

# APOTHECARY OPTIONS

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## Frequently Asked Questions about Andropause (Male Menopause) and Testosterone Replacement Therapy

### ■ What is andropause or “male menopause”?

As men and women age, there is a natural decline in the body’s ability to produce hormones. When this change occurs in women it is referred to as **menopause**. In men it is called **andropause**. The condition was first described in medical literature in the 1940’s and the term andropause was first used in a medical article in 1952. In women, menopausal changes occur quickly and the physical symptoms are very noticeable (hormones fluctuate like a roller coaster ride). In men, andropause occurs over a longer period of time (typically 10-15 years) and the changes are gradual and far more subtle – but no less significant. Male menopause is not a myth. A recent survey found that 70% of the general public believes that men experience a mid-life stage similar to menopause in women.

Testosterone is to men what estrogen is to women. Testosterone is the hormone responsible for normal male sexual behavior (virility), and is involved in many metabolic processes such as lipid metabolism, glucose metabolism, and bone and muscle development. 95% of testosterone is produced by the testicles in response to signals from the brain. A small amount is produced in the adrenal glands. A normal adult man produces approximately 4-7 mg of testosterone per day. Every male experiences a drop in “free” (“bioavailable”) testosterone as they get older, and the amount of decline varies from man to man. Free testosterone is the active form of testosterone in the body. Free testosterone can move throughout the body to perform its designated functions. Starting around age 30, testosterone levels in men begin to drop. By age 50, the brain signal to make more testosterone has weakened significantly and a man’s testosterone level has dropped by about 40% from the peak levels of his younger years. Further aggravating this problem is the body’s production of **Sex Hormone Binding Globulin (SHBG)**, which increases by 1-2% per year after age 40. SHBG is a blood protein that attaches to testosterone. Once testosterone is bound to SHBG it becomes unavailable for use. Protein-bound hormones are not fully biologically active. Only unbound (free) testosterone is active in the body.

Another contributing factor to the onset of andropause is the increased production of **aromatase**. Aromatase is an enzyme found in the body that converts testosterone into estradiol (a potent natural estrogen). As men age, their bodies produce larger amounts of aromatase, which causes a shift in the ratio of testosterone to estrogen. In younger men the ratio of testosterone to estrogen approximates 50:1. In older men the ratio drops to 20:1 or even as low as 8:1. As estrogen levels in a man increase, the effects of testosterone are cancelled and estrogenic effects, such as enlargement of the breasts, weight gain, and prostate problems can develop.

Men are always taught to rise above their afflictions and not show any signs of weakness. The fact that andropause comes on so gradually, coupled with men’s stubbornness and pride, doesn’t allow them to openly talk with doctors, family, and friends about the changes they are experiencing. Andropause is a health problem that responds rapidly to treatment. It has gained international acceptance as a medical condition, and physicians are becoming increasingly aware of the effective treatment options available.

***“If I’d known I was gonna’ live this long, I would have taken better care of myself.”***

*---Jimmy Durante*

Hormones do not decline because we age ---

--- We age because our hormones decline.

## ■ What are the symptoms of andropause?

1.  Decreased energy (fatigue, tiredness), and reduced strength and stamina in both work and play.
2.  Increase in body fat, especially around the midsection.
3.  Decreased mental acuity and concentration, impaired decision making abilities, and forgetfulness.
4.  Development of osteoporosis – estimated that 1 in 8 men over the age of 50 have osteoporosis – characterized by a rounding of the shoulders and a loss of height. Osteoporosis puts men at an increased risk of fractures. Wrists, hips, spine, and ribs are commonly involved.
5.  Decrease in sex drive, sex desire, strength of orgasm, and erectile function. Is your only desirable bedroom activity “getting a good night’s sleep?”
6.  Loss of competitiveness. Increased passivity & lassitude.
7.  Decreased eagerness/enthusiasm/enjoyment of life.
8.  Loss of self-esteem, increased anxiety, nervousness, and development of depression.
9.  Decreased physical agility and athleticism.
10.  More sad, angry, and/or grumpy than usual.
11.  Deterioration in your work performance.
12.  Low testosterone has been associated with an increased risk of cancer, heart disease, diabetes, and immune disorders.
13.  Breast tissue development (gynecomastia) – caused by higher estrogen levels and lower testosterone levels.

## ■ Take our andropause quiz. Using the list above, put a check next to the symptoms you are experiencing.

How many boxes did you check? If you checked symptom #5, or if you checked more than a couple of boxes, you should consider making an appointment with your prescriber. It is certainly possible that other health problems could be causing some of your symptoms and it is important that you have a thorough medical evaluation to identify them. However, if you are in generally good health and haven’t had a lot of medical problems in your life, your symptoms could be simply from low free testosterone. Encourage your prescriber to order a test of your free-testosterone level -- see what the results show.

## ■ Tell me more about the test to determine if I have low testosterone?

You should have a blood test or a saliva test that measures **bio-available (free) testosterone**. Do not confuse this test with a **total testosterone** test. The American Association of Clinical Endocrinologists (AACE) recommends checking levels of free testosterone when evaluating for male sexual dysfunction. Unfortunately, total testosterone is the test most often measured when men go to their doctor with andropausal complaints. A recent report showed that only 13% of men with andropause symptoms had low total testosterone, yet 74% of these same patients had low bio-available (free) testosterone. Remember that it is only the free testosterone in your body that is active. An estimated 50% of men over the age of 50 have free testosterone levels below the lowest level of normal 30-40 year old men. Most of your testosterone is bound by SHBG in the blood. A total testosterone determination cannot distinguish how much is free and available. It is quite possible that you could have a normal total testosterone level but a low free testosterone level. If your doctor is only checking your total testosterone, and it appears normal, he/she may conclude that your symptoms are being caused by something else such as depression or stress. Ironically, the majority of medications used to treat depression and chronic stress have adverse effects on sexual function.

Saliva testing is popular with many patients because it is convenient and noninvasive. Saliva samples and test kits can be sent via the mail. The best time to test for bio-available testosterone is usually in the morning, due to the night and day cycle peaks of testosterone. It takes 8-10 days to get your results. Discuss the testing options with your prescriber. Some insurance companies will pay for saliva testing. Apothecary Options offers home saliva testing kits free-of-charge to our patients. Patients submit payment directly to the lab when they mail their saliva samples for processing. **Apothecary Options receives no kickback or financial reimbursement from the laboratory for recommending saliva testing to our patients.**

## ■ What are some of the reported benefits of testosterone replacement?

- Significant increase in libido (sex drive and sex desire).
- Improvement in the quality and frequency of erections, and strength of orgasm.
- Increase in muscle mass and strength (handgrip, leg strength, and arm strength).
- Increase in bone density above the fracture threshold. Bone density in the spine and increased strength in the paraspinal muscle area are commonly observed following replacement therapy.
- Decrease in visceral fat.
- Improvement in mental function (critical thinking and decision making ability), and verbal fluency.
- Improved athletic agility and performance, and restoration of competitive edge.
- Increased endurance (as measured by an increase in treadmill time in men limited by coronary artery disease. In studies, testosterone has been shown to increase dilation of coronary arteries in men and increase exercise tolerance).
- Improvement in lipid profile (decreased triglycerides, increased HDLs, lowered LDLs) with physiological replacement doses. Note – excess testosterone supplementation has been shown to have the opposite effect on lipid/cholesterol metabolism.
- Improvement in blood sugar control (testosterone decreases insulin resistance, which is a major cause of type 2 diabetes).
- Improvement in an overall sense of well-being and friendliness. Many men thought they were just depressed until they experienced the dramatic changes that occur with responsible testosterone replacement.
- Decreased anger, irritability, sadness, tiredness, and nervousness.

## ■ What not to expect from responsible testosterone replacement.

Over the last few years, testosterone replacement therapy has received a lot of bad publicity largely due to concerns of abuse – especially among athletes and bodybuilders. Responsible testosterone replacement therapy is intended to produce and maintain physiologic concentrations of testosterone, without providing unnecessary and potentially dangerous excess. Doses should be individually tailored to adequately alleviate andropausal symptoms without causing side effects or safety concerns. Responsible testosterone supplementation will not:

- Help you bench press more than your workout partner.
- Allow you to participate in bodybuilding competitions.
- Return your randiness to that of an 18 year-old.
- Allow you to recapture your lost youth.

## ■ I don't have prostate cancer but there is a history of prostate cancer in my family. Is testosterone supplementation safe for me?

First, there is no medical evidence that testosterone causes prostate cancer -- if that was so, 19-20 year old men, who have the highest levels of natural testosterone, would also have the highest incidence of prostate cancer. In addition to genetic factors, dietary factors and environmental factors influence the development of prostate cancer. Many physicians are convinced that prostate cancer is actually caused by too much estrogen and too little testosterone in a man's body. In young men, the ratio of testosterone to estrogen is 50:1 and they have a lower risk of prostate cancer. In older men the ratio is less than 20:1 and they have a higher risk of prostate cancer. Many physicians believe that testosterone supplementation actually reduces the chances of developing prostate disease by helping to counter the adverse effects of estrogen buildup.

There is strong evidence, however, that aggressive testosterone supplementation can aggravate pre-existing prostate cancer and its use is contraindicated in those patients. In men with undiagnosed prostate cancer (i.e. men that have prostate cancer but just don't know it yet), testosterone supplementation may make the cancer appear sooner. Because prognosis and treatment options for earlier detected cancer are much better than for later diagnosis, many physicians believe that the benefits of replacement therapy, in men with low free testosterone and symptoms of deficiency, clearly outweigh those risks. All men who are receiving testosterone replacement should be monitored closely (every 6-12 months) while on therapy.

Before starting on testosterone supplementation, men should be screened for prostate cancer by having, at a minimum, a baseline PSA (prostate-specific antigen) test, a DRE (digital rectal examination), and hematocrit level. We also recommend baseline testosterone and estradiol levels. An annual PSA and DRE are recommended for all men using testosterone replacement. Prostate cancer has a strong genetic link in families. If your father, brother, uncle, or grandfather had/has prostate cancer, consult with your physician before beginning a testosterone replacement program.

### ■ **Does testosterone correct Erectile Dysfunction (ED)?**

52% of men over the age of 40 have some degree of erectile failure. The loss of erectile capacity is an important issue for virtually every man. Sexual dysfunction causes significant emotional problems for both the man and his partner. For men, an inability to become erect leads to feelings of inadequacy, embarrassment, weakness, fear of further sexual failures (performance anxiety), and depression. His partner may also develop emotional issues such as doubts about her own attractiveness or questions about the man's faithfulness.

Erectile Dysfunction (ED), previously referred to as impotence, is an anatomical condition in which the veins in a man's penis do not fill with enough blood to achieve erection, or to maintain an erection long enough to complete intercourse. ED can be caused by an underlying health problem such as high blood pressure, high cholesterol, diabetes, heart disease, or depression. Other contributing factors of ED include smoking, alcohol use, certain prescription medications, drug abuse, and stress. ED is treated with medication such as Viagra® (sildenafil), which increases blood flow to the penis. Unfortunately, Viagra® doesn't work unless you are sexually stimulated. This is where testosterone plays an important role.

Low free testosterone levels are commonly found in men with ED. Testosterone is the hormone that increases sexual desire and sexual drive. In the body, testosterone acts both centrally (in the brain) and peripherally (in the penis, testicles, and blood vessels) to stimulate and maintain an erection. A man who is supplementing with natural testosterone will feel more sexual, will want to have sex more often, and will find it easier to become sexually stimulated and erect. While testosterone may not always cure ED, if poor sexual performance is really due to a lack of desire or drive, then testosterone is the remedy. A return of sexual desire is one of the most satisfying outcomes of testosterone replacement.

Many physicians are also prescribing testosterone for women. Women produce testosterone (about 1/10<sup>th</sup> as much as men do) and their production declines with age. Testosterone in women helps stimulate their sex drive, increases mental acuity, and helps prevent bone and muscle loss.

### ■ **Can I take testosterone with Viagra®, Levitra®, or Cialis®?**

Yes, testosterone works in different ways and can potentiate the effects of the other medications. Evidence suggests that 95% of ED problems are resolved when Viagra® and testosterone are co-administered. Even more intriguing, many patients find that they need a lower dose of Viagra® (or don't need it at all) when they start supplementing with testosterone. This makes testosterone therapy even more cost-effective when you consider the expense of Viagra®.

### ■ **What other types of diseases are treated with testosterone replacement?**

- ☞ Primary hypogonadism -- testicular failure due to: cryptorchidism, bilateral torsion, orchitis, vanishing testis syndrome, orchiectomy, Klinefelter's syndrome, AIDS, chemotherapy, or toxic damage from alcohol or heavy metals. These men usually have low serum testosterone levels and gonadotropins (FSH, LH) above the normal range.
- ☞ Hypogonadotropic hypogonadism (congenital or acquired) -- idiopathic gonadotropin or LHRH deficiency or pituitary-hypothalamic injury from tumors, trauma, or radiation. These men have low testosterone serum levels but have gonadotropins in the normal or low range.
- ☞ Testicular damage – replacement of testosterone following orchiectomy (castration) due to injury or cancer treatment.

## ■ Who should not be using testosterone?

Most medical experts agree that men with the following medical conditions should not use testosterone:

- Prostate Cancer
- Breast Cancer
- Patients with severe benign prostatic hypertrophy (BPH)-related bladder outlet obstruction.
- Liver disease
- Kidney disease
- History of venous thrombosis (blood clots)
- History of allergic reaction to anabolic steroids.

## ■ What are some of the reported side effects of testosterone?

In therapeutic replacement dosages, natural testosterone has few side effects. Side effects are more likely to occur with higher than normal replacement dosages. Side effects are generally an indication that your dosage needs to be adjusted. Possible side effects include:

- ◆ Changes in skin condition – acne, oily skin.
- ◆ Male pattern baldness – usually because of higher replacement doses and the conversion of testosterone to DHT (dihydrotestosterone) - a testosterone metabolite linked to male pattern baldness.
- ◆ Headache.
- ◆ Frequent or prolonged erections.
- ◆ Increase in breast size (a result of testosterone conversion to estrogen). If this occurs, reduce your dosage. We recommend having your estradiol levels checked regularly while using testosterone.
- ◆ Elevated hematocrit – this occurs with high doses and needs to be watched closely
- ◆ Testicular atrophy, decreased spermatogenesis - these symptoms can occur with high replacement doses and abuse of anabolic steroids due to feedback inhibition.
- ◆ Testosterone levels above the physiologic range for males may increase the risk of development of atherosclerotic heart disease.

## ■ Will my PSA increase while on testosterone replacement therapy?

A number of studies have looked at this. The general conclusion is that your PSA may rise slightly but only to normal levels. PSA is a good indicator of the effects of androgens on the prostate. Some patients with low free testosterone have very low PSA levels. When supplementation is prescribed for these patients, PSA increases to normal levels but not higher. Prostate size also does not increase during therapy.

## ■ Are there some dietary or lifestyle changes that will help my andropause symptoms?

### What to avoid:

- Excessive alcohol consumption – alcohol has a proven direct depressant effect on the ability to achieve and maintain erection. Alcohol also causes a rise in estrogen levels in the body. Estrogen in women can rise dramatically just after one drink. Alcohol also decreases zinc concentrations in the body. Adequate zinc levels are needed because zinc inhibits aromatase levels in the body.
- Tobacco use – nicotine cause vasoconstriction of blood vessels including the vessels that are trying to bring blood to the penis to achieve erection. Research shows that heavy smokers have a greater incidence of erectile dysfunction than non-smokers.

### What to improve:

- Regular exercise – increases the body's production of testosterone, decreases visceral fat (reduces aromatization), lowers blood pressure, and improves circulation, all of which helps with erectile dysfunction. **Lose Weight** – fat cells contain aromatase and obesity causes more conversion of testosterone to estrogen.
- Change your diet. High fat diets and pesticide residues in food increase your estrogen exposure. Eat more cruciferous vegetables (broccoli, cauliflower, cabbage, Brussels sprouts, radishes, Bok Choy, collard greens) – these vegetables contain potent anti-oxidants and have strong anti-cancer fighting

properties. They contain indole-3-carbinol (I3C) which helps minimize testosterone aromatization to estrogen. In the presence of stomach acid, I3C combines with itself to form DIM (di-indolyl methane). Studies have demonstrated that DIM reduces the incidence of prostate enlargement. DIM acts as an active surveillance for cancer cells. DIM and I3C are available as supplements from most quality health food and vitamin stores.

- Watch your caffeine, alcohol, and sugar intake - these are all “testosterone robbers.”
- **Zinc supplementation** – zinc inhibits aromatase levels in the body. Zinc is necessary for normal pituitary function. The pituitary gland sends the signal to the testes to produce more testosterone.
- A good multivitamin + mineral product daily. Supplement with extra Vitamin C and Vitamin E. Both are potent antioxidants. Vitamin C (1000 mg/day) decreases aromatase activity. Vitamin E (200 iu/day) is also said to help improve sex drive and function.
- Selenium supplementation (50-200 mcg/day) - selenium levels are important for testicular and prostate function. Selenium helps increase the antioxidant effects of vitamin E and the amino acid glutathione. Low selenium levels are linked to prostate cancer.
- Saw Palmetto is an herb that prevents the conversion of testosterone to dihydrotestosterone (DHT). Increased DHT levels contribute to male-pattern baldness and cause prostatic enlargement. Saw Palmetto also blocks the effects of estrogen on the prostate thus minimizing the growth stimulating effects of estradiol.
- Better stress management. Chronic stress causes an increased secretion of endogenous epinephrine, which causes vasoconstriction and aggravates sexual dysfunction. Chronic stress also increases cortisol levels which causes an increase in abdominal fat and leads to increased conversion of testosterone to estrogen.

#### ■ **What about the use of testosterone in patients with type 2 diabetes?**

There appears to be a strong correlation between low levels of testosterone and the development of type 2 diabetes in men. Type 2 diabetes occurs for different reasons. In some patients it is because the pancreas, which is responsible for insulin production, just doesn't produce enough to adequately control blood sugar. For other patients, the cells throughout the body develop what is known as *insulin resistance*. This second group of patients produces enough insulin, but the body's cells can't use it effectively. Testosterone supplementation has been shown to reduce insulin resistance in male diabetic patients – this may actually allow them to decrease their need for insulin shots and/or diabetic medications.

#### ■ **Someone told me that testosterone is converted to estrogen. How does that happen?**

Did you know that a male, age 55, may actually have a higher level of estrogen than his 55 year-old spouse? As women get older estrogen production declines. As men get older estrogen levels tend to **RISE** in part due to a process called **aromatization**. Aromatization occurs when the enzyme **aromatase** stimulates the conversion of testosterone into estradiol (also known as E2). Estradiol is a potent natural estrogen. Menopausal women have been using it for years to control hot flashes and night sweats. Aromatization occurs primarily in fat tissue. Beginning in their mid-40's, men start becoming feminized by estrogen due in part to the following contributing factors:

- Men have an age-related natural decline in testosterone production that causes a loss of muscle mass and an increase in flabbiness.
- The increased body fat causes more testosterone to be converted to estrogen due to aromatization.
- The increase in estrogen causes an increase in the production of Sex Hormone Binding Globulin (SHBG). SHBG has an affinity for testosterone. SHBG binds to “free” (unbound) testosterone in the blood. Only free testosterone is able to exert its effects in the body. Thus the higher amount of SHBG reduces free testosterone and exacerbates the build-up of estrogen.

**Dr. David Zava – founder of ZRT labs in Oregon, has done some outstanding work looking at hormone profiles of women and men and how they correlate with specific cancer risks. The following table is a summary of his findings**

## Analysis of Hormone Profiles and Risk of Cancer

Increased Risk of Breast Cancer in Women	Increased Risk of Prostate Cancer in Males
High Estradiol (E2)	High Estradiol (E2)
Low Progesterone	Low Progesterone
High Testosterone	Low Testosterone
Low DHEAS	Low DHEAS
High Night Cortisol	High Night Cortisol

From the book What Your Doctor May Not Tell you about Breast Cancer by Drs. John Lee and David Zava

### ■ Are there ways to minimize the aromatization of testosterone to estrogen?

Two of the most important factors in minimizing the conversion of testosterone to estrogen are:

- Supplement with the correct replacement dosage and frequency. Excess testosterone supplementation can encourage aromatization to estrogen. The body is unable to adequately store unneeded testosterone. When supplementing with testosterone it is always best to use lower doses and administer them more frequently than to give large single doses. Frequent application is also better at maintaining circulating testosterone levels and discouraging binding to SHBG.

Supplement with the correct delivery method. Most experts agree that daily applications of topical testosterone provide consistent levels of testosterone and more mimic the production and release of testosterone in your body. One of the disadvantages of testosterone injections is the “Peak and Valley” effect. When you get an injection of testosterone you get a high initial surge of testosterone followed by a decline over the next week or two. This is not how testosterone is secreted naturally in the body. Men who use the injections, feel great for a few days and then lose that feeling as their testosterone levels decline. Topical testosterone helps maintain consistent levels each day.

Oral tablets have some distinct disadvantages and should be avoided. First, liver abnormalities have been reported in patients receiving oral testosterone. Methyltestosterone (Android®), an oral, synthetic testosterone, has been linked to liver toxicity when administered in higher doses. Second, the synthetic testosterone used in commercially available oral tablets is not the same as 100% natural testosterone and the body processes it differently. Finally, oral tablets release the entire amount of drug at once – this occurs the moment the tablet is dissolved in the stomach and absorbed into the bloodstream. Oral tablets do not mimic gradual testosterone secretion in the body.

### ■ Why is topical application of testosterone a preferred method of administration? What distinguishes our product from the others?

- When applied topically, testosterone cream or gel is absorbed through the skin and directly into the bloodstream -- thus bypassing the liver. This allows a lower total dose of testosterone to achieve the same results, without harmful effects on the liver.
- Our specially formulated testosterone cream or gel provides more sustained blood levels throughout the day than compared to gel-based formulations. Patients do not report the “surge” of testosterone, or experience the afternoon “crash.”
- Our testosterone creams and gels are concentrated. That means you don’t have to slather on a handful of product to get the prescribed dose. Our gel base doesn’t feel sticky when applied.

The cream base we use is a proprietary blend that was specifically formulated for testosterone replacement. We believe that it is the best HRT base available. Even though it is more expensive than other bases, we are still able to provide it to our clients for **less than what many pharmacies are**

**charging.** Our cream delivers 100% natural testosterone, which is indistinguishable from what your body produces naturally. Micronized testosterone is absorbed from the cream base into the subcutaneous and muscle tissue, and then slowly into the bloodstream. This gradual delivery mimics the body's own natural testosterone secretion pattern. The skin acts as a drug reservoir. After a week or so of regular use, consistent blood levels can be maintained and high peak levels are avoided. Remember, higher peak levels are reported to stimulate more SHBG binding to free testosterone.

Testosterone cream can be applied once in the morning, or twice daily (1/2 of the dose in the morning and 1/2 in the late afternoon). Most men prefer the convenience of applying the entire dose in the morning. Either method is acceptable. Direct application to the penis is not necessary, and not recommended. Fatty areas of the body should be avoided because drug absorption is more variable from these sites and testosterone can be converted to estrogen in fatty tissue. One preferred application site is the muscular outer area of the arm between the wrist and elbow – this area provides a good combination of subcutaneous and muscle tissue without a lot of fatty tissue. Another good application spot is on the outer area of the thigh. We recommend that you rotate application sites for best results.

**The potency of our testosterone creams and gels are routinely analyzed by an independent testing agency (Eagle Analytical Services)**

### ■ What dosage do you recommend?

- First, ask your doctor for a testosterone saliva or blood test (free testosterone only) **and** an estradiol test before you start therapy to establish a baseline reference point for each.
- Start on a **low, physiologic dose**. Healthy adult men produce approximately 4-7 mg of testosterone per day. We recommend that men start supplementing with testosterone at doses of 10-20mg per day (the difference accounts for any issues affecting topical absorption). It is always best to start low and go slow. You can increase your dosage if your levels are still too low.
- After 3-4 months of therapy, have another saliva test for testosterone and estradiol. Checking your estradiol level will indicate how your body is processing the testosterone. If your free testosterone levels are low and you are still experiencing some andropausal effects, discuss with your prescriber about gradually increasing your dosage. Some prescribers tend to be more aggressive with respect to testosterone replacement than others. If your doctor is checking blood levels, you may need higher testosterone dosages to raise the levels of testosterone in the blood.
- The goal is to provide a replacement dose that alleviates your symptoms without causing down regulation or feedback inhibition. Doses in excess of your replacement needs are associated with greater risks and side effects without any increase in benefits.

### ■ What is Feedback Inhibition?

Feedback inhibition is one of the body's responses to excess testosterone supplementation. When the brain senses that you have too much testosterone coming from outside sources it will begin to shut down your own natural testosterone production. Ultimately, this can lead to testicular atrophy (shrinking of the testicles), and decreased spermatogenesis (reduction in sperm production). Feedback inhibition is a problem that occurs with bodybuilders who are using high doses of anabolic steroids. Supplementing with a low dose of testosterone should not interfere with your body's own natural production.

### ■ What is Down-Regulation of testosterone receptors?

Down-regulation is another safety response mechanism the body uses when exposed to excessive testosterone supplementation. When down-regulation occurs, testosterone receptors in the body become resistant to the effects of testosterone. Down-regulation is reported when men supplement with doses much greater than what is required physiologically.

In these men, when they first begin testosterone replacement they feel great, but after a couple of months they notice that the testosterone doesn't seem to be working for them as well as it did when they first



started using it. Without checking saliva levels, their doctor may recommend an increased dose. This causes a temporary fix and the men feel great again, but after another couple of months they reach yet another plateau where the testosterone just doesn't seem to be working. They try another increase in dosage and the same thing occurs. This is the classical presentation of the down-regulation of testosterone receptors. When it comes to testosterone replacement, if the initial good results wane after a few months, there is a good chance the dose is too high.

### ■ **What type of ongoing monitoring is suggested for patients taking testosterone replacement therapy?**

- PSA levels and digital prostate examinations
- Cholesterol levels (total cholesterol, HDL, LDL)
- Triglycerides
- Fasting Blood Glucose
- Complete Blood Count (CBC)
- Free Testosterone level (we recommend saliva testing due to its reliability and cost-effectiveness)
- Check your estrogen level with each testosterone determination.

### ■ **When should I start feeling better?**

- ◆ In the first two weeks of testosterone replacement, you can expect to notice an increase in mental quickness and an overall improved sense of well-being. The results are subtle.
- ◆ After about 3-4 weeks you should notice more energy and an increase in sex drive. You will have more spontaneous erections, night dreams, sexual daydreams, and an overall increased interest in sex.
- ◆ As you continue with your replacement therapy you will see continued improvement in energy levels, endurance, muscle tone, a decrease in body fat, and more enthusiasm for life's activities. You will find yourself wanting to spend less time on the couch with the TV remote control, and more time enjoying what life has to offer!

### ■ **Does testosterone replacement require a prescription?**

Yes. Testosterone is an anabolic steroid. Because of its potential for abuse among athletes and body builders, testosterone is regulated by the Drug Enforcement Administration (DEA). Testosterone can only be ordered by your prescriber (physician, nurse practitioner, or physician assistant) within the scope of his/her practice. All prescribers must possess a valid DEA license to prescribe testosterone replacement. As required by law, we will verify the legitimacy of all prescriptions. We will refuse to fill any prescription that does not meet the intentions and guidelines of responsible testosterone replacement.

### ■ **How much does it cost?**

It depends on your daily dosage. We have the best prices in California on topical testosterone replacement. Typical physiologic replacement dosages using our testosterone cream or gel costs **less than \$20 per month** when you order a 4-month supply. Commercially available patches (Androderm<sup>®</sup>) and gels (AndroGel<sup>®</sup>) cost anywhere from \$150 - \$300 per month depending on your dosage! Because we don't accept insurance up front, our goal is to offer testosterone to men at prices less than the co-pays charged by their insurance. For patients that would like to try to get reimbursed from their insurance company, we give all of our clients a detailed and completed insurance claim form that they can simply sign and submit directly to their insurance company. Many of our patients who submit claims receive partial reimbursement for the cost of their testosterone cream. Apothecary Options is committed to providing our patients with products of uncompromising quality at competitive prices. Plus we always offer **FREE SHIPPING ON ORDERS >\$60**

### **Shouldn't I just accept the fact that I am not as young as I once was?**

Only you can answer this quality-of-life question. Andropause (and menopause in women) occurs at a time when life is offering some of its greatest rewards, and greatest challenges. Unfortunately, many men are

told by their doctor that the symptoms they are experiencing are “just part of the aging process.” Grudgingly, they settle into old age.

We believe that kind of thinking was in the past. New information suggests it does not have to be that way. The effects of declining hormones have only become a recognized problem now that we are living longer. In 1900, the average life expectancy at birth for a white male was 48.2 years. By 2000, the life expectancy for white males had increased to 74.1 years. Men are living almost 30 years longer but with significantly lower amounts of testosterone, and higher levels of estrogen than our ancestors. **An estimated 8 million men are suffering the effects of low testosterone, yet less than 10% of them are receiving treatment.**

Hormone imbalance is associated with every major disease that plagues Western society (cancer, heart disease, osteoporosis, and diabetes). Declining hormones combined with poor lifestyle, poor diet, lack of exercise, and too much stress are largely responsible for our health problems and frailties in later life. Responsible testosterone replacement therapy is something to consider.

If you are considering responsible natural testosterone replacement, gather as much information as you can and learn about all the options available. Give a copy of this information to your prescriber.

Have a complete physical exam and get some saliva hormone level testing done. Make an informed decision about what is best for **your** body.

# Saliva Testing vs. Blood Testing

More than 95% of blood hormones in women and men are bound to specific proteins, which carry them throughout the bloodstream. The remaining amount (approximately 1 - 5%) represents your **free** (or *bioavailable*) hormones. As blood circulates around the salivary glands, your bioavailable hormones (those that are not bound by blood components) freely diffuse through the cells of the salivary gland and into the salivary ducts. Studies in the scientific literature have shown that there is a strong correlation between the levels of "free" hormones found in saliva and the bioavailable levels of hormones found in the bloodstream and tissues. The free portion of the hormone is what exerts an effect on the body. Free hormones can move throughout the body and into the cells of your organs and tissues to perform their designated functions. Protein-bound hormones are not fully biologically active. Some common blood tests only measure total hormone levels - which is the sum of the protein-bound portion plus the non-protein bound portion. These blood tests are unable to distinguish how much is free and available, versus how much is bound and unavailable. It is quite possible for a person to have a total hormone level in the "normal" range – yet still have a very low level of free hormone.

Saliva testing is becoming recognized as a non-invasive, reliable, and accurate way to measure free hormone levels and test for hormone deficiencies. Saliva testing only measures unbound (**free**) hormone levels. Saliva testing is more accurate than blood testing for topically administered hormones -- the preferred method for hormone replacement. For more information on saliva testing, visit [www.salivatest.com](http://www.salivatest.com)

**How often should levels be checked?** The goal of saliva hormone monitoring is to assess your level of imbalance and help determine whether hormone replacement therapy or another form of intervention is appropriate. If you are already taking hormones, testing will allow you to adjust your individual dosage, thus optimizing benefits while at the same time helping to minimize risks. Hormone levels should always be assessed initially to establish baseline levels and determine a starting point. Once hormone balance is achieved, check levels yearly. Check more frequently if you are still experiencing symptoms of hormonal imbalance.

**Women:** Check your Estradiol, Progesterone, Testosterone, DHEA, and Cortisol levels

**Men:** Check your Testosterone, Estradiol, DHEA, and Cortisol levels

Hormones in saliva are very stable. Samples can be stored at room temperature for extended periods (a week or more) without any loss of activity. Samples are shipped to the testing facility by regular mail – there is no need for special refrigeration. Saliva testing is a covered benefit by some insurance companies – *check with the individual laboratory to find out specifics about insurance coverage*. Patients can avoid any insurance delays by paying the out-of-pocket cost of approximately \$30 per hormone level tested (this is about 70% less than the cost of blood testing). Fees are paid directly to the lab.

### **Apothecary Options receives no financial compensation or kickback for recommending Saliva Testing**

Our bodies contain an estimated 60 trillion cells that all must communicate with each other. These cells respond to a special language that is orchestrated by our hormones. Hormones travel throughout the body and enter cells through receptor sites located on the cells. When a hormone attaches to a receptor it is similar to a key opening a locked door. Once inside the cell, the hormone gets to work, flipping switches and pulling levers that regulate mental and physical functions throughout the body. Hormones exist in harmony with each other. When our hormone levels are balanced in the right proportions, the body is happy and stable. When balance is lost, we become more susceptible to disorders and diseases (both physical and mental). Hormone imbalance is associated with every major disease that plagues Western society (cancer, heart disease, osteoporosis, and diabetes) and some medical experts theorize that hormone imbalance is a contributing factor in depression and certain types of mental illnesses.

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