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Free T4 test

T4 (thyroxine) is the main hormone produced by the thyroid gland. A laboratory test can be done to measure the amount of free T4 in your blood. Free T4 is the thyroxine that is not attached to a protein in the blood.

How the Test is Performed

A blood sample is needed.

How to Prepare for the Test

Your health care provider will tell you if you need to stop taking any medicines that may affect the test result. In general, test results are not affected by other medicines you may be taking. However, certain supplements including biotin (vitamin B7) can affect the results. Tell your provider if you are taking biotin.

Pregnancy and some diseases, including kidney and liver disease, can also affect the results of this test.

How the Test will Feel

When the needle is inserted to draw blood, some people feel moderate pain. Others feel only a prick or stinging. Afterward, there may be some throbbing or a slight bruise. This soon goes away.

Why the Test is Performed

Your provider may recommend this test if you have signs of a thyroid disorder, including:

- Abnormal findings of other thyroid blood tests, such as TSH or T3
- Symptoms of an overactive thyroid
- Symptoms of an underactive thyroid
- Hypopituitarism -- when the pituitary gland does not produce enough of its hormones, including the hormone which stimulates the thyroid
- Lump or nodule in the thyroid
- Enlarged or irregular thyroid gland
- Problems becoming pregnant

This test is also used to monitor people who are being treated for thyroid problems.

Normal Results

A typical normal range is 0.8 to 1.9 nanograms per deciliter (ng/dL), or 10.3 to 24.5 picomoles per liter (pmol/L).

Normal value ranges may vary slightly among different laboratories. Some laboratories use different measurements or may test different specimens. Talk to your provider about the meaning of your specific test results.

The normal range is based on a large population and is not necessarily normal for an individual. You may be having symptoms of hyperthyroidism or hypothyroidism even though your free T4 is in the normal range. The TSH test may help determine if your symptoms are related to thyroid disease. Talk to your provider about your symptoms.

What Abnormal Results Mean

To fully understand results of the free T4 test, results of other thyroid blood tests, such as TSH or T3, may be needed.

Test results may also be affected by pregnancy, estrogen level, liver problems, more severe body-wide illnesses, and inherited changes in a protein that binds T4.

A higher than normal level of T4 may be due to conditions that involve an overactive thyroid, including:

- Graves disease
- Taking too much thyroid hormone medicine
- Thyroiditis
- Toxic goiter or toxic thyroid nodules
- Some tumors of the testes or ovaries (rare)
- Getting medical imaging tests with contrast dye that contains iodine (rare, and only if there is a problem with the thyroid)
- Eating a lot of foods that contain iodine (very rare, and only if there is a problem with the thyroid)

A lower than normal level of T4 may be due to:

- Hypothyroidism (including Hashimoto disease and other disorders involving an underactive thyroid)
- Severe acute illness
- Malnutrition or fasting
- Use of certain medicines

Risks

There is little risk involved with having your blood taken. Veins and arteries vary in size from one person to another and from one side of the body to the other. Obtaining a blood sample from some people may be more difficult than from others.

Other risks associated with having blood drawn are slight, but may include:

- Excessive bleeding

- Fainting or feeling lightheaded
- Multiple punctures to locate veins
- Hematoma (blood buildup under the skin)
- Infection (a slight risk any time the skin is broken)

Alternative Names

Free thyroxine test; Thyroxine test by equilibrium dialysis

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Review Date 2/28/2024

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Health Content
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06/01/2028

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