

NORTHWEST UROLOGICAL CLINIC, P.C.

Physicians and Surgeons

General Urology:

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Pediatric Urology:

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Testosterone Replacement

Low testosterone (low T) is a very common problem in men over 40, and sometimes even in men younger than 40. Men's testosterone levels usually peak in the early 20's, then decline about 1-2% per year after that. It affects more than 40% of men over 45. It can cause a number of symptoms and medical problems including low sex-drive, erectile dysfunction, decreased muscle mass and strength, osteoporosis (brittle bones), increased risk of heart disease, worsening of glucose control in diabetics, increased fatigue, worsening of cognition (brain power) and memory, and a decreased sense of well-being or moodiness. Replacing or supplementing testosterone can reverse these problems.

Measuring T levels:

Most of the testosterone in the bloodstream is bound to other molecules like sex-hormone binding globulin and albumin. T that is bound to these molecules cannot enter into cells where it has its effects. Only free T can enter cells and bind to the T receptors. Only about 1-2% of our total bloodstream T is free. This means that measuring total T is not very useful. What we really need is how much free T we have. It turns out this is very difficult to get an accurate measurement of free T. So instead, we measure total T and SHBG and use a special calculator to get a very close approximation of the free T. We find from studies that SHBG increases with age. Therefore, your free T will decline even if your T level were to remain the same. So if you were told you had a 'normal' or 'low normal' T level in the past, you may still have testosterone deficiency. Also, lab 'normal' levels typically are set by measuring T levels in large numbers of men of all ages. They do not screen out those men who are having symptoms of low T. This means men with low T get into the data that defines normal. So I don't rely on the printed lab 'normal' ranges. Testosterone levels can vary from day to day and week to week. In men under 40, T levels peak in the mornings and fall in the evenings. This daily fluctuation flattens out as we age, so morning T measurement is not needed in men over 40. Depending on how low your T is and what your age is, we sometimes like to confirm a low T level and may need to measure other hormones that affect T levels.

What are the risks of T replacement?

Our bodies have been exposed to testosterone all of our lives. The testosterone we use to boost your level is the same molecule you currently have in your body. The levels we want to achieve are similar to

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the levels you probably used to have in your 20's. So we would not expect too much in the way of side effects. There can be some, however. One is acne. When you go through puberty, you experience a large increase in T level, which can trigger increase in oil production in the skin. This may happen when you start T supplementation and trigger acne. This usually subsides once the T levels in your body have stabilized at the new higher level. Another possible side effect is mood changes. Most men report less irritability and an increased sense of wellbeing. However, some men report an increase in their emotions. Where they may never have been affected by a "tear jerker" movie, after T, they may notice they are more likely to become teary eyed. Some men report being more assertive after starting T. Anger issues are extremely uncommon in men on Testosterone replacement unless they are abusing it and achieving levels 3 or more times the normal levels. Some men report re-growth of hair they had lost on their arms, legs, and chest. Many men also report decrease in size of their testicles after several years of using T. Supplementing T frequently decreases a man's fertility. If you are thinking of having more children, you will need additional medications to prevent decrease in sperm production we see with T supplementation. That being said, don't count on T supplementation as a form of birth control!

What about testosterone and prostate cancer?

In the 1940's, pioneering researchers found that removal of testosterone in men with very advanced prostate cancer temporarily improved their symptoms of the cancer. This led them to declare that testosterone must cause prostate cancer or is 'fuel for the fire' in prostate cancer. This was based on observations in only 1 patient. Since then, it has been taught in medical training that T should not be used in men with prostate cancer or even for prostate enlargement. Since T was given this negative reputation, researchers have been trying to confirm that this was true. All of the scientific research done since then has failed to confirm a link between T and prostate cancer. Recent research has been done on men with prostate cancer on watchful waiting. These studies show that there was NO INCREASE of prostate cancer progression nor is there an increase in the aggressiveness (grade) of prostate cancer in these men. In studies conducted on men diagnosed with prostate cancer, those men with the LOWEST natural T levels tended to have the MOST AGGRESSIVE grades of prostate cancer. This is the opposite of what we would expect if T was stimulating prostate cancer cells. Also, T levels are at their highest levels from puberty through the 20's. Yet prostate cancer is uncommon in men under 50 and rare in men under 40. Despite this lack of scientific evidence that T causes or promotes prostate cancer, the FDA still requires T manufacturers to list warnings against using T in men with a diagnosis of prostate cancer. Be aware that using testosterone in men with prostate cancer is still controversial. Also, be aware that long-term studies on men on T for many years have yet to be done. So it is possible that longer-term studies may reveal additional risks.

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Cardiovascular Risks and Testosterone

In late 2013, an article published in the Journal of the American Medical Association (JAMA) claimed that there was an increase in risks of heart attacks, strokes, and cardiac death in men taking testosterone supplementation. In January of 2014, there was another article claiming increased heart risks in men on T as well. This led to a massive amount of news and TV spots in the risks of T supplementation in men. This scared many men away from taking testosterone and now we see law firms advertising for men on T who have had a heart attack. The scientific community was shocked that these articles showed harm for men on T because the medical literature for the last 30 years has shown that the cardiovascular effects of T in men is either neutral or slightly beneficial. These new articles did not fit with what most testosterone researchers and experts had observed in their practices. As it turns out, these 2 articles were severely flawed in their scientific methodology. In fact, the article in JAMA actually showed a risk of bad events of 10% in men ON testosterone and a 21% risk in men NOT TAKING testosterone! This is from data they published right out of their results page. Yet they used unproven statistical modeling to reverse the result and claim that men ON testosterone had a 25.7% risk and those NOT on T had only a 19.9% risk. There are numerous experts who have signed a petition to have these articles retracted because of their misleading conclusions and their unconventional handling of their data. Further research since these articles have again shown there is NO INCREASED RISK of heart attack, strokes, or cardiac death in men on testosterone supplementation. There is always room for more data and we welcome larger studies in men regarding all the potential risks of T supplementation.

What are the benefits of T replacement?

Most men report increased libido (sex drive). They also find that their ability to attain erections improves. The E.D. pills often work better after starting T and some men even start getting erections without the pills. Men also report the return of the morning erections they stopped having years ago. Many men report an increase in energy, strength, stamina, and physical performance. These men also have increased ability to lower body fat content and increase muscle mass. Men being treated for low T often report improved mood and sense of wellbeing. Some report increase memory and improved clarity of thought.

Studies show men being treated for low T have improvement in bone calcium content, which helps prevent osteoporosis. This decreases the likelihood of hip fractures later in life. Studies on T and heart disease indicate that men with low T are at increased risk for heart disease and heart attacks. Replacing T in these men significantly lowers their risk of these heart issues. Finally, diabetic men experience an improvement in control of their blood sugar with T replacement. They may find they need less diabetic

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medication to control their blood glucose once their T is back in the normal range.

How is Testosterone Delivered?

Unfortunately, T cannot be safely administered by taking a pill. Taking it by mouth causes liver damage. The liver also destroys much of the T taken by mouth. So T pills are not approved for use in the U.S. There are several other ways to get T into the body. They are T shots, topical T gels, implanted T pellets, T patches, and T tablets that stick to the gums.

Testosterone Injections: A needle is used to inject a T suspended in a viscous liquid into the muscle, usually the buttock or the thigh muscle. There may be some soreness at the injection site for a few days similar to a flu shot. The shot is given every 1 - 3 weeks. This method can lead to some fluctuations in T levels over the course of the shot interval. Most men on the 3-week shot regimen report feeling low the last week (lower libido, energy level, etc.). I usually recommend 200mg shot every 2 weeks. This is the least expensive form of T supplementation and will usually cost about \$80-100 for a 10 shot vial, which is used over the course of 4-5 months. The vials of T do not need to be refrigerated. The medical assistants in the office often give these shots. But we encourage men to learn to self-administer these shots at home.

Topical Testosterone: There are 4 different commercially available topical T products on the market. These are: Androgel, Testim, Axiron, and Fortesta. These are rubbed on to the skin once a day, usually after showering. You should leave it on for at least 4-6 hours. After that time, you have absorbed enough for the day and can shower or swim after that time. Androgel and Testim recommend placing the gel on the shoulders and chest. Axiron is applied to both axillae (arm-pits) AFTER applying any deodorant or antiperspirant. Fortesta recommends applying their gel to the inner thigh. Realistically, any of the gels can be applied to any part of the skin, except the penis and scrotum. I'll repeat this: **DO NOT APPLY THE TOPICAL TESTOSTERONE PRODUCTS TO THE PENIS AND SCROTUM.** The downside is that these gels are expensive if you don't have insurance coverage for them. They typically cost around \$250-300 a month. All of the manufacturers don't want cost to prevent a man from trying their gel, so they all offer some sort of voucher program to lower the out of pocket cost. These programs can get the cost down to \$25-40 per month. Another negative is that others who come into skin-to-skin contact with the user can absorb the topical T gels. This means you need to shower to wash off the gel if you are going to be in skin-to-skin contact with your spouse. You can also wear clothing to cover the area where you applied the gel to avoid transfer. Finally, there are some men whose skin doesn't absorb the topical T products well. We will see if you are absorbing the gel by seeing if your symptoms of low

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T improve and by testing your blood level after being on the T for 4-6 weeks. Some insurance companies cover the gels.

Implanted T pellets (Testopel): Testopel is a small pellet that contains testosterone. Usually, 8-12 pellets are implanted under the skin of the buttock or abdomen. Implantation involves a 15-20 minute procedure in the office. We use a large hollow needle to deliver these pellets under the skin after a local anesthetic and sterile skin prep. There is often some soreness at the implantation site for several days. The pellets dissolve completely over the next 4-6 months. Most men get the implants every 4 months. This maintains excellent levels of T over the time until the next implant. It is more expensive than T injections but less than 4 months of T gel. Insurance often will cover Testopel.

Testosterone Patch (Androderm): This is applied to the skin and is changed daily. It is about the 3 x 4 inches. It eliminates the concern for transferring the T to a spouse because the patch only releases T to the skin side. It is expensive like the gels. Many men complain of developing a rash or skin irritation at the site of the patches.

Buccal Testosterone Tablets (Striant): These are tablets that stick to the gums. They release the T through the gums into the bloodstream. It needs to be changed twice a day. It is expensive. It can cause significant gum irritation.

How long will I need to be on testosterone supplementation?

If your body is not producing enough T, you will need to remain on T supplementation until you no longer want it. If a man with hypertension stops his blood pressure medicine, his hypertension will return. The same is true for testosterone. If you stop T, your T level will drop to the previous level or even be lower, depending on how much time has passed since starting T. Remember, T levels drop about 1-2% per year on average. If you spent 5 years on T and then stopped, your level could be 5-10% lower than you when you started T.

If you have questions about testosterone, Dr. Myers will discuss this further at your next appointment.