Low Testosterone

What is Low Testosterone?

Testosterone is the male sex hormone that is made in the testicles. Testosterone hormone levels are important to normal male sexual development and functions.

During puberty (in the teen years), testosterone helps boys develop male features like body and facial hair, deeper voice, and muscle strength. Men need testosterone to make sperm. Testosterone levels generally decrease with age, so older men tend to have low blood testosterone levels.

Some men have low testosterone levels. This is called Testosterone Deficiency Syndrome (TD) or Low Testosterone (Low-T). Deficiency means that the body does not have enough of a needed substance. Syndrome is a group of symptoms that, together, suggest a disease or health condition.

The American Urology Association (AUA) identifies low blood testosterone (Low-T) as less than 300 nanograms per deciliter (ng/dL). These symptoms or conditions may accompany Low-T:

- Low sex drive
- Fatigue
- Reduced lean muscle mass
- Irritability
- **Erectile dysfunction**
- Depression
- There are many other possible reasons for these symptoms, such as: opioid use, some congenital conditions (medical conditions you are born with), loss of or harm to the testicles, diabetes, and obesity (being overweight). See your doctor if you have any of these symptoms.

Why Testosterone Therapy (TT)?

You may need testosterone therapy (TT) if you have Low-T. Both the FDA and the AUA suggest that TT be used to treat conditions you are born with, such as Klinefelter syndrome.

You also may need TT if you harm or lose your testicles. If your testicles are removed because of a sickness such as cancer, you may need TT. Most men with Low-T (no matter what the cause) will be treated if they have both symptoms of Low-T and blood tests showing Low-T levels. Talk with your doctor if you feel that you may need TT.

TT may help you but it may have adverse (harmful) results. (See discussion of these side effects below.) The Federal Drug Administration (FDA) has said that testosterone drug labels should state that there is a risk for heart disease and stroke for some men using testosterone products. All men should be checked for heart disease and stroke before, and periodically while on, TT. The AUA however, on careful review of evidence-based peer review literature, has stated that there is no strong evidence that TT either increases or decreases the risk of cardiovascular events.

The FDA also was concerned when they found that men were being treated for Low-T due only to aging. There is ongoing research to determine more about TT in aging men. Your doctor will talk with you about the benefits and risks of TT and carefully consider how to treat your symptoms.

How Common is Low Testosterone in Men?

It is hard to know how many men among us have TD, although data suggest that overall about 2.1% (about 2 men in every 100) may have TD. As few as 1% of younger men may have TD, while as many as 50% of men over 80 years old may have TD. People who study the condition often use different cut-off points for the numbers, so you may hear different numbers being stated.

TD is more common in men who have diabetes or who are overweight. In one research study, 30% of overweight men had Low-T, compared to only 6.4% of those with normal weight. The same study found diabetes to be a risk factor for TD. In another study, 24.5% of men with diabetes had Low-T, compared to 12.6% of those without diabetes.

Symptoms

There are many signs and symptoms of Low Testosterone. Some are more closely related to Low-T levels (specific signs and symptoms). Others may not necessarily be linked (non-specific signs and symptoms). Your doctor will help you make sense of your own situation.

Specific Signs/Symptoms of Testosterone Deficiency (TD)

Specific symptoms are those more likely or directly linked to TD such as:

- Reduced sex drive
- Reduced erectile function
- Loss of body hair
- Less beard growth
- Loss of lean muscle mass
- Feeling very tired all the time (fatigue)
- Obesity (being overweight)
- Symptoms of depression

Non-specific Signs/Symptoms of Testosterone Deficiency (TD)

Non-specific symptoms are those that may or may not be linked to TD such as:

- Lower energy level, endurance and physical strength
- Poor memory
- Difficulty with finding words to say
- Poor focus
- Not doing well at work

Having any one of the specific or non-specific symptoms may not mean that you have TD. But if you have a mix of symptoms, for instance, if you start to feel very tired and sad over a period of time and this is a change for you, you may want to check for TD.

Low sexual desire alone may not mean that you have TD. But if you have a combination of low sexual desire, reduced erectile function, and feelings of sadness and tiredness, you should talk to your doctor.

Causes

Some persons are born with conditions that cause Testosterone Deficiency (TD) such as:

- Klinefelter syndrome
- Noonan syndrome
- Ambiguous genitalia (when the sex organs develop in ways that are not typical looking)

Some men may develop Low-T because of conditions like these:

- Damage to testicles by accident
- Removal of testicles because of cancer
- Chemotherapy or radiation
- Pituitary gland disease leading to hormone deficiency
- Infection

- Autoimmune disease (when the body makes antibodies that attack its own cells)

Basically, if your testicles keep making less testosterone than normal, your blood levels of testosterone will fall. Many men who develop TD have Low-T levels linked to:

- Aging
- Obesity
- Metabolic syndrome (high blood pressure, high blood sugar, unhealthy cholesterol levels, and belly fat)
- Use of medications such as antidepressants and narcotic pain medications

Men with certain health problems also tend to have low testosterone. Some of these are:

- HIV (about 30 out of 100 also have low testosterone)
- AIDS (about 50 out of 100 also have low testosterone)

Diagnosis

Although many symptoms may be tied to Low Testosterone (Low-T), total blood testosterone level is the most important measure of testosterone deficiency. To make a diagnosis, your doctor will use other specific signs and symptoms in addition to your testosterone blood level.

At your medical visit, your health history will be taken, and the doctor will do an exam and look for some of the signs and symptoms mentioned in this article.

Health History

Your doctor may ask you about:

- Headache, visual field change (possible symptoms of brain mass such as a pituitary tumor)
- How you developed at puberty
- History of head trauma
- Cranial (head) surgery/brain tumor or cranial irradiation
- Anosmia (loss of ability to smell)
- History of infection in your testicles
- Injury to your testicles
- Mumps after puberty
- Past or present use of anabolic steroids
- Use of opiates
- Use of glucocorticoids (medicines, such as cortisone, used to treat inflammation)
- History of chemotherapy or irradiation
- Family history of diseases linked to Low-T
- History of stroke or heart attack
- History of unexplained anemia

Physical Examination

Your doctor will check for the following:

- BMI or waist circumference for obesity
- Metabolic syndrome. These are symptoms (seen together) of increased blood pressure, high blood sugar, excess body fat around the waist, and abnormal cholesterol or triglyceride levels
- Hair pattern, amount, and location
- Gynecomastia (enlarged breasts)
- Whether testicles are present and their size
- Prostate size and any abnormalities

Testing

Your doctor may order these blood tests:

- **Total testosterone level.** This test should be done at two different times on samples taken before noon. Testosterone levels are lower later in the day. If you are ill, the doctor will wait until you are not sick because your illness may cause a false result.
- **Luteinizing hormone (LH).** This test is done to help find the cause of a Low-T level. This hormone controls how you make testosterone. Abnormal levels may mean a pituitary gland problem.
- **Blood prolactin level.** If your prolactin level is high, your doctor may repeat the blood test to make sure there is no error. High prolactin levels also may be a sign of pituitary problems or tumors.
- **Blood hemoglobin or Hgb.** Before doing this test, your doctor will look for other reasons for low Hgb such as climate level (like climate altitude), sleep apnea, or tobacco smoking.

The following also may be done to help with further diagnosis:

- **Follicle stimulating hormone (FSH).** This test is to check for sperm-making function if you want to have children. You may also need to have semen tests. These tests will be done before any hormone therapy.
- **Estradiol hormone** test is done if there are breast symptoms.
- **HbA1C** blood test may be done for diabetes.
- **MRI** (magnetic resonance imaging) of the pituitary gland
- **Bone density** tests.
- **Karyotype** (Chromosome tests).

You may hear about free testosterone or bioavailable tests for testosterone. These are not the same as total testosterone level tests. Ask your doctor about the differences and if you need these tests.

Treatment

In recent years, the media has reported more about Testosterone Therpy (TT), and more men between the ages of 40 and 64 have been tested and given TT. Some men with certain symptoms may even want TT without being tested. This action may not be safe or helpful for them. Total testosterone level should always be tested before any TT.

The AUA recommends that TT be prescribed only to men who meet the clinical and laboratory definition of testosterone deficiency (Testosterone level of less than 300 ng/dL). Here are some of the things you will need to know about TT:

- Your doctor will likely measure your testosterone level if you have these conditions:
  - Unexplained anemia
  - Diabetes
  - Bone density loss
  - Low-trauma bone fracture
  - Radiation to your testicles
  - HIV/AIDS positive test results
  - Chronic narcotic use
  - History of infertility
  - Pituitary gland disorders
- Even if you do not have specific signs and symptoms, your doctor may test your total testosterone level for these conditions:
  - Insulin resistance
  - History of chemotherapy
  - History of using corticosteroid medicines
- Health changes such as losing weight and getting more physical activity will likely raise your testosterone levels.
- Your doctor will want to check your hemoglobin/hematocrit (Hgb/Hct) levels while you are on TT. This blood test will help check for thickening of the blood.
- Blood thickening may cause blood clots. Your doctor may do Hgb/Hct levels two to six weeks after you start TT and every six to twelve months after that test.
- If you are at risk for heart disease, your doctor will follow you more closely when you are on TT. It also is important to make health changes to decrease the chances for heart and blood vessel disease.

- Your doctor will treat your Low-T level to raise it above 300ng/dl but the exact level may vary.
- Your doctor will watch you for signs and symptoms of improvement. Any changes will likely appear within three to six months of treatment.
- If your total testosterone blood level returns to normal and you still have symptoms, it is likely that there are other reasons for your symptoms. Your doctor may stop TT and try to find out what else might be the problem.

How Do I Take Testosterone?

There are generally five different ways to take testosterone. They are: transdermal (through the skin), injection, oral/buccal (by mouth), intranasal (through the nose), and by pellets under the skin. No method is better than another. While you are taking TT, your doctor will test your blood to determine testosterone levels.

Here are some details about the five different methods:

- **Transdermal** (Topical). There are topical gels, creams, liquids and patches. Topical medicines most often last for about four days. They absorb better if covered with an air- or water- tight dressing.
  - Apply liquids and gels, creams or patches to skin that is dry and without cuts or scratches.
  - Do not wash the area until it is time for the next dose.
  - Wash your hands after you apply liquids, gels or creams.
  - Make sure that other people, especially women and children, do not touch the medicines.

A topical patch is like a band-aid with medicine on it. You put it on and leave it until the next dose is due. The medicine on the patch is less likely than liquids, gels and creams to transfer to others.

- **Injection.** There are short-acting and long-acting forms of testosterone injection. The short-acting medicine may be given under the skin or in the muscle. The long-acting one is usually given in the muscle. Injections are usually given either weekly, every two weeks, or monthly.
- **Oral/buccal** (by mouth). The buccal dose comes in a patch that you place above your incisor (canine or "eyetooth"). The medication looks like a tablet but you should not chew or swallow it. The drug is released over 12 hours. This method has fewer harmful side effects on the liver than if the drug is swallowed, but it may cause headaches or cause irritation where you place it.
- **Intranasal.** This form of testosterone comes in a gel. You pump the dose into each nostril, as directed. It is usually taken three times daily.
- **Pellets.** Your doctor will place the testosterone pellets under the skin of your upper hip or buttocks. Your doctor will give a shot of local anesthesia to numb your skin, then make a small cut and place the pellets inside the fatty tissues underneath your skin. This medication dissolves slowly and is released over about 3-6 months, depending on the number of pellets.

You may want to choose how you take your testosterone based on what is best or most useful for you. In some cases, your insurance provider may decide the order in which testosterone therapies are provided. Talk about the choices with your doctor.

Are There Side Effects of TT?

There are some side effects of TT. Some side effects are mild while others are more serious. You should ask your doctor or pharmacist about these side effects and watch for them while you are taking TT. Some of the side effects are as follows:

- For gels and liquids, there may be some redness at the skin site. With patches, you may have itching and a rash around the area. A very small number of patients report back pain.
- For short-acting injections, you may have some reaction at the injection site. Some persons have had serious allergic reactions to the long-acting injection. Because of this, when you get the long-acting injection they will watch you closely for a while afterwards in the medical office.
- For testosterone pellets, possible adverse effects include swelling, pain, bruising and, rarely, hematoma (clotted blood under the skin).
- During TT, there is increased risk of erythrocytosis (abnormal raising of blood hemoglobin and hematocrit).
- TT may interrupt normal sperm production. You should not have TT if you plan on having children soon. If you are being treated for Low-T your doctor may suggest added treatment for sperm production.
- Topical testosterone, specifically gels, creams and liquids, may transfer to others. Women and children are most at risk of harmful effects from contact with them. You should take care to cover the area and wash your hands well after putting on the medication. Be careful not to let the site with the topical TT touch others because that could transfer the drug.
- The FDA suggests watching for signs and symptoms of early puberty in a child you live with or have contact with if you use topical testosterone. Do not let children touch the unwashed or unclothed area where you put the drug.

Here are some things you should know:

- There is no evidence linking TT to **prostate cancer**.
- There is no strong evidence linking TT to increase in vein clots.

- At this time, there is no strong evidence that TT either increases or decreases the risk of cardiovascular events. However, while you are on TT, you should call your doctor right away if you have signs or symptoms of stroke or heart attack.

After Treatment

Remember that each person is unique, and each body responds differently to treatment. TT may help erectile function, low sex drive, bone marrow density, anemia, lean body mass, and/or symptoms of depression. However, there is no strong evidence that TT will help memory recall, measures of diabetes, energy, tiredness, lipid profiles, or quality of life.

You will need routine checkups to see that your testosterone level stays normal. In patients who are stable on TT, total testosterone and certain other lab tests should be checked every 6-12 months.

If you are overweight, try to work on keeping your weight within recommended ranges. Increasing physical activity may help you lose weight and also may help increase testosterone levels.

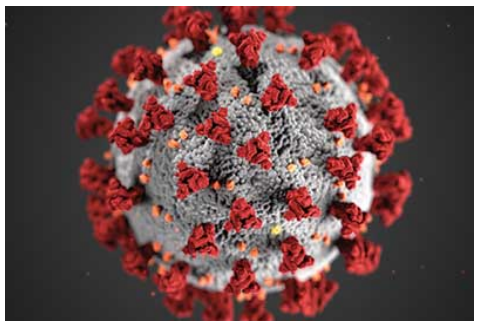
More Information

Some Questions You Might Ask Your Health Care Provider about Low Testosterone

When you go to see your doctor, you may be a bit nervous. It will help if you make a list of the most important things on your mind. Here are some ideas:

- What tests will I need to find out if I need **Testosterone Therapy** (TT)?
- Will I have to repeat these tests? If so, how often?
- Does a Low-T level make it hard for me to make sperm?
- Will TT help me to be more fertile?
- What methods of TT are there? Which one would you suggest for me? Why?
- I have diabetes. Does this mean I will need TT?
- I have trouble getting an erection. Will TT help with sexual function?
- During or after treatment, are there any changes I can make to my life and routine to help keep my testosterone level normal?
- My son was born with low testosterone. Will he need TT all his life?
- Are there support groups to help my son cope with his TD?
- Heart disease is in my family. Is it safe for me to have TT?

Explore Further



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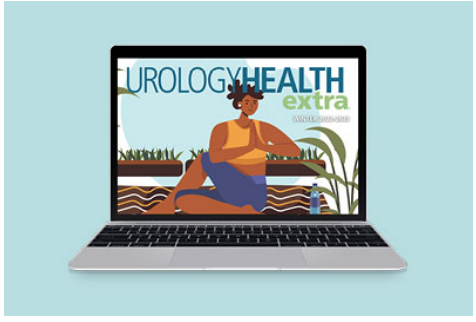

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