



Second Year Medicine

## Endocrine System Part 3

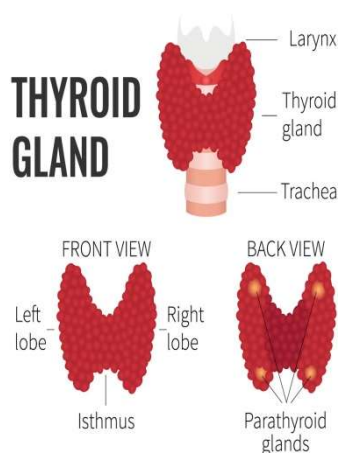
### Thyroid Gland

What is a thyroid gland?

The thyroid gland is an endocrine gland in your neck. It makes two hormones that are secreted into the blood: thyroxine (T4) and triiodothyronine (T3). These hormones are necessary for all the cells in your body to work normally, they play an important role in regulation of your weight, energy levels, internal temperature, skin, hair, nail growth, metabolism and is an important part of the endocrine system.

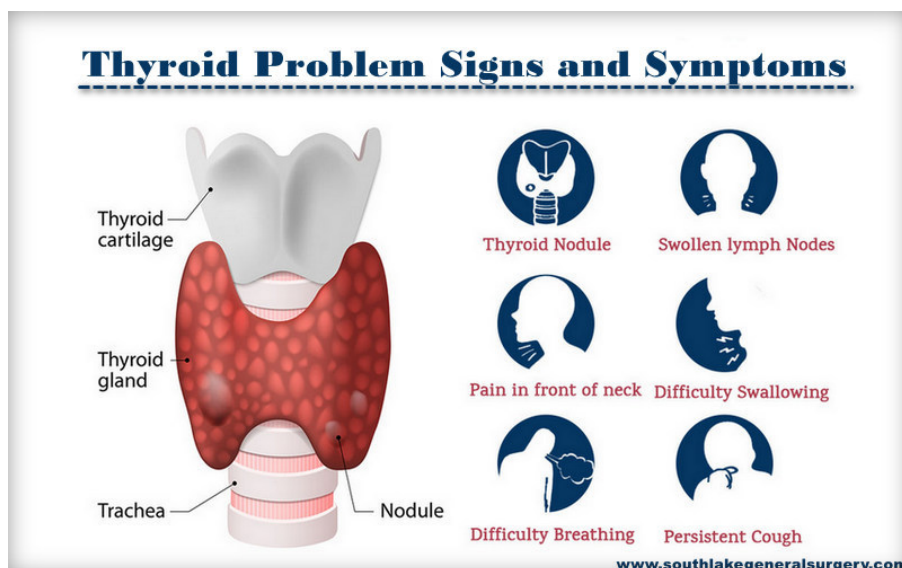
The thyroid gland is shaped like a butterfly, and is located low on the front side of the neck. It is below Adam's apple, along the front of the windpipe. There are two side lobes in the thyroid, and they are connected by a bridge (isthmus) in the middle. We usually cannot feel our thyroid when it is in its normal size.

The thyroid is richly supplied with blood vessels, and is brownish-red in colour. Certain nerves that are important for our voice quality also pass through the thyroid. Several hormones, collectively called thyroid hormones, are secreted by the thyroid. Thyroxine, also called T4, is the main hormone. Metabolism, growth and development, and body temperature are all influenced by thyroid hormones. Adequate thyroid hormone is essential for brain development during infancy and childhood.



## Thyroid diseases

- A. **Goiter:** Swelling of the thyroid is termed Goiter. This can be harmless or may indicate iodine deficiency or a condition called Hashimoto's thyroiditis, which is associated with thyroid inflammation
- B. **Thyroiditis:** A viral infection or autoimmune condition can result in inflammation of the thyroid called Thyroiditis, which can be painful, or be completely asymptomatic
- C. **Hyperthyroidism:** This is usually caused by Graves' disease or an overactive thyroid nodule, and results in excessive thyroid hormone production
- D. **Hypothyroidism:** Low production of thyroid hormone is Hypothyroidism. The most common cause of hypothyroidism is thyroid malfunction caused by autoimmune disease
- E. **Graves' disease:** Overstimulation of the thyroid due to an autoimmune condition, causing hyperthyroidism, is called Graves' disease
- F. **Thyroid cancer:** Though it is an uncommon form of cancer, thyroid cancer is usually curable. Treatment options are surgery, radiation, and hormone treatments
- G. **Thyroid nodule:** These are very common and refer to small abnormal mass or lump in the thyroid gland. Few can be cancerous. They may either secrete excess hormones, causing hyperthyroidism, or cause no trouble at all
- H. **Thyroid storm:** This is a rare form of hyperthyroidism where extremely high levels of thyroid hormone cause severe illness



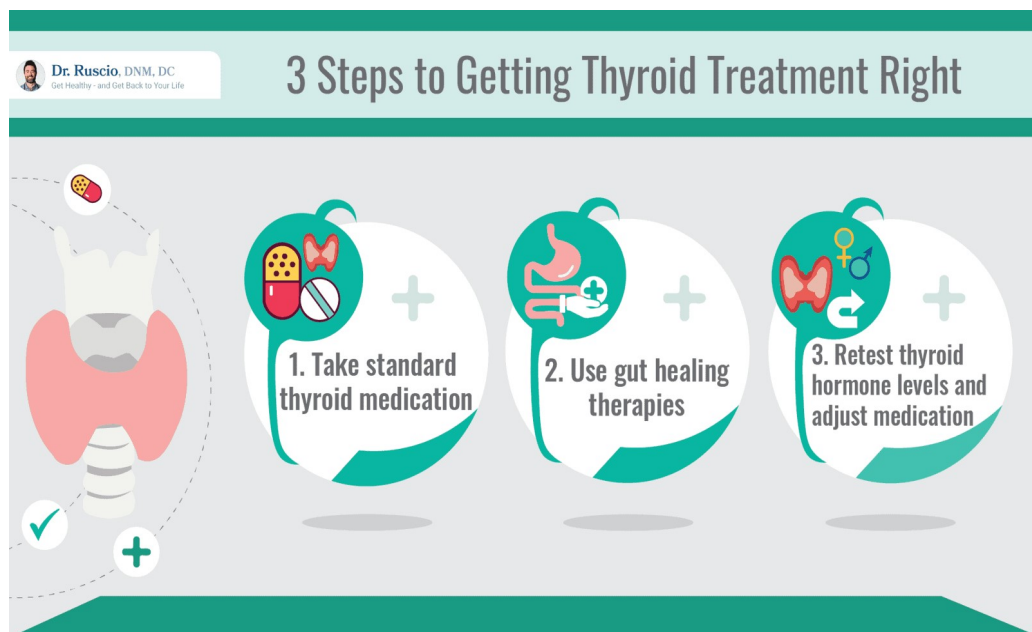
## Thyroid Tests

- 1) **Anti-TPO antibodies:** Sometimes, proteins mistakenly attack the thyroid peroxidase enzyme, which is used by the thyroid to make thyroid hormones. This is called the autoimmune thyroid disease.
- 2) **Thyroid ultrasound:** When a probe is placed on the skin of the neck, the reflected sound waves can identify abnormal areas of thyroid tissue
- 3) **Thyroid scan:** In this test, a small amount of radioactive iodine is administered through the mouth to get thyroid gland images
- 4) **Thyroid biopsy:** A small amount of thyroid tissue is removed with a needle, and tests are done, in order to look for thyroid cancer
- 5) **Thyroid stimulating hormone (TSH):** TSH is secreted by the brain, and regulates the release of thyroid hormone. High TSH found in a blood sample indicates low levels of thyroid hormone (hypothyroidism), and low TSH suggests hyperthyroidism
- 6) **T3 and T4 (thyroxine):** These are the primary forms of thyroid hormone, and the levels can be checked with a blood test
- 7) **Thyroglobulins:** The thyroid secretes this substance and it can be used as a marker of thyroid cancer. It is usually checked in follow-up in patients with a history of thyroid cancer. High levels of Thyroglobulins indicate recurrence of the cancer
- 8) **Other imaging tests:** If tests indicate that thyroid cancer has spread (metastasized), further investigations like CT, MRI, or PET scans can help identify the extent of spread

Thyroid Test Results Chart			
<i>T3</i>	<i>T4</i>	<i>TSH</i>	<i>TYPE OF THYROID</i>
Normal	Normal	High (↑)	Primary Hypothyroidism
Low (↓)	Low (↓)	High (↑)	Hypothyroidism
Normal	Normal	Low (↓)	Primary Hyperthyroidism
High (↑)	High (↑)	Low (↓)	Hyperthyroidism
Low (↓)	Low (↓)	Low (↓)	Pituitary gland Abnormal

## Thyroid Treatments

- A. Thyroid surgery (thyroidectomy): Thyroidectomy is carried out for thyroid cancer, goiter, or hyperthyroidism, where surgery removes all or part of the thyroid
- B. Antithyroid medications: The overproduction of thyroid hormones (hyperthyroidism) can be slowed down through medications
- C. Radioactive iodine: This can be used in low doses for testing the thyroid gland or destroying an overactive gland. Cancerous tissue can be destroyed if large doses are used
- D. External radiation: Over many appointments, a beam of radiation is directed at the thyroid, and these high-energy rays help kill cancerous cells in the thyroid
- E. Thyroid hormone pills: This daily treatment in the form of thyroid hormone pills, helps to replace the amount of thyroid hormone one is unable to make. The pills treat hypothyroidism, and also help prevent thyroid cancer from coming back after treatment



### References:

[southlakegeneralsurgery.com/know-more-about-thyroid-treatment-and-surgery](https://southlakegeneralsurgery.com/know-more-about-thyroid-treatment-and-surgery)

searchThyroid Treatments

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