

Identifying and diagnosing **hypogonadism** in men

Evaluate testosterone deficiency with laboratory insights from Quest Diagnostics®

Symptoms and signs of hypogonadism in men¹

Specific symptoms^a

- Incomplete or delayed sexual development
- Loss of body hair
- Very small testes (<6 mL)

Suggestive symptoms and signs

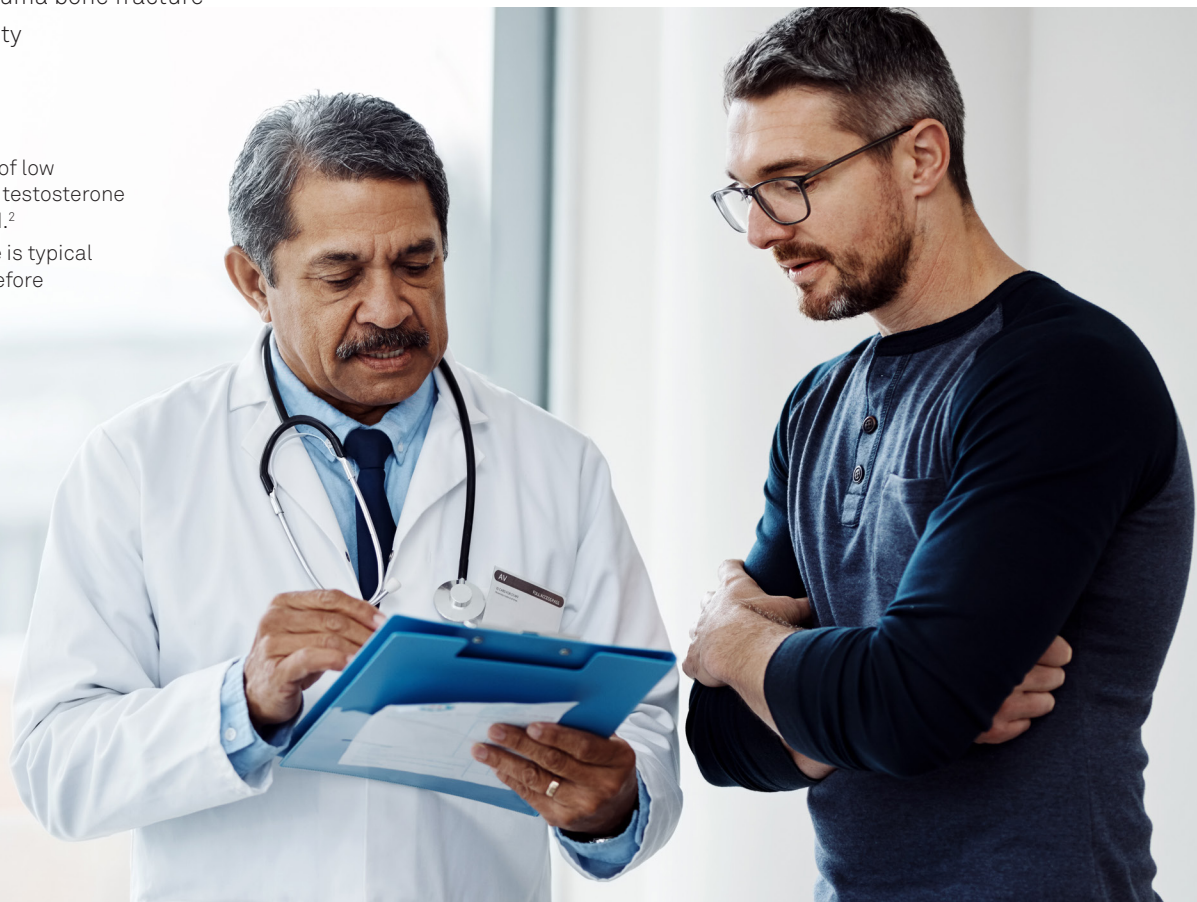
- Reduced libido^a
- Decreased spontaneous erections
- Erectile dysfunction^a
- Gynecomastia^a
- Eunuchoid body appearance^b
- Inability to conceive, low sperm count^a
- Height loss
- Osteoporosis or low-trauma bone fracture^a
- Low bone mineral density
- Hot flashes, sweats

Nonspecific symptoms and signs

- Decreased energy, motivation, initiative, self-confidence
- Depression
- Poor concentration and memory
- Sleep disturbances
- Mild unexplained anemia (normochromatic, normocytic)
- Reduced muscle bulk and strength
- Increased body fat, body mass index (BMI)

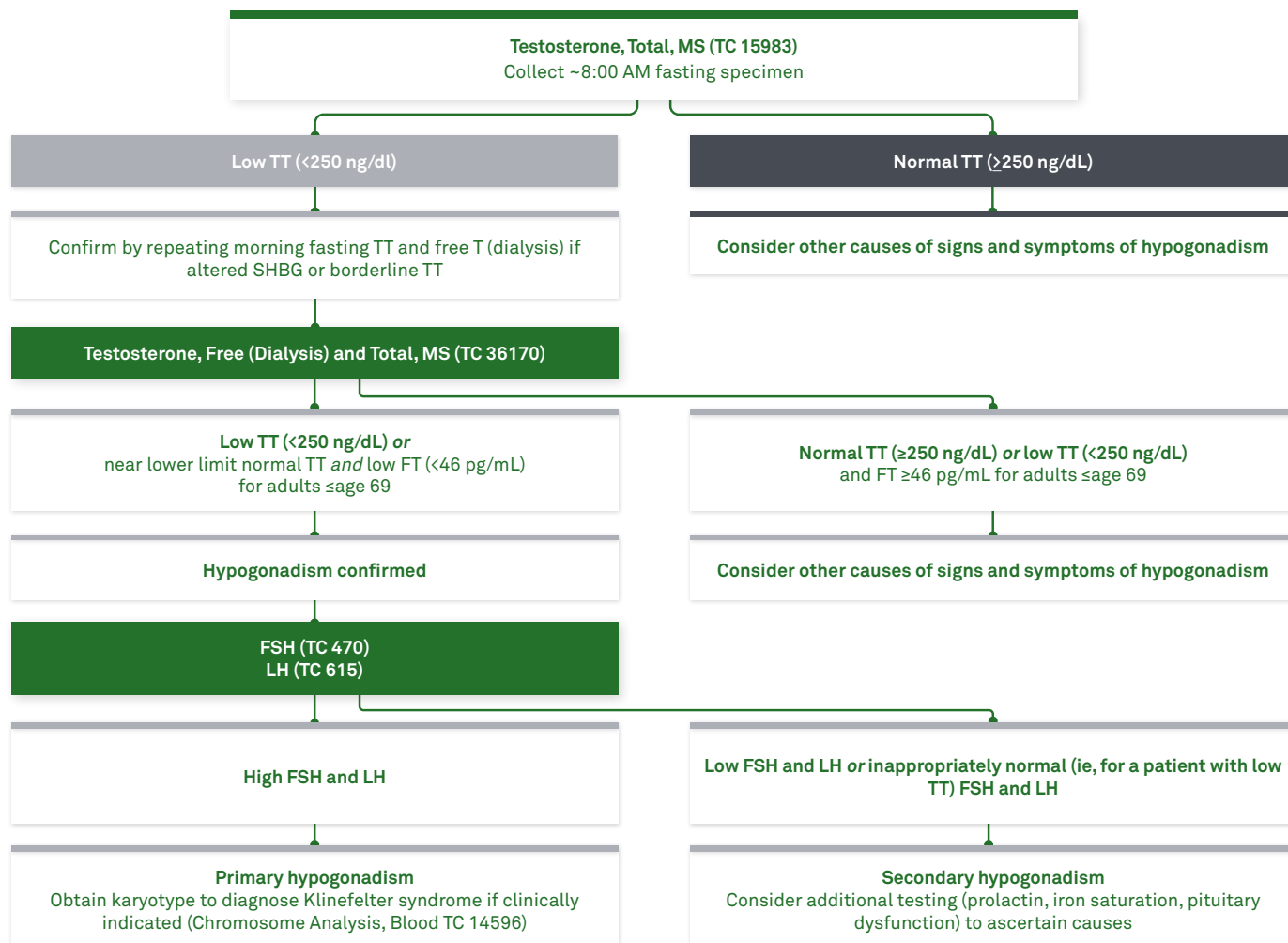
^a High-prevalence conditions of low testosterone for which serum testosterone measurements are suggested.²

^b Eunuchoid body appearance is typical of hypogonadism occurring before epiphyseal fusion.



Adult male hypogonadism diagnostic algorithm

For adult male patients with signs and symptoms of hypogonadism in the absence of conditions that alter sex hormone binding globulin (SHBG)



FSH, follicle-stimulating hormone; FT, free testosterone; LH, luteinizing hormone; SHBG, sex hormone binding globulin; TC, test code; TT, total testosterone.

This figure was developed by Quest Diagnostics based on reference 3. It is provided for informational purposes only and is not intended as medical advice. Test selection and interpretation, diagnosis, and patient management decisions should be based on the physician's education, clinical expertise, and assessment of the patient.

Get the answers you need with testing from Quest

Quest Diagnostics offers a comprehensive menu of laboratory insights that assists in diagnosing hypogonadism, distinguishing type and causes of hypogonadism, and monitoring and managing TRT.^{1,2,6}

Panel components may be ordered separately.

Available tests

Test code	Test name (component test codes for panels)	Clinical use
Diagnosis of hypogonadism (guideline-indicated, preferred)²		
36170	Testosterone, Free (Dialysis) and Total, MS ^{a,b}	Diagnose androgen deficiency when TT is near lower limit of normal or alteration in SHBG is suspected
15983	Testosterone, Total, MS ^{a,b}	Diagnose hypogonadism

Identifying type and cause of hypogonadism²

8658	Alpha Subunit	Identify cause of secondary hypogonadism; elevated in patients with hypogonadism associated with a nonfunctioning pituitary tumor
14596	Chromosome Analysis, Blood	Diagnose Klinefelter syndrome as an organic cause of primary hypogonadism
4212	Cortisol, A.M.	Evaluate pituitary hormones if there is a clinical indication of hypopituitarism on imaging
38149	Cortisol Response to ACTH Stimulation test	
470	Follicle-Stimulating Hormone (FSH)	Distinguish primary vs secondary hypogonadism
457	Ferritin	
5616	Iron, TIBC, and Ferritin Panel Includes iron, total (571), total iron binding capacity (7573), and ferritin (457).	Diagnose and identify iron overload syndrome (ie, iron saturation) as an organic cause of male hypogonadism
571	Iron, Total	
7573	Iron, Total and Total Iron Binding Capacity	
615	Luteinizing Hormone (LH)	Distinguish primary vs secondary hypogonadism
746	Prolactin	
40049	Prolactin, Dilution Study	Diagnose and identify hyperprolactinemia as a functional cause of male hypogonadism
16122	Prolactin, Total and Monomeric	
866	T4 Free (FT4)	
35167	T4 Free, Direct Dialysis	Evaluate hypothyroidism or hyperthyroidism, which are associated with changes in SHBG
899	Thyroid-Stimulating Hormone (TSH)	

Monitoring testosterone management^{2, 4, 5}

509	Hematocrit	
5363	PSA, Total	
15983	Testosterone, Total, MS ^{a, b}	

Other relevant tests

30740	Sex Hormone Binding Globulin (SHBG)	Assess whether FT measurements are needed for diagnosis; useful if an equation is used to calculate FT
30741	Testosterone, Free, Bioavailable and Total, Males (Adult), Immunoassay ^{b, d}	Monitor response to testosterone therapy once levels have normalized

ACTH, adrenocorticotropic hormone; FT, free testosterone; FT4, free thyroxine; LC/MS (LC-MS/MS), liquid chromatography/tandem mass spectrometry; MS, mass spectrometry; PSA, prostate-specific antigen; SHBG, sex hormone binding globulin; TRT, testosterone replacement therapy; TT, total testosterone.

^a This test was developed and its analytical performance characteristics have been determined by Quest Diagnostics. It has not been cleared or approved by the FDA. This assay has been validated pursuant to the CLIA regulations and is used for clinical purposes.

^b Laboratory tests can provide 3 measurements of testosterone: free, bioavailable, and total. These measurements incorporate the 3 major forms of circulating testosterone: unbound (free), weakly bound to albumin, and tightly bound to SHBG. TT is the total concentration of bioavailable (free and weakly bound testosterone) and SHBG-bound testosterone.

^c As an alternative to FT measurement by dialysis, FT levels can be estimated from a formula based on TT, SHBG, and albumin measurements (test code 14966)². Quest uses a modified Sodergard equation⁷ that accurately reflects FT as if it were measured by equilibrium dialysis²; however, FT measurement by dialysis is preferred (test code 36170).

^d Direct immunoassays cannot accurately measure low serum testosterone levels found in hypogonadal men. For higher specificity, sensitivity, and precision testing of low TT, clinicians should consider using LC-MS/MS-based assays, preferably those certified by the Centers for Disease Control and Prevention (CDC)². The LC-MS/MS tests (test codes 15983, 36170) have been certified by the CDC Hormone Standardization Program.⁴

For more information, visit [QuestDiagnostics.com/Hypogonadism](https://www.questdiagnostics.com/hypogonadism)

References

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