

Understand Your Blood Test Results

For patients who have a differentiated thyroid cancer

- **Papillary**
- **Follicular**
- **Papillary or follicular**

Read this brochure to learn about:

- the different parts of your blood
- how to understand your blood test results
- where to get more details about your blood test results



What is a blood test?

A blood test is a test of your blood using a needle in your arm. Blood tests are done to see how healthy you are. During your treatment for thyroid cancer, your doctor will arrange for you to do blood tests.



For patients who have thyroid cancer, blood tests help to:

- monitor the thyroid cancer and normal thyroid tissue
- make sure you get the right amount of thyroid hormone
- can measure the amount of normal thyroid tissue or thyroid tumour (cancer)

Read below to learn about the different parts of your blood.

What is Thyroglobulin (Tg)?

Thyroglobulin (Tg) (pronounced thy-ro-glob-u-lin) is a protein that can be measured in your blood.

Thyroglobulin is made by normal thyroid cells, and made by most thyroid cancer cells. For example, for patients with papillary or follicular thyroid cancer, nearly all cancer cells make thyroglobulin. Patients with medullary or anaplastic thyroid cancer will not make any thyroglobulin.

Why is my Thyroglobulin tested?

If patients have surgery to remove their thyroid, the level of thyroglobulin in their blood can be used to check whether there is any tumour (cancer) left behind, or if some of the thyroid remains.

Having thyroglobulin in your blood can mean that part of the tumour (cancer), or part of the normal thyroid, remains.

What is Thyroid Stimulating Hormone (TSH)?

Thyroid Stimulating Hormone (TSH) is a hormone that can be measured in your blood. TSH is made by the pituitary gland (pea-sized gland in the center of your skull).

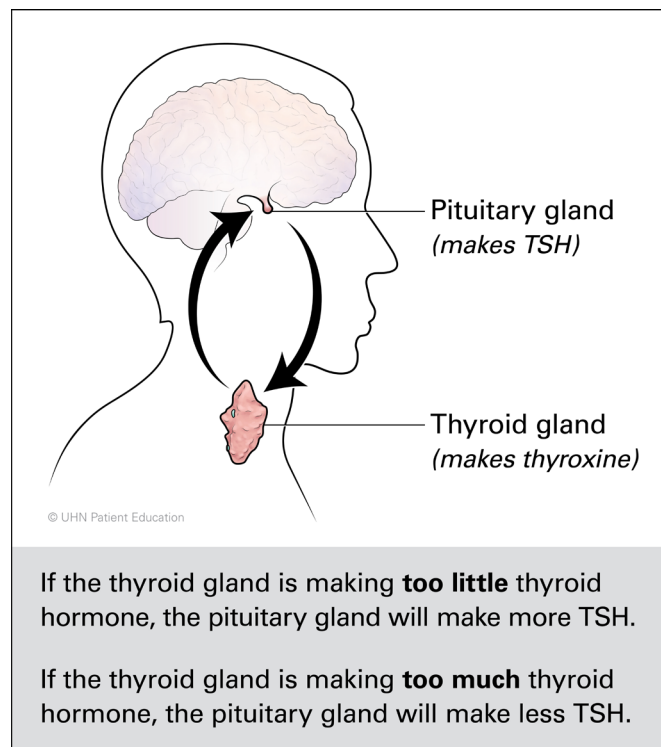
The thyroid makes the hormone “thyroxine”. Thyroxine helps control your metabolism (this includes your growth and heart function), and can affect your mood, and sexual function.

If the thyroid gland (small, butterfly-shaped gland in your neck) is making too little thyroid hormone, the pituitary gland will make more TSH.

If you have too little thyroid tissue or no thyroid tissue, your doctor will give you thyroid hormone replacement (synthroid or L-thyroxine). Thyroid hormone replacement is taken as a pill, and it replaces the thyroxine your body is no longer making.

If the thyroid gland is making too much thyroid hormone, the pituitary gland will make less TSH.

More TSH helps the thyroid to make more thyroid hormone and also thyroglobulin. If your TSH is too high, it may cause any thyroid cancer cells you may have to grow.



What are Thyroglobulin Antibodies (TgAb)?

Thyroglobulin antibodies (TgAb) are proteins that can be measured in your blood. Thyroglobulin antibodies are made by your immune system. They are often used by your immune system to find and fight foreign proteins (proteins not normally found in your body).

Most of the time, a healthy immune system would not make a lot of antibodies to fight thyroglobulin, since thyroglobulin is not a foreign protein. But, some patients with thyroid cancer will make thyroglobulin antibodies. This can interfere with thyroglobulin tests and cause a false (often low) thyroglobulin level in your blood.

What are the normal ranges for my blood test?

Thyroglobulin, TSH, and thyroglobulin antibodies levels are often measured and looked at together. Each blood lab may have different ranges for a normal level.

At the Princess Margaret Cancer Centre and other University Health Network (UHN) blood labs, the normal ranges are:

- **Thyroglobulin (Tg):** If the thyroid gland has been removed, the normal range is equal to, or less than 5 Micrograms per Litre (ug/L)
- **Thyroid Stimulating Hormone (TSH):** Normal range is 0.35 – 4.94 Milli-International Units per Litre (mIU/L)
- **Thyroglobulin Antibodies (TgAb):** Normal range is equal to, or less than 114 International Units per Milliliter (IU/ml)

Understand your Thyroglobulin

It is important to look at your thyroglobulin level with your TSH, as a high TSH forces thyroid tissue to make more thyroglobulin. This raises your thyroglobulin level.

Below are some important details to keep in mind when reading your blood test results.

- If your thyroglobulin range is “undetectable” (at UHN this means it is less than 0.9 Micrograms per Litre (ug/L) or below 5ug/L, and your thyroglobulin antibodies are normal, there is likely no normal thyroid tissue and no cancerous tissue found.
- If your thyroglobulin range is “detectable” (this means it is – 5 ug/L or above), there is likely some normal thyroid tissue or cancerous tissue found.
- If your thyroglobulin range rises with time, and your TSH does not rise, there is likely some thyroid cancer which is growing.
- If your thyroglobulin range falls with time, and your TSH does not also fall, there is likely thyroid cancer which is responding to treatment.

Know what a high TSH means for your health

Your TSH may be high because:

- Your thyroid hormone replacement dose (synthyroid, L-thyroxine) is not enough,
- Your thyroid hormone replacement has been stopped, or
- You have been given thyrogen injection to stimulate your TSH.

If your TSH is high and your thyroglobulin is “undetectable” or below 5 ug/L, and your thyroglobulin antibodies are normal, this likely means there is no normal thyroid tissue or cancerous tissue found.

Know about your TSH level

The dose of your thyroid hormone replacement will be changed so that your TSH is at a level that your doctor thinks is right for you.

Below is a list of TSH levels, and what they mean for your health:

- **Normal range:** 0.35 – 4.94 Milli-International Units per Litre (mIU/L)
- **Lower range of normal:** 0.35 – 2 mIU/L
- **Below normal:** 0.05 – 0.35 mIU/L
- **Undetectable:** This means it is less than 0.05 mIU/ml

If your TSH is above normal, or sometimes at the higher end of normal, your doctor may suggest that your dose of thyroxine be raised. This is done to bring your TSH level down to either undetectable, below normal, or in the lower range of normal. The level your doctor recommends will depend on your case.

T3 and T4

- **T3 Normal range:** 2.6-5.7 pmol/L
- **T4 Normal range:** 9-19 pmol/L

These are measurements of thyroid hormone level. T4 is sometimes slightly high when your TSH level is below normal, but that is acceptable as long as you do not have any symptoms of high thyroid hormone levels such as increased anxiety or palpitations (feeling your heart is pounding or racing).

Thyroglobulin Antibodies (TgAb)

Although thyroglobulin antibodies interfere with the measure of thyroglobulin, the trend in thyroglobulin antibodies over time may let your health care team know how well your treatment is working.



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