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Low Testosterone in Men

Drug company ads have greatly increased awareness of “low T” (male hypogonadism) over the past few years. More men are talking with their doctors about it. So doctors need to be knowledgeable about when and how to evaluate men for low T. This newsletter is designed to help.

Which men should be evaluated for low T?

The Endocrine Society says testing should be done for men who have symptoms.¹ Men without symptoms can be tested only if they have certain conditions in which low T is common.¹ Although frequency increases with age, age alone is not a criterion for testing.

What are the symptoms of low T?

Symptoms include:

- Decreased or no sex drive
- Poor morning erections
- Inability to get or keep an erection firm enough for intercourse (erectile dysfunction [ED])
- Loss of male sex characteristics
 - Loss of body hair
 - Small or shrinking testes
 - Decreased muscle mass and strength
- Low sperm count/infertility
- Increased body fat (BMI)
- Decreased energy and interest in doing things
- Depression
- Irritability
- Hot flashes
- Poor concentration and memory
- Sleep disturbances
- Breast discomfort and/or increased size
- Osteoporosis
- Decreased hemoglobin, mild anemia

Conditions in which low T is common

Low T is common in:

- HIV-related weight loss*
- Osteoporosis*
- Sellar mass, radiation, or disease*
- Treatment with medicines that affect testosterone (eg, glucocorticoids, opioids)*
- Chronic obstructive lung disease
- Diabetes, metabolic syndrome
- End-stage kidney disease
- Heart disease
- Infertility

*Men with these conditions may be tested even if they don't have symptoms.¹



Low testosterone is a common disorder.

The number of men with low T increases with age. But it's hard to know the overall prevalence. Different results have been obtained in different studies. The prevalence is higher in studies that defined low T based only on testosterone levels. It's lower when prevalence was based on low testosterone levels plus symptoms. If older patients are studied, prevalence will be higher than if younger patients are studied.

Here are results from a couple studies.^{2,3}

	Low T	Low T Plus Symptoms
Mulligan et al ^a	39%	—
Araujo et al ^b	24%	6%

^a Men over 45 year of age (mean 62 ± 11 years).

^b Men 30 to 79 years of age (mean 47 ± 12).

How to evaluate men for low T

Choose a testosterone test that is reliable and accurate. Many assays cannot accurately measure levels at the low end of normal. Accuracy requires extraction of the steroids from the specimen. It may also require chromatographic separation. This is not common in low-cost platform immunoassays. They often give falsely high results, particularly at lower concentrations.⁴ This makes it hard to interpret results that are close to the clinically important threshold (<300 ng/dL).⁴ The Endocrine Society favors extraction and chromatography followed by mass spectrometry, tandem mass spectrometry, or immunoassay.⁴

Total testosterone is the preferred test for the initial screening of patients. If the amount of testosterone is borderline between low and normal, measurements of free testosterone (by dialysis) or estimation of bioavailable testosterone should be used.^{1,4} This is especially true if you suspect a change in the major serum binding protein for testosterone, sex hormone binding globulin (SHBG).¹

Pulsatile secretion, diurnal variation, and illness may all affect the testosterone level. So collect blood as close to 7 to 8 AM as possible when the patient is not ill. And confirm low results before diagnosing low T.

If testosterone levels are low, you might want to do more tests to find out why. It could make a difference in how you treat the patient.

Tests may include¹:

- LH and FSH to differentiate primary and secondary disease
- Prolactin, iron saturation, and pituitary function tests to determine the cause of secondary disease
- Bone density test to assess fracture risk
- CT scan or MRI of the brain to look for tumor of the hypothalamus and pituitary
- Physical exam and genetic testing for Klinefelter syndrome

A digital rectal exam and a baseline PSA test should be done before prescribing treatment.¹ If abnormal, further evaluation should be done before treating the patient.¹

Monitoring testosterone therapy

The Endocrine Society recommends monitoring as follows¹:

- Total testosterone 3 to 6 months after starting therapy
- Hematocrit 3 to 6 months after starting therapy and annually thereafter (to detect erythrocytosis)
- Bone density after 1 to 2 years of therapy (just for men with osteoporosis or low-trauma fracture)
- DRE and PSA 3 to 6 months after starting therapy and then per screening guidelines

References

1. Bhasin S, Cunningham GR, Hayes FJ, et al. Testosterone therapy in adult men with androgen deficiency syndromes: an Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab.* 2010;95:2536-2559. endocrine.org/~/media/endosociety/Files/Publications/Clinical%20Practice%20Guidelines/FINAL-Androgens-in-Men-Standalone.pdf.
2. Mulligan T, Frick MF, Zuraw QC, et al. Prevalence of hypogonadism in males aged at least 45 years: the HIM Study. *Int J Clin Pract.* 2006;60:762-769.
3. Araujo AB, Esche GR, Kupelian V, et al. Prevalence of symptomatic androgen deficiency in men. *J Clin Endocrinol Metab.* 2007;92:4241-4247.
4. Rosner W, Auchus RJ, Azziz, R. Position statement: Utility, limitations, and pitfalls in measuring testosterone: an Endocrine Society Position Statement. *J Clin Endocrinol Metab.* 2007;92:405-413.