

Disclaimer: This information is not meant to diagnose or treat any individual's specific condition. Please do not make any changes to your medical treatment program without first consulting your primary care physician.

Hormone Balancing For Immune Support

The word hormone is derived from the Greek word “to excite”. Though hormones are released in very small amounts, they can have both wide-ranging and powerful effects. They influence sex drive, energy level, immune function, mood, metabolic rate, sleep, and appetite. Within ten years, I predict the use of natural hormone replacement therapy in men and women will play a very important role in standard medical practice. (This does not include the practice of giving estrogen collected from the urine of female horses to women in menopause, the way the most frequently prescribed brand of estrogen, known as Premarin, is produced.)

Endocrine glands secrete hormones in response to stimulatory signals from the brain. The pituitary/hypothalamus region of the brain monitors the blood and decides when to stimulate hormone secretion by individual glands such as the testes (testosterone), the adrenal glands (DHEA, cortisol, epinephrine), the pancreas (insulin), the ovaries (estrone, estrace, and estradiol), and the thyroid (thyroid hormone). If the brain is under a great deal of stress, the regulation of your endocrine gland's hormone output by the brain can become disrupted.

The endocrine system affects the immune system both directly and indirectly. Hormones such as DHEA (dehydroepiandrosterone) and thymic factors have been shown to directly mediate immune system functioning by

stimulating lymphocytes and other white blood cells. In contrast, testosterone's influence on mood, libido, and muscle mass has an indirect but significant effect on the immune system's functioning.

Many patients with chronic medical conditions, including HIV, Cancer, and Chronic Fatigue, experience a gradual decline in their quality of life which can extend over many years. Many of the symptoms associated with this decline are significantly influenced by hormones.

Important Note: When measuring serum hormone levels, the “normal range”, as defined by the testing laboratory, is the average level found in the general population. This range is very large and includes people who feel sick and tired all the time, as well as those who are healthy and feel great. In my experience, the normal range for people with chronic medical conditions should be the hormone levels found in a 25 to 35 year old adult at their peak of health. This is what I define as the “optimal hormonal range for healing”.

Hormones and Body Cell Mass

As described in detail in my book “Healing HIV”, maintaining your body cell mass (muscle tissue) at 100% of ideal levels, can help to optimize the functioning of your immune system. Maintaining your testosterone level within the “optimal range” (in both men and women) can help ensure that these body composition goals are met.

Some physicians never test their patient's testosterone level. Others give all of their patients regular testosterone injections whether they need them or not. As always, the key to maintaining good health is finding the right balance for each individual patient's situation.

Hormones that build body cell mass are classified as steroids. This term refers to the physical structure of the molecule and not its function. Steroid hormones are essential to good health and exert a multitude of positive effects on the body. Estrogens soften the skin and stimulate the growth of the breasts. Androgens, such as testosterone, have masculinizing effects that promote hair growth, enlargement of the genitalia, and a deepening of the voice. Steroid hormones *that increase muscle mass* are termed *anabolic* steroids. Natural anabolic steroids, produced by both men and women for this purpose, include testosterone and DHEA.

Many of my patients (both men and women) have benefited tremendously by supplementing with natural testosterone to elevate the level of this hormone in their blood to the optimal level for health. I define this level as the hormone level found in a 25 to 35 year old adult at their peak of health. This is the optimal level for increased energy and healing to occur!

If you are experiencing progressive weight loss or a declining body cell mass *do not hesitate* to use one or more supplemental anabolic hormones as part of your treatment program. They can greatly enhance both the quality and quantity of your future years. However, I do not support supplementing anabolic hormones just for the sake of appearance or for building body cell mass above 100% of ideal levels.

Testosterone

Testosterone is the hormone responsible for the masculinizing and tissue-building changes which occur in

male adolescents. These include the maturing of the genitalia and the development of secondary sexual characteristics such as hair growth. Women also produce testosterone, though only at about 10% of the level produced by men.

Several studies have shown that testosterone levels are frequently decreased in people with fatigue and immune deficiencies. Research performed by Marc Hellerstein and colleagues at the University of California Berkeley has shown that the mean testosterone level of healthy, asymptomatic HIV(+) men is significantly lower than that of HIV-negative controls. His data suggest that sub-optimal testosterone production in HIV(+) males is an extremely common occurrence. One might postulate from this and other studies that early hormone supplementation to restore an optimal testosterone level might play an important role in an HIV(+) individual's maintaining long term health and a high quality of life.

Keeping your testosterone level in the optimal range is important for maintaining a healthful body cell mass as well as for preventing fatigue, depression, and diminished sex drive. As I previously stated, the *optimal range* for testosterone in HIV(+) men is not the same as the normal range commonly reported by most labs. The normal range for total testosterone in men is usually listed as 200-1000 ng/dl. The *optimal range* is 500-1000 ng/dl. This level is more effective at helping build and maintain body cell mass while still remaining within safe parameters.

Finally, testing the free testosterone level, as opposed to the total testosterone level, is more expensive but also *much more sensitive at picking up a borderline testosterone*

deficiency. It is more important when evaluating women patients to use the free testosterone test.

Testosterone Delivery Systems

Injectable Testosterone

Injectable testosterone is commonly used to treat testosterone deficiency. The injectable form, usually injected deep into the gluteus muscle every two to three weeks, ameliorates the underlying testosterone deficiency but can initially cause very high levels of testosterone in the blood. An injection of intramuscular testosterone usually results in a peak level above the limit of normal for several days followed by a gradual decline during the next two weeks. This promotes an increased risk of side effects such as headaches, anxiety, insomnia, irritability, mood swings, aggressive behavior, muscle tension, and testicular atrophy (shrinkage). This pattern of testosterone release is different from the body's normal testosterone release pattern which provides a fairly steady blood level throughout the day. That is why testosterone creams, applied once or twice daily, are currently my preferred testosterone delivery system.

Testosterone Cream

Natural testosterone can be mixed into a cream or gel so that it is absorbed shortly after rubbing it into the skin of the scrotum (in men) or the abdomen or thigh (in women). A compounding pharmacy with good quality standards is the best source for this type of application method.

AndroGel, a testosterone gel made by the Unimed Pharmaceutical Company, *cannot* be applied directly to the

scrotum and costs 5x as much as most compounded testosterone gels.

In my practice I use Kronos Pharmacy (800-723-7455) and recommend concentrations from 1% to 20% to be applied 1-2x per day depending on the particular individual's needs. After 1-2 months of use, a repeat blood test is all that's necessary to fine-tune the dosage so you can stay in the optimal range for healing. Testosterone preparations always require a prescription.

By administering testosterone in this fashion, you can most closely approximate the normal way your body releases testosterone into the bloodstream.

Testosterone Patches

There are two forms of testosterone patches currently available. The scrotal testosterone patch (Testaderm) is applied daily in the morning to a clean, dry scrotum which has been trimmed of hair. The Testaderm patch effectively increases the testosterone level into the normal range in most individuals yet it is often found uncomfortable to wear every day and sometimes falls off.

A second type of testosterone patch can be applied to the upper body usually on the back or anterior abdomen. At the present time, testosterone body patches are made by two companies. Alza Pharmaceuticals makes Testaderm TTS, which stands for testosterone transdermal system, and Smith-Kline Pharmaceuticals makes Androderm. Both patches are similar in their effect but the Testaderm TTS patch is thinner, less bulky, and not as often associated with skin irritation. If skin irritation does occur, the application of triamcinalone 0.1% cream (available by prescription)

underneath the patch can eliminate this side effect in most cases.

Hormone Balancing For Immune System Support – DHEA (Dehydroepiandrosterone)

In short, DHEA protects your body from the physical effects of stress. Too little DHEA can promote autoimmune diseases, chronic fatigue, heart disease, and depression and more doctors should be testing its level in their patients and supplementing it when they find it to be low.

First of all, let me state straight out that I do not agree that DHEA should be sold as an over-the-counter supplement. Hormones are very potent substances that should be fine-tuned and balanced with the use of state of the art blood testing. Only a physician can order these tests and monitor your hormone needs at regular intervals. Many people take DHEA who don't need it, many people take too much of it when they only need a little, and many people take less than what they truly need.

DHEA can be thought of as your body's protector from stress. It soothes and buffers your brain, nervous system, immune system and cardiovascular system from inflammation. After years of living with cancer, HIV infection or chronic psychological stress, your DHEA level can fall to a tenth or less of its optimal level. DHEA deficiency is also commonly seen in autoimmune disorders such as rheumatoid arthritis and lupus.

As I mentioned in my last E-newsletter, there is a BIG difference between the "normal range" for hormones as reported by most laboratories and the "optimal range for

healing” which I define as the upper limit of the laboratory’s stated normal range.

This is especially true for DHEA.

First of all, it is important that you monitor your DHEA level with a *DHEA-Sulfate test*. It is cheaper and far more accurate than a plain DHEA blood test. Just make sure DHEA-Sulfate is written on your lab slip. If your doctor forgets to put Sulfate down next to DHEA, feel free to write it in!

Next, the optimal level of DHEA to have in your system is the amount that you had when you were in your late twenties and early thirties. This is the level that supports your body for optimal health.

For men, this level is 300-600 ug/dl and for women it is 100-300 ug/dl on the DHEA-Sulfate test. Depending on your starting point, 10-50 mg for women and 50-200 mg for men is the most common dosage that I find myself prescribing. Remember, do not self-prescribe DHEA!

Clinical Experience

Since 1994 I have prescribed DHEA to thousands of patients in order to bring their levels into the optimal range. By keeping DHEA in this range, many of my patients have regained a healthfully functioning immune system.

Patients feel better, have more energy, and appear to be less susceptible to the negative effects of stress. In addition to using healthful nutrition, vitamin therapy, and aggressive medical intervention when necessary, DHEA

supplementation has helped the vast majority of my patients remain healthy and stable for many, many years.

Common Sense and DHEA

There are no human hormones that, in an effort by physicians to restore normal homeostatic balance to the body, are not supplemented if found to be below normal levels by a blood test. Insulin, estrogen, testosterone, growth hormone, cortisol, and thyroid hormone are all supplemented if their levels are found to be low. Just because we haven't fully documented all of the subtle beneficial effects of DHEA, or found that a deficiency of it causes an acute short-term problem, we assume that supplementation is not necessary. How arrogant and shortsighted we physicians can be!

Because the beneficial effects of DHEA are subtle, studies to identify its benefit should look for a lessening of symptoms, a maintenance of healthful weight and muscle mass, and an improvement in quality of life over the long term. They should also look for improved trends in disease progression and mortality as markers of its overall effect. These studies should utilize the dosage necessary to optimize blood levels, not pick an arbitrary dosage that assumes everyone's need for DHEA is the same.

For those readers who would like to review a list of research studies investigating the role of DHEA supplementation in the treatment of HIV disease, please click on the following link: <http://www.jonkaiser.com/research/studiesdhea.html>

Finally, it is important to realize that the level of hormones in the body need to be carefully balanced for optimal energy, vitality, and immune function to exist. Testosterone, DHEA, and thyroid hormone make up an important triad of

hormones that, when correctly balanced and monitored, can help you achieve a state of optimal energy and overall health.

Hormone Balancing For Immune System –Thyroid

The use of thyroid hormone supplementation is an extremely controversial topic. Even deciding which lab tests to use as a means to determine whether or not to begin supplementation, as well as how to monitor your dosage, is hotly debated.

No physician would disagree with providing thyroid supplementation to a patient, who has multiple symptoms of low thyroid function *combined with abnormal lab tests*. However, the majority of debate centers around whether it is useful, as well as healthful, to offer thyroid supplementation to patients who have some of the symptoms of low thyroid but whose lab tests are still within the normal range.

I will try to guide you through this complex topic by first describing the most common symptoms of low thyroid followed by information on the correct lab tests to check. In Part Two (see April's E-newsletter), I will describe the different types of currently available thyroid supplements, as well as how to best utilize them in your healing program.

Please understand that since this is a newsletter forum, the discussion of this topic must remain somewhat general. However, I will do my best to provide you with as much information as possible. It is then up to you and your physician to decide if thyroid supplementation is right for your medical needs.

Symptoms of Low Thyroid

It is important to realize that the majority of low thyroid symptoms can be reproduced by many other conditions. Just because a person feels tired and fatigued by no means indicates that thyroid supplementation is necessary. In fact, treating fatigue with thyroid supplementation alone can be a huge mistake; if the energy it provides in the short term masks the true underlying reason for the fatigue...which then goes untreated.

Conditions that have similar symptoms to low thyroid include but are not limited to: diabetes, low adrenal function, depression, Chronic Fatigue Syndrome, and heavy metal toxicity to name but a few.

Again, treating fatigue with a thyroid supplement alone can be a huge mistake if the true reason for the fatigue is not addressed.

The most commonly experienced symptoms of low thyroid function include: fatigue, lethargy, foggy thinking, depression, cold intolerance, constipation, painful menstruation, dry skin, thinning hair, and weight gain.

Since many people have one or more of the above symptoms, it is important not to jump to the conclusion that your thyroid output is low. A careful and thorough medical history, combined with a physical exam as well as appropriate lab testing, must be used to arrive at the correct diagnosis.

Lab Testing

The most obvious indication of significantly low thyroid hormone output is an elevation of serum TSH (thyroid stimulating hormone). This hormone is released by the hypothalamus at the base of the brain and is responsible for stimulating the thyroid gland to produce a higher output of thyroid hormone (T4) to the body. If the TSH level is abnormally high, there is a clear deficiency of thyroid hormone and supplementation is warranted.

Two other useful thyroid function tests are the free T4 and free T3. These can be measured as either total or “free” levels. Testing the “free” T4 and “free” T3 levels are more useful since what is not available as “free” hormone is bound to large protein molecules in the blood and generally unavailable for use by the body.

While there are many opinions on how to interpret the free T4 and T3 tests, I will tell you what has worked extremely well in my practice over the years. It is similar to my philosophy with evaluating other hormone levels that are important for providing energy and immune support to the body.

As I mentioned in my previous two E-newsletters, there is a BIG difference between the “normal range” for hormones as reported by most laboratories and the “optimal range for energy and immune system support”. I define optimal hormonal range as the upper half of the laboratory’s stated normal range. Therefore, if you add the upper and lower limit of the lab’s normal range together and divide by two, you will get the midpoint of the range. The optimal range is between this midpoint and the upper limit of normal.

When monitoring thyroid hormone levels, especially if you are symptomatic and could benefit from greater energy and

enhanced immune function, the preferred level for your free T3 and free T4 hormones is in the upper half of the lab's stated normal range. If you achieve levels in this range, you will feel your best and have the highest level of immune function.

In Part Two of this report on thyroid function, I will review the available thyroid supplements and the most common way I advise my patients on how to initiate treatment and monitor their dosage. Finally, I would like to make the important point that supplementing thyroid hormone without first supporting your adrenal function (DHEA, testosterone, vitamins, herbs, and adequate rest) can be detrimental to your long term health. That is why hormone balancing should be left to physicians with a lot of experience in this area.

Thyroid Supplementation

Once a decision has been made to begin thyroid supplementation based on a careful medical history and a thorough physical exam, the next important decision is what formulation to begin using.

There are essentially three schools of thought. The first group believes that supplementation should be taken in the form of a "natural" product such as that found in Armour thyroid. This formulation is produced by collecting porcine (pig) thyroid glands after the animal's slaughter, dehydrating the whole gland, and encapsulating the powder in a measured amount which is then prescribed to patients. The hypothesis behind prescribing thyroid hormone in this fashion is that the patient receives both kinds of thyroid hormones (T3 and T4) as well as a number of currently unrecognized "essential factors".

My personal belief regarding this method of thyroid supplementation is that you are getting imprecise amounts of animal thyroid hormones plus other animal proteins with poorly documented effects that may end up having both positive and negative effects. Also, the hormones in this thyroid preparation are not of human origin. Therefore, I do not prescribe this type of supplementation very often.

A second school of thought is to use the thyroid preparation known as T3. A commonly prescribed brand name for this hormone preparation is Cytomel. Cytomel can be obtained at standard or compounding pharmacies. T3 is the form of thyroid hormone most commonly found in the body's tissues after its conversion from T4 (the thyroid hormone released directly by the thyroid gland itself). While T3 can often be effective at ameliorating the symptoms of low thyroid output, it has an extremely short lifetime in the bloodstream and must be taken at least twice a day unless prescribed in a time release formulation. In my opinion, the time release formulations of T3 have not been adequately standardized nor compared to the tried and true method of prescribing thyroid hormone, that of taking the exact hormone released from the human thyroid gland itself...T4.

T4 is produced by several pharmaceutical companies under the brand names Levothroid, Levoxyl, and Synthroid. Though produced in a laboratory, the final product is absolutely identical to the hormone your own thyroid gland produces. The dosage is standardized to increments of 12.5 micrograms (mcg). Therefore the dosage can be fine tuned in very small increments to meet a patient's needs.

One important thing to know about this kind of thyroid supplement, is that the only pill strength *without any added*

artificial colors, binders, lubricants, or lactose is the 50 mcg strength. The main reason certain patients occasionally report unusual reactions to these brands of thyroid hormone is that they were prescribed a dosage other than 50 mcg and reacted to the additives, not to the hormone itself.

Therefore, my preferred method for prescribing thyroid hormone is to begin with one tablet of 50 mcg strength T4 (using one of the above-mentioned brands) to be taken for 3-5 days followed by an increase of an additional 1/2 tablet every week until a total dosage of somewhere 100-150 mcg (2-3 tablets) is reached.

If at any point during this ramp up period symptoms of agitation, nervousness, sweating, palpitations, insomnia, aggressive behavior, and/or anxiety occur, the dosage should then be returned to the previously well-tolerated level. Sometimes, one day of skipping a dose may be necessary to quickly ameliorate any of the above symptoms. The exact ramp up instructions are carefully individualized for each patient.

The taking of thyroid hormone *must be supervised by a physician.* Caution should be exercised in prescribing thyroid supplementation to patients with heart disease, angina, palpitations, hypertension, anxiety, bipolar disorder, irregular heartbeat, migraine headaches, and/or a history of stroke.

Update on Thyroid Hormone and the Immune System

In a recent answer that I posted on the “Ask Dr. Kaiser” section of my website, I stated that hypothyroidism was not more common in people with HIV infection. One of my readers politely pointed out that this statement was not true.

He then directed me toward a recent study which showed an association between HIV infection and hypothyroidism.

A French study ran between May and December 2001, and included a cohort of 350 patients. Thyroid function was assessed by measuring levels of thyroid-stimulating hormone (TSH), free T4 (FT4) and free T3 (FT3).

The French investigators concluded that HIV-infected individuals treated with D4T-containing HAART regimens, or with low CD4 cell counts (less than 200 cells/mm³), were at increased risk of developing hypothyroidism. Their results were published in the August 2003 edition of *Clinical Infectious Diseases*.