Thyroid Function Tests FAQ

WHAT IS THE THYROID GLAND?

The thyroid gland located in the neck produces thyroid hormones which help the body use energy, stay warm and keep the brain, heart, muscles, and other organs working normally.

1 OVERVIEW

HOW DOES THE THYROID GLAND FUNCTION?

The major thyroid hormone made by the thyroid gland is thyroxine, called T4. The thyroid makes a smaller amount of triiodothyronine (T3), but most of the body's T3 comes from conversion of T4 to T3 outside of the thyroid. The production of thyroid hormones is controlled by thyroid stimulating hormone (TSH), which is made in the pituitary gland near the brain. The pituitary is always measuring the amount of thyroid hormone and adjusts the amount of TSH in order to "talk" to the thyroid. If there is less T4, TSH will go up to tell the thyroid gland to produce more, and vice versa. By listening to each other, TSH and T4 keep each other balanced in a fairly narrow range.

WHAT BLOOD TESTS ARE THERE TO TEST IF THE THYROID IS WORKING?

TSH: Testing TSH is the best way to initially check thyroid function. A high TSH level indicates that the thyroid hormone level is low (usually *hypothyroidism*). A low TSH usually means that there is too much thyroid hormone. This happens when the thyroid is overactive (hyperthyroidism), but the most common reason is when someone is taking too much thyroid medication.

- T4: Tests of T4 are measuring the thyroid hormone itself. The most usual test is free T4 (FT4) because this measures the T4 hormone that is free to be used. FT4 is most useful to see the severity of a thyroid problem when TSH is abnormal. More rarely, an abnormal FT4 is necessary to diagnose problems of the pituitary gland.
- T3: T3 tests, either total T3 or free T3, can be useful to evaluate hyperthyroidism. However, T3 testing rarely is helpful in patients with hypothyroidism because TSH and FT4 will be abnormal earlier than T3. Reverse T3 is another form of thyroid hormone that is inactive, and measurement does not help determine whether hypothyroidism exists or not.

THYROGLOBULIN

Thyroglobulin (Tg) is a protein produced by normal thyroid cells and thyroid cancer cells. Tg is useful to monitor patients for recurrent thyroid cancer after their thyroid has been removed. Tg is not a primary measure of thyroid hormone function.

2 TESTS

WHAT ARE THYROID ANTIBODY TESTS FOR?

The immune system normally protects us from infection, but many thyroid problems are caused by the immune system reacting against the thyroid (autoimmune thyroid disease). Antibodies made by the immune system that target the thyroid can be measured and can be helpful tests. Anti-thyroid peroxidase antibody and anti-thyroglobulin antibody are frequently present in patients with *Hashimoto's thyroiditis* and indicate a higher risk of hypothyroidism if it is not present already. In patients with hyperthyroidism, measuring the presence of TSH receptor antibody (TSI or TRAb)min the blood helps diagnose *Graves' disease* as the cause.

ARE THERE MEDICATIONS THAT INTERFERE WITH THYROID FUNCTION TESTING?

Yes! There are many medications that may affect thyroid status. One important example is Biotin, which is a commonly taken over-the-counter supplement, and can cause thyroid function tests to appear to look abnormal when they are actually normal in the blood. Biotin should not be taken for 2 days before blood is drawn for thyroid function testing to avoid this effect.

WHAT OTHER TESTS OF THYROID FUNCTION EXIST?

RADIOACTIVE IODINE UPTAKE is a test that measures how much iodine the thyroid gland absorbs and can be useful in determining if the thyroid is overactive or underactive. It also can show which parts of the thyroid gland are functioning (the entire thyroid or only certain parts). This is most useful in evaluating patients with hyperthyroidism (see *hyperthyroidism brochure*).

FURTHER READING

Further details on this and other thyroid-related topics are available in the patient information section on the American Thyroid Association® website at *www.thyroid.org*.