



## Accurate Clinic

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[www.AccurateClinic.com](http://www.AccurateClinic.com)

## Testosterone Assessment

### Low Testosterone

Low levels of testosterone have been implicated in many health problems including heart disease, diabetes, osteoporosis, high blood pressure and high cholesterol as well as erectile dysfunction and diminished sex drive. Having sub-optimal testosterone levels can also contribute to fatigue, weight gain and cognitive impairment. Maintaining normal testosterone levels is an important step you can take to maintain your health and possibly improve your sexual performance. If you're over 40, odds are you may already be starting to feel the debilitating effects of low testosterone. Research shows that by the time they are 60 years old, men typically produce 60% less testosterone than they did at age 20. *Other possible risk factors for having sub-optimal testosterone levels include frequent use of opiate pain medications, diabetes and being overweight.*

### Variables in the assessment of testosterone

Testosterone is present in two forms: bound and unbound (free). Most testosterone is bound to a protein (SHBG) in the blood and while bound it is not active. Only the unbound or free testosterone is active (bioavailable) and responsible for the benefits. One can have a normal total testosterone level (bound + free) but still have low free testosterone due to excessive binding of the testosterone, which can lead to symptoms. Estradiol, typically known as the female hormone, is also a normal hormone found in males and is the product of the metabolism of testosterone. When estradiol levels are excessively high, it may competitively compete with testosterone and contribute to symptoms of low testosterone.

Luteinizing hormone (LH) released from the brain stimulates testosterone production and is another variable affecting testosterone levels. It sometimes needs to be assessed as an unusual reason for low testosterone.

### How do you assess a man for testosterone insufficiency?

In the presence of symptoms or high suspicion for low testosterone, one initially obtains a screening blood test for total testosterone, to be drawn between 8am and 10am. If this level is optimal, no further tests need to be done. If the level is low, a repeat level is obtained to confirm that the first test was not just a transient situation.

If the screening test for total testosterone is low, it is important to confirm why it is low. If a patient is at risk for altered levels of the binding protein, SHBG, which might affect the total testosterone level, a free testosterone level is obtained. Conditions associated with alterations in SHBG include moderate-severe obesity, DM, and use of certain medications (prednisone, anticonvulsants). An LH level is obtained to aid in identifying either testicular dysfunction (LH should be high) or pituitary dysfunction (LH may be low or normal). A prolactin level is also obtained - if it is high it may predict a pituitary dysfunction.

If there is suspicion for possible pituitary abnormality, an MRI of the brain may be obtained.

### Treatment of low testosterone

Based on the results of the blood tests, treatment may be directed at a number of variables including reducing the protein binding of testosterone in order to raise free testosterone levels, reducing the conversion of testosterone to estradiol and/or providing testosterone replacement. Such treatments are individualized and may include prescription medications, dietary supplements, weight loss and exercise.

### Who is NOT a candidate for testosterone replacement?

Because prostate cancer grows more rapidly with testosterone, men with active prostate cancer should not receive testosterone. Screening for prostate cancer is required prior to starting testosterone treatment and includes obtaining a PSA blood test and performing a rectal exam of the prostate gland. Other conditions that may argue against testosterone replacement include sleep apnea, elevated red blood cell counts, and men attempting to father children.



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### Testosterone Replacement

Testosterone treatment is usually provided in the form of a topical cream or gel but may include injections, patches or testosterone pellet implants:

- *Topical testosterone* is preferred by most men. It requires daily application and care must be taken to avoid spreading the testosterone by
  - direct contact with the treated skin area to one's wife or children.
- *Testosterone patches* are convenient but frequently cause localized skin reactions.
- *Testosterone injections*, though preferred by some, may cause local reactions and sometimes lead to fluctuations in blood levels of testosterone between injections causing side effects (such as breast tenderness, fatigue or mood swings) or variations in benefits obtained.
- *Testosterone pellets* require a minor surgical procedure and may result in bleeding, infection or pellet extrusion at the implant site.

### Treatment Monitoring

After 3-6 months of treatment, PSA and total testosterone levels are obtained and then repeated at 6-12 month intervals thereafter.

#### TO SUMMARIZE THE WORK-UP:

1. Screening blood test (obtain in the morning): total testosterone (\$50)
2. If the screening test is low, a repeat screening of total testosterone and a PSA blood test (to screen for prostate cancer) is obtained.
3. Additional blood tests may be recommended including: a free testosterone, prolactin, LH and/or estradiol levels and possibly an MRI of the brain.
3. If testosterone levels are confirmed to be low *and* the decision is made to treat with testosterone replacement, a digital rectal exam is performed to screen for prostate cancer prior to starting treatment.