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UROLOGY

Low Testosterone (Low T) & Testosterone Replacement Therapy (TRT)

Testosterone (T) is the male sex hormone and is made by the testicles. T levels are important to normal male sexual development in the adolescent and are essential for a variety of functions in the adult male. T levels generally decrease with age and having low levels of Testosterone is called Hypogonadism or Low Testosterone (Low T). The symptoms of Low T include low sex drive, low energy/fatigue, reduced muscle mass, irritability, depression, and mental fog.

The American Urology Association (AUA) recommends that Testosterone be prescribed only to men who meet the clinical and laboratory definition of Low T (Total Testosterone level less than 300 ng/dL). If your total testosterone levels return to normal and you still have above symptoms, there may be other reasons for your symptoms, and you should talk to your primary care doctor. While Low T levels *may* be involved with erectile dysfunction (ED), it's not typically the sole cause of ED. Contrary to commercials or ads you've seen, achieving a normal or high T level does not guarantee resolution of ED. As such, TRT is NOT an approved treatment for the correction of ED.

What labs should be checked? Total & Free Testosterone (should be documented as low at least twice), Luteinizing Hormone (LH), Follicle Stimulating Hormone (FSH), Estradiol, Prostate Specific Antigen (PSA), Sex Hormone Binding Globulin (SHBG), Prolactin, Hemoglobin/Hematocrit.

What are the ways to take Testosterone? There are few different ways to take Testosterone and no method is "the best".

- **Transdermal**. These are topical gels, creams, and patches that you apply daily.
- **Injections (Testosterone Cypionate)**. IM (intramuscular) injection into a muscle (typically the buttocks, *not the shoulder/thigh*). Injections are done either once a week or every two weeks by the patient themselves (we teach you).
- **Pellets.** Testosterone pellets are placed under the skin of upper hip or buttocks, and they release Testosterone over 3-6 months. *We do not prefer this method because of cost, challenges with insurance approval, and difficulty adjusting the Testosterone levels.*
- **Subcutaneous Injections (Testosterone Enanthate, "Xyosted").** Comes in a prefilled auto-injector that is self-injected into the belly skin.
- **Oral Testosterone Pills.** Jatenzo & Tlando. Insurance approval and cost is an issue because they are new and not generic.
- **Clomiphene ("Clomid").** An infertility med that causes the body to send signals to the testicles to produce more T. While it's being used more to treat Low T, it's still not FDA approved for this indication. Long term side effect profile is minimal (https://pubmed.ncbi.nlm.nih.gov/31216250/). This is a good option for younger men who want to preserve their fertility. T levels may not get as high with this method. ***There is NO generic version, your insurance may not cover it, and it can be expensive. You may need to shop around and/or consider Canadian discount pharmacies.*
- **Enclomiphene.** This is a component of Clomiphene that may be more potent and compounding pharmacies have been able to isolate and produce. Insurance companies will not cover Enclomiphene from compounding pharmacies; the pharmacy can provide pricing for you. We do **not** have any financial relationship or partnership with compounding pharmacies.
- **How can you naturally maximize your T levels?** Lose weight, prioritize protein (0.8 – 1.0 g / pound of body weight), strength/resistance training, get adequate sleep, limit alcohol, manage stress.
- The vast majority of "**Testosterone Boosters**" or over-the-counter supplements to help raise Testosterone are not effective. However, there is some promising info about:
    - **Ashwagandha (Withania somnifera)** has demonstrated some very mild increases in T (60 ng/dl). Common regimens include 200-300 mg twice daily (400-600 mg total daily dose) of standardized root extract.
    - **Tongkat Ali (Eurycoma longifolia)** - in young men (mean age 24), 600 mg/day for 2 weeks increased both Total and Free T levels. A study in older men found 200 mg/day for 1 month raised T levels. In older men (ages 57-72), 400 mg/day for 5 weeks increased Total and Free T.
    - **Boron –** In healthy men, 10 mg/day of boron for one week significantly reduced SHBG, thereby increasing Free T.

Possible Side Effects of TRT

- Erythrocytosis (elevated blood hemoglobin & hematocrit). This opposite of anemia. There is controversy whether this raises the risk of blood clots, heart attacks, strokes. Some patients may need to donate their blood to if their blood counts get too high while on TRT.
- Interrupt normal sperm production. You should not be on TRT if you plan on having children soon.
- Topical testosterone (gels, creams) may transfer to others. Women & children are at risk of harmful effects from skin contact.
- TRT *does not cause* prostate cancer, but someone with prostate cancer (or recently treated for prostate cancer) *should not go* on TRT.
- TRT may worsen urinary symptoms related to an enlarged prostate.
- Being on TRT may decrease your body's ability to make Testosterone on its own.
- Some patients may have an elevated Estradiol (estrogen) level while on TRT; this is because excess T in the body can be converted into Estradiol by an enzyme called aromatase. High Estradiol levels cause water retention, breast tenderness, decreased libido, and emotional changes. Some patients may need to take the aromatase inhibitor Anastrozole (Arimidex) 0.5mg twice a week to block this.

Testosterone IM (Intramusclar) Injection Instructions

Identify the syringe (1.5ml or 3ml syringe) and the "drawing" needle (18G x 1" needle or 20G x 1.5" needle) for removing the Testosterone from the vial. *This needle is not the needle you will be using to inject yourself.* (A separate 22G or 23G needle will be used for the actual Testosterone injection).

Wipe the top surface of the Testosterone vial with an alcohol pad.

Turn the vial of Testosterone upside down, hold near eye level, and insert the drawing needle (18G x 1" or 20G x 1.5" needle) on the syringe (1.5 ml or 3 ml syringe) into the vial. Prior to drawing out a liquid from a medication vial, you must push air into the vial to equalize the vacuum. Once the needle is in the vial, inject 1ml of air into the vial. Then draw out 1ml (or 0.5ml) of Testosterone liquid into the syringe.

Remove from vial and keep the needle pointing upwards to prevent spillage.

Carefully pull back the syringe plunger until Testosterone is cleared from needle and there is some air in the syringe.
Switch the needle on the syringe to the 22G or 23G needle to be used for injection.

While holding the syringe upward, gently advance the plunger until the air is removed and a single bead of liquid forms on tip of needle.

Clean the injection site (upper-outer buttock of buttocks) with an alcohol swab.

Push needle entirely and straight into injection site.

Using steady pressure, depress the plunger pushing all the Testosterone liquid into the muscle.

Remove needle and apply band aid if needed.

Standard Injection Protocols & Lab Work

- Most common injection protocols:
    - 1ml (200mg) IM (intramuscular) injection every 2 weeks
    - 0.5ml (100mg) IM (intramuscular) injection once a week
    - 0.25ml (50mg) SQ (subcutaneous) injection twice a week
- We require lab work every 3-6 months to check for side effects and to ensure your T levels stay in the correct range.
- Do **NOT** need to fast for these blood tests, but the timing of lab work in relation to when the T shots are done is **extremely** important:
    - If injecting every 2 weeks: Blood work should be done 1 week after an injection (*typically 1 week after the 5th shot*).
    - If injecting every 1 week: Blood work should be done 6 days after an injection (*typically 6 days after the 10th shot*).
    - In injecting twice a week: Blood work should be done the morning an injection is due, and before the shot is given.
    - This is timing is because if you check labs too soon after a T shot, the T levels in your blood will be measured as very high.
    - The Testosterone result can take 7 days to be resulted, so check your labs at least 1 week before your office appointment!!
    - Keep track of the dates you do your injections and blood work.