

Low Testosterone

By Dr. Mitch Yadvan

Hormones are chemicals made in your body that act on another part of the body after traveling through the bloodstream.

Testosterone is a hormone which is naturally produced in both men and women, but is found in much higher levels in men. The majority of testosterone is made in the testicles in men with a small portion of it being made in the adrenal glands. In women it is made in the adrenal glands and ovaries.

Testosterone has been thought to be predominantly a "sex" hormone with the function of improving sex drive and helping maintain erections in men. Recent research has now shown testosterone to also have many other functions, including effects on metabolism, maintenance of bone strength, muscle integrity, cardiovascular health, support of the brain, cognition and mood, in both men and women. Additionally, evidence suggests testosterone deficiency can lead to other hormonal changes, which may then contribute to the development of type 2 diabetes. Lack of testosterone is also associated with decreased bone density and contributes to osteoporosis and osteopenia. Anemia, muscle weakness, impaired cognitive function, decreased motivational drive, fatigue, lethargy, and an overall decreased sense of wellbeing can also be seen in testosterone deficiency. Low testosterone levels are associated with increased mortality.

Circulating testosterone levels do fall with age; however, the rate of decline can be quite variable amongst different individuals. A large number of men will not have their testosterone levels fall until the 70th decade, whereas other men's levels will decline at a much younger age. For example, 20% of men older than 55 years of age will have low levels of testosterone. Bioavailable testosterone is the active form that has actual activity on the body's organs, which is only about 2% of a person's total testosterone. When bioavailable testosterone is measured, however, 50% of men above 50 years are defined as having low testosterone. This is why it is important to measure bioavailable testosterone when making clinical decisions about testosterone replacement.



Men May Experience the Following Secondary to Low Testosterone:

- Decreased Sex Drive
- Impotence
- Decreased Muscle Mass and Strength
- Increased Body Fat
- Memory Dysfunction
- Decreased Appetite
- Decreased Hair Growth
- Bone Weakness
- Decreased Red Blood Cells

Once the diagnosis of low testosterone (hypogonadism) is made, further testing should be pursued to help to determine the cause of the deficiency. Some causes can be:

- Aging
- Chronic Medical Conditions
- Acute Illness
- Alcohol Abuse
- Birth Defect
- Testicular Infection
- Testicular Trauma
- Head Trauma
- Medications
- Problems with the Pituitary Gland
- Environmental Toxins
- Chemotherapy
- Type 2 Diabetes
- Sleep Apnea

There is even evidence that nutritional deficiencies can contribute to low testosterone.

The medical history for evaluating low testosterone includes questioning about sexual desire, reduced nocturnal and morning erections, loss of drive, decreased physical energy, fatigue, depressed mood and irritability and even alterations in memory. One must realize that these symptoms as well as others reported by men with low testosterone, such as depression, difficulty concentrating, irritability, and insomnia are non-specific and may be related to other medical conditions as well.

Physical examination for this evaluation may or may not be helpful in making the diagnosis, as findings of low testosterone such as muscle weakness, reduced body hair, and abdominal obesity may also be seen in men with a number of other medical conditions. Additional findings may be small testicular size, abnormal hair distribution and enlarged breasts.

After a history and physical examination is done, the next step in the evaluation would be laboratory testing. Historically, two early morning blood samples drawn prior to 10AM, when blood levels are highest, are used to confirm the diagnosis of low testosterone.

Testosterone measurements can also be checked via saliva and urinary levels. The total testosterone can be used to calculate the free or bioavailable testosterone that is thought to be the active form of testosterone. Low levels can prompt the need for additional lab testing to check for potential causes of the low testosterone that may be correctable without testosterone replacement.





Testosterone can be converted to other hormones by different tissues in the body. These major hormones of interest are estradiol and dihydrotestosterone.

1. Estradiol

In peripheral fatty tissues, testosterone can be converted by the enzyme aromatase to estradiol which is a primary form of estrogen. This is one of the reasons overweight men may have enlarged breasts. Significantly elevated estradiol levels in men have been linked to increased mortality and to diabetes.

2. DHT

Another hormone converted from testosterone is dihydrotestosterone (DHT). In adult males, the two actions of DHT are on the prostate where it causes the growth enlargement and sometimes obstruction as is noted in the disease benign prostatic hypertrophy (BPH). DHT also affects the scalp where it causes hair loss as is seen in male pattern baldness. The enzyme that converts testosterone to DHT is called 5 alpha reductase. It has been targeted by medications like Proscar and Avodart to reverse prostate growth. On average, Proscar and Avodart reduce prostate size by 20 – 30 % and can greatly reduce urinary frequency and urgency in many men.

DHT levels are checked after starting testosterone replacement. If they are markedly elevated, drugs like these that inhibit the formation of DHT can be utilized to prevent urinary symptoms that are associated with BPH and an enlarged prostate.

DHEA is another hormone that has some similar effects as testosterone. The majority of this hormone is made in the adrenal glands and it also diminishes with aging and can be depleted by chronic stress. DHEA has been shown to protect against heart disease, osteoporosis, diabetes, cancer, memory loss, lupus, and rheumatoid arthritis. It can increase energy levels, libido, memory and immunity.

Replacement

Once the diagnosis of low testosterone has been made, replacement options can be reviewed and a decision made about how to raise testosterone levels. Unfortunately, oral testosterone replacement is not an option due to the breakdown by the liver when it is swallowed, which can cause liver toxicity. Other options include IM injections, patches, pharmaceutical gels, compounded creams, and implanted Testosterone pellets. Although they all will deliver testosterone to the body, they each have their own pros and cons that can be reviewed by your doctor.

In younger patients, a potential “kick start” may be needed to restart the body’s own natural testosterone production. This can be done with injections of the popular weight loss medication, which is also a natural hormone, HCG or the medication clomiphene.

After testosterone replacement has been started, it is very important to follow up and monitor testosterone levels as well as check other blood work to assure no possible complications arise. One such lab is PSA, which is used as a screening test for prostate cancer.

Although there is an association between prostate cancer and testosterone, it is an old belief that testosterone administration could increase the risk of developing prostate cancer. In reality, there is no evidence to support this and, in fact, the medical community is investigating an association between low testosterone levels and prostate cancer.

It is still believed that if there is active cancer of the prostate, whether localized or metastatic, testosterone can promote cancer growth. Therefore, the presence of active prostate cancer is a reason not to use supplemental testosterone.

PSA still needs to be monitored closely during testosterone replacement therapy, especially in someone with a family history of prostate cancer. In cases of localized prostate cancer years after successful treatment, with no evidence of active disease as noted by PSA and examination, it is very reasonable to initiate testosterone therapy as long as very close follow up is maintained.

Testosterone is a naturally occurring hormone. Replacement with its bioidentical form, can restore physiologic levels, and support a normal and happy sex life, as well as improve well-being, quality of life and enhance longevity.



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Dr. Yadven was born and raised in the Bronx, New York. He received his undergraduate degree from Emory University in Atlanta, Georgia and a Masters degree in Molecular Biology from George Washington University in Washington D.C. After college, Dr. Yadven worked as a marine biologist for the Smithsonian Institute in both Washington, D.C. and the Caribbean. He then received his Medical Degree and General Surgery training at George Washington University. Wanting to return to the South, Dr. Yadven completed his Urology Residency at Tulane University in New Orleans, Louisiana. He is

Board Certified by the American Board of Urology. Dr. Yadven has been in private practice in Bradenton, Florida since 1997 and is happy to call Florida his home.

Dr. Yadven practices all aspects of general Urology with particular interest in hormonal replacement and metabolism, prostate disease, urinary stone management and minimally invasive therapies. He has developed products for the management of urinary retention resulting in a U.S. patent.

In his free time, Dr. Yadven enjoys photography and digital art, NFL football (he is a huge New York Giants and New Orleans Saints fan), computers, water sports and fun at home with his wife Sharon, his two children Sarah and Maxwell and his family’s animal menagerie.



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