

Free and Bound T4



Does this test have other names?

Total T4 concentration, thyroxine screen, free T4 concentration, FT4

What is this test?

This test measures the level of the hormone thyroxine (T4) in your blood. The hormone is made by your thyroid gland. The thyroid is a butterfly-shaped gland near the base of your throat, above your collarbones.

The thyroid gland makes T4 in response to thyroid-stimulating hormone (TSH). TSH is made by the pituitary gland in your brain.

T4 is found in the body in 2 forms: free T4 and bound T4. Free T4 travels into body tissues that use T4. Bound T4 attaches to proteins that prevent it from entering these tissues. More than 99% of T4 is bound. Because T4 is converted into another thyroid hormone called T3 (triiodothyronine), free T4 is the more important hormone to measure. Any changes show up in T4 first.

T3 and T4 help to control how your body stores and uses energy to do its work (metabolism). The thyroid hormones also help control many of your body's other processes. These include:

- Breathing
- Heart function
- Nervous system function
- Body temperature
- Cholesterol level
- Weight gain
- Brain development
- Moisture in the skin
- Menstruation

This test can show your healthcare provider if your thyroid gland is overactive (hyperthyroidism) or underactive (hypothyroidism).

Why do I need this test?

You may need this test if you have symptoms of thyroid problems.

Symptoms of hyperthyroidism, or too much thyroid activity, include:

- Anxiety and mood swings
- Irritability
- Weakness in the arms and legs
- Sleeping problems
- Hand tremors

- Sweating
- Low tolerance for heat
- Irregular heartbeat
- Extreme tiredness
- Unexplained weight loss
- More frequent bowel movements than usual
- Eye irritation or bulging eyes (these are symptoms of Graves disease, a common cause of hyperthyroidism)
- Menstrual irregularity
- Enlarged breasts and erectile dysfunction in men
- Thinning of hair
- High blood sugar
- Shortness of breath
- More urination

Symptoms of hypothyroidism, or less than normal thyroid activity, include:

- Extreme tiredness
- Low tolerance for cold
- Weight gain
- Hair loss
- Swelling around the eyes
- Slower heart rate
- Shortness of breath
- Constipation
- Menstrual irregularity
- Loss of consciousness (rare)

What other tests might I have along with this test?

You may need other tests to measure thyroid-related substances. These include:

- TSH, T3, and free T3
- Imaging scans, such as ultrasound of the thyroid gland
- Radioactive iodine uptake scan of the thyroid (RAIU scan)
- Thyroglobulin, which is used to make and store thyroid hormones
- TSH receptor-stimulator antibodies, which are used to diagnose Graves disease

- Thyroid peroxidase antibodies and thyroglobulin antibodies, which are used to diagnose Hashimoto thyroiditis

What do my test results mean?

Test results may vary depending on your age, gender, health history, and other things. Your test results may be different depending on the lab used. They may not mean you have a problem. Ask your healthcare provider what your test results mean for you.

Results are given in micrograms per deciliter (mcg/dL). The normal range for total T4—both free and bound—varies by laboratory. But the usual range for total T4 in adults is 5.4 to 11.5 mcg/dL.

Free T4 is usually measured 2 ways:

- Free T4, with normal ranges determined by the testing method the lab uses
- Free T4 index, a formula that includes total T4 and a measurement called thyroid hormone-binding index. The normal range for the free T index is 4.8 to 12.7 mcg/dL.

If your results show high total T4 or a high free T4 index, it means you may have hyperthyroidism. If your results show low total T4 or a low free T4 index, it means you may have hypothyroidism.

Several other health conditions may cause high or low levels of T4.

How is this test done?

The test is done with a blood sample. A needle is used to draw blood from a vein in your arm or hand.

Does this test pose any risks?

Having a blood test with a needle carries some risks. These include bleeding, infection, bruising, and feeling lightheaded. When the needle pricks your arm or hand, you may feel a slight sting or pain. Afterward, the site may be sore.

What might affect my test results?

A number of medicines, such as estrogens, can affect your results. Being pregnant can also affect your results.

How do I get ready for this test?

You don't need to prepare for this test. But be sure your healthcare provider knows about all the medicines, herbs, vitamins, and supplements you are taking. This includes medicines that don't need a prescription and any illegal drugs you may use.

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