

## **Thyroglobulin**

Thyroglobulin (Tg) is a protein produced by the normal thyroid gland. Tg is a prohormone, a precursor of thyroid hormones - triiodothyronine (T3) and thyroxine (T4). Tg level in blood is affected by iodide intake.

Tg is also produced by differentiated thyroid-cancer cells. It is produced during Graves disease and thyroiditis as well.

### **Why the Thyroglobulin Test is Performed?**

The Thyroglobulin test may be ordered to:

- Determine the cause of hyperthyroidism
- Determine the cause of hypothyroidism in infants
- Determine the effectiveness of treatment with anti-thyroid medications
- Monitor treatment of thyroid cancer (if it is producing Tg)
- Detect recurrence of thyroid cancer (if it is Tg producing)

### **How the Test is Performed and How to Prepare for the Test?**

A venous blood sample is needed. No test preparation is required.

### **What Abnormal Results Mean**

Normally, Tg levels are low in the serum of healthy people.

Tg levels may be increased due to:

- Differentiated (papillary and follicular) thyroid cancer
- Thyroid cancer metastases
- Hyperthyroidism
- Subacute thyroiditis
- Goiter
- Benign adenoma

Tg is only made by the thyroid gland (either normal thyroid tissue or cancerous thyroid tissue). So after thyroidectomy or radioactive iodine treatment, Tg levels should become undetectable. If Tg is still present in patients treated for thyroid cancer, this means that not

all the thyroid tissue (either normal or cancerous) has been removed and/or that the disease is recurring.

### **Alternative Names**

No alternative names.

### **Useful Information**

- Tg test alone is not enough to diagnose thyroid cancer and it is not recommended for use as a screening test.
- A single elevated Tg reading is not enough to suggest a recurrence of cancer; changes in the Tg concentrations over time provides more important information. Serial Tg testing should be performed at the same laboratory, since test methods may produce different results in different laboratories.
- 15-20% of thyroid cancer patients develop thyroglobulin antibodies (TgAb). These antibodies interfere with the measurement of Tg. They cause falsely elevated or decreased values, thus eliminating the usefulness of the Tg test. For this reason, TgAb tests are also recommended along with the Tg test.
- After complete removal of the thyroid gland, patients need to take thyroid hormone replacement – L-thyroxine. In the past, patients had to stop taking thyroxine several weeks before the Tg test. This stimulated TSH and Tg production, which made the Tg test more sensitive. However, withdrawing from thyroxine caused uncomfortable symptoms of hypothyroidism. Nowadays, a recombinant form of TSH is available and it can directly stimulate thyroglobulin production. Patients do not have to stop taking thyroxine any more and this allows them to have a stimulated Tg test without any unpleasant side-effects.