular feminization or testosterone intolerance. The person has XY chromosomes but their body, for reasons unknown, does not respond to the presence of testosterone. None of the keys open any of the locks. These people are born with feminized external genitals or ambiguous genitals and are usually raised as if they were females. In fact, their families may honestly believe them to be females. As these people reach puberty, the small amounts of testosterone produced by their bodies is metabolized into estrogenic compounds and they be-

gin to develop breasts because their androgen receptors are blocked but the estrogen receptors aren't. The end result is a body that, for all purposes, looks female, at least externally.

Unfortunately, all is not well. When these pseudo-females fail to menstruate they naturally go to the doctor and what is discovered are small testes in the abdomen, but no ovaries. The testes must be removed because they can become malignant. Imagine having to tell someone who believes herself to be a normal woman, "Oh, by the way, you're really a male and that's why you can't have children."

There is another example of delayed development of the male called "guevodoces" which literally means "penis at twelve." This syndrome is almost exclusively a trait of a remote South American tribe of indians that have inbred. The syndrome is a result of an enzyme deficiency that prevents conversion of testosterone into dihydrotestosterone, which is necessary for the proper development of the genitals. Some of these males are born with feminized genitals and are raised as girls. But, as they reach puberty, their bodies begin making so much testosterone that some of it is converted to the dihydro form and, in short order, they begin to develop a normal penis and scrotum.

In another case, the person may have XX chromosomes and would normally be a female, but they are obviously male. In this case, perhaps they have a portion of an SRY gene present.

These examples show the importance of a hormone, what it does, where it goes, the keys, the locks, the receptors and the number of doors it is going to open. One thing is for certain, the addition of androgens to the embryonic system has a profound effect on the person. And later in life, a male going through puberty experiences additional irreversible effects due to androgens. These effects are what make estrogen therapy for a male such a difficult task. Once the tissues in the body have differentiated under the effects of the androgens, it is virtually impossible to reverse the process. We can only, at best, minimize the effects.

What Are the Effects On An Adult Body?

About half of the people I've been involved with in terms of hormone therapy were Female-to-Male (F-t-M) transsexuals. In my opinion, F-t-Ms have a good transition during hormonal therapy. They experience all the changes that normal males experience during puberty; the voice gets deeper due to thickening of the vocal folds; beard growth starts; and body hair growth increases. They get good muscle development as well. They may also experience acne and male pattern baldness as a result of the androgens they take. These changes are irreversible. Hormonal therapy is a major step for a F-t-M transsexual. Why? Because the addition of androgens to their system excites all the androgen receptors that are already there but dormant. In effect, they go through puberty all over again, but this time their body is differentiating as a male's would.

Male-to-Female (M-t-F) transsexuals, on the other hand, have a difficult time with hormone therapy because their bodies are already differentiated by the natural presence of androgens. Adding estrogens in an attempt to feminize the male body doesn't always achieve the desired results and some things are immune to change once the male has gone through puberty. For example, estrogens will not alter a male's voice; they will not cause significant changes in bone structure; facial hair will not stop growing; and they will not restore hair on the head. Most of the fundamental differentiation experienced by males during puberty is irreversible. Therefore, a M-t-F transsexual is probably going to need electrolysis to remove the beard, and scalp reconstruction or hair transplants to replace lost hair. A large Adam's Apple can be minimized by a procedure called a tracheal shave, but it is not without risk. There is also vocal fold surgery to raise the pitch of the voice, but from personal experience the results are wholly unpredictable and not recommended except in extreme cases.

Remember, there are different ways to approach this issue of hormones. First, add estrogens to the system. Second, block the androgen receptors. Now, third, we can block the production of androgens. How does that work? The pituitary gland makes a host of compounds that regulate other glands and their hormonal output. Some are in such small quantity that we can only recently detect them. There are two, FSH and LH, that were considered only female hormones, so they have names relating them to females. FSH is Follicle (egg) Stimulating Hormone and LH is Luetinizing Hormone. Both play a critical role in ovulation. But, it turns out, men make both these hormones as well and they function in the regulation of testosterone, as well as the development and secretion of sperm.

However, they function in a very specific way. The signal sent out is pulsed and it usually happens during sleep. This is probably why teenaged boys sleep so much; it is a physiological requirement during puberty. This pulsing during sleep is also responsible for the mild erection that some males experience on waking. During waking hours, though, these signals fall to almost zero. The interesting thing is that if you introduce these chemical signals at a very low but steady level, they will shut down the gonads.

Similarly, there is a drug used for patients with prostate cancer. One injection into a muscle and it dribbles into the bloodstream. At the end of thirty days, no more testosterone.

What Effects (Side Effects) Can Be Reasonably Expected?

Based on what I've said and if you just took estrogens, it must be a sustained effort for a good effect, because that's the way hormones work. We're talking about years of continued therapy. Most people are willing to do that, but most don't understand that it takes that long. For example, for maximal breast growth it takes about two years. But everybody is different. Some people get more development than others, and even those with reasonable breast growth may not be satisfied because the chest and shoulders are big in comparison to a genetic female. Breast development is genetically determined, even in

males. A look at the females in a family will give a good indication of what kind of breast development a M-t-F might expect. If the women in the family are small breasted, so will the M-t-F transsexual.

There will be suppression of testosterone and that will diminish libido (sexual arousal) and diminish erections. After a time, the effect is the same as if the male had been castrated. How long that takes depends on the dose level and the exact drug. Testosterone also works to build muscle tissue, so a suppression of testosterone will cause some loss of muscle mass and that means loss of body strength. This is most noticeable in the upper body of M-T-F transsexuals

Other effects include a softening of body contours, fat redistribution to below the waist, decrease in bodily hair growth, a slowing of facial hair growth, and stabilization of a receding hairline.

However, the first noticeable changes will be affective responses. Remember, the drugs act on the neurological system as well as the hormonal system. That means the brain is affected and usually more rapidly than any other organ in the body. There is evidence that hormones change the way people "feel" about things, the way they "see" things and the way they respond to the world. There are disturbing references in the medical literature to M-t-F transsexuals on long-term hormone therapy who commit suicide and there is no suitable explanation why. It may be a form of depression. A M-t-F pre-operative transsexual has a mental image of what they'd like to look like. They see "show-girl" transsexuals on the television talk shows who started on hormones when they were 18. There is just no way they can expect the same final result. Once that realization sets in, so can depression. If the person cannot overcome that unrealistic mental image, they just might contemplate suicide as a final solution. This reinforces the need for counseling not only before, but during and long after transition.

Some of the possible side effects are phlebitis (blood clots in the legs), and pulmonary embolism (blood clots in the lung). You can die

suddenly from the latter. Water retention is also an effect which can raise blood pressure to dangerous levels. Forming a prodigious amounts of body fat in a short period of time can also tax the heart. These effects are related to dose levels. Take higher doses to get an accelerated effect and you have a higher risk of experiencing an adverse side-effect. That's why I advocate a multi-faceted approach to ablate or negate the androgenic effects while enhancing the estrogenic effects from as small a dose of estrogens as possible. There is good evidence from the literature on prostate treatment that smaller doses can be just as effective with less side effects.

A Treatment Regimen

My basis for therapy involves working with both the locks and the keys, the hormones and the receptor sites. We're going to gum up the locks and block the keys for androgens, which will enhance the effects of smaller doses of estrogens.

Part 1 - Block Receptor Sites

The following drugs are the most effective receptor blockers presently available, i.e. they gum up the locks: Cyproterone acetate/RU 23908 — Androcur, Flutamide — Eulexin

These drugs form the basis for the hormone therapy, block the receptors for androgens, while not interfering with the androgens themselves.

Part 2 – Block Androgen Production

In the past, the only way to effectively block the production of androgens in the male, primarily testosterone, was castration. This was, for many years, a preferred treatment for prostate cancer patients. But castration is not without its own post-surgical problems and if you are not a transsexual, castration may be out of the question. We have these chemical alternatives, although not well studied for transsexual therapy: Leutinizing Hormone Releasing Hormone (LHRH) — Luprolide and ICI 118630 — Zolade

Luprolide is injected either monthly with a timed release, or more frequently in a different formulation. These drugs effectively suppress the production of androgens, further enhancing the estrogenic effects of other hormones. The goal is to administer the smallest amount of estrogen necessary to achieve the desired effect and minimize side-effects. Which leads us to...

Part 3 – Estrogens

This part of the therapy is well developed and there are lots of agents from which to choose. Premarin is most often used, but it isn't totally effective and there are other alternatives.

Conjugated estrogens — Premarin, 17 alpha-Estradiol,
Ethenyl Estradiol — Estovis

The Cost

The chief problem, so far, with this approach is cost. The breakdown looks like this on a monthly basis (as of 1994):

Androgenic Blockers	$200
Anti-Androgens	$500
Estrogens	$90
Other	$40
TOTAL	$830

Some of these drugs are not available here is the U.S. yet, People are going to Canada and Mexico to get them and bring them back to the U.S. Fortunately, these drugs have primary uses not related to gender-role transitions and that's good because it means as their use becomes more widespread, prices will decline and other drugs will be developed with similar properties

A Word of Caution

Remember my statement that when a hormone is released it affects many targets and many different tissues. This is why hormone therapy

needs to be done under medical supervision. I can't emphasize that enough. Few people taking these drugs pay attention to anything but maybe a bi-annual physical. If you're going to start messing with your endocrinologic steady-state and your biologic system, you need regular and periodic examination.

Before beginning any hormone therapy treatment, you should have a series of tests to get baseline data on yourself so that if a problem begins to show itself, there is a basis for comparison. Reasonable data points are as follows: EKG, Liver function, Renal function, Thyroid function, Pituitary function, serum testosterone levels. Then, once therapy begins, you should have a blood series done at least every three months for the first year or so. Remember that hormones are long-term acting agents, so monitoring over a two-year period is not unreasonable. After that, it's up to you and your physician as to how often you should be checked.

Another area that is becoming somewhat of a concern for M-t-F transsexuals is monitoring for breast cancer. Breast cancer in males not on hormones is rare but not unknown. Adding estrogenic agents to your system may actually trigger breast cancer cells into activity. For this reason, anyone on estrogens needs to do periodic breast examinations and I advise regular mammograms. If you want breast development, you better be willing to accept the responsibilities and consequences.

Conclusion

So far, everything we've talked about is largely reversible. The advantages are that a relatively safe hormone therapy can be devised to enhance desirable secondary feminine sex characteristics like breast tissue development. The disadvantages are unwanted, unknown side-effects and high cost. There aren't enough clinical studies on this community taking these drugs.

But, if you understand the elements of the plan — what are hormones, what do they do, what changes are reasonable to expect, what are the potential side-effects, and what is an effective regimen — then you have the information you need to make an informed choice. Knowledge is power. Power carries responsibility. The power to choose is an awesome responsibility.

NOTES

A Few Of The Other Books by CDS

The Transsexual's Survival Guide to Transition & Beyond, by JoAnn Altman Stringer (ISBN: 1-880715-04-X) Ms. Stringer, a post-op transsexual, covers everything the therapist didn't tell you and then some. 68 pages. $15.

The Transsexual's Survival Guide II, for Friends, Family & Employers, by JoAnn Altman Stringer (ISBN: 1-880715-90-0) Ms. Stringer explains the transition process clearly for family, friends and employers. 60 pages. $10

Identity Management in Transsexualism, by Dallas Denny, M.A., (ISBN: 1-880715-07-4) Ms. Denny covers the legal changes that transsexuals must conclude to change their public identity. Topics include name change, resumé, past references, estate planning, and more. 80 pages. $15

The Straight Dope on Hormones Video, by Delia Van Maris, M.D., (VCD1) The video from which this book was developed. Includes all the slides and a brief Q&A. 55 min. VHS. $40.

Cosmetic Surgery Options, by Delia Van Maris, M.D., (VCD2) If you've ever considered cosmetic surgery, you'll find a wealth of meaningful information on this tape. 48 min. VHS $40.

When ordering, please add 10% of the order total (up to a maximum of $10) for shipping and handling. Send you order to: Creative Design Services, PO Box 61263, King of Prussia, PA 19406, or call 610-640-9449 for VISA or MasterCard orders.

e-mail address: *cdspub@omni.voicenet.com*

The Straight Dope On Hormones

If you are thinking about taking hormones, or if you are already taking hormones, you need this book. Speaking with insights gained from professional experience dealing with transsexuals and administering hormones to both males and females, Dr. Van Maris explains:

What Is A Hormone?
How Do Hormones Fit Into The Biological System?
Where Do Hormones Work In The Body?
What Happens to Hormones In The Body?
What Are The Sex Differentiation Effects of Hormones?
What Are the Effects On An Adult Body?
What Effects (Side Effects) Can Be Reasonably Expected?
A Treatment Regimen

About the Author: Delia Van Maris, M.D., is a physician and a member of the transgender community. Dr. Van Maris serves on the board of directors of the American Educational Gender Information Service (AEGIS) and is a frequent speaker on the subject of hormones and hormone therapy in the transgender community.

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