

# Thyroid Gland



**Patient Information**

## Contact details for Endocrine and Thyroid Clinics

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**Your Endocrine Specialist Doctor is** .....

**Your Endocrine/Thyroid Nurse is** .....

**Your GP is** .....

## Reference websites for more information

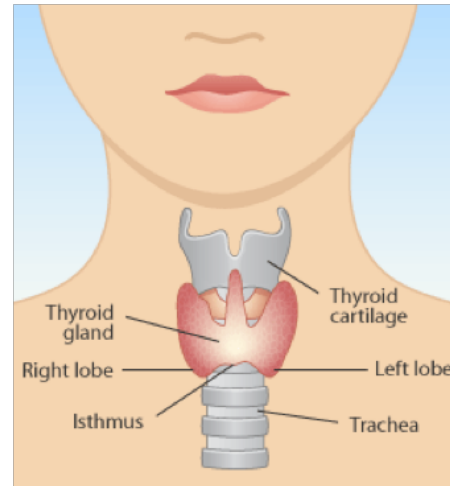
- [www.thyroid.org](http://www.thyroid.org)
- [www.hormone.org](http://www.hormone.org)

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## What is the thyroid gland?

The thyroid gland is a small butterfly shaped endocrine gland located in the base of the neck, at the front and just below the voice box. The thyroid gland produces thyroid hormones; thyroxine (**T4**) and triiodothyronine (**T3**) which travel around the body and regulate how the body uses energy (metabolism) to control body functions.



## How your thyroid works

Thyroid hormones affect how the body functions and controls the brain, heart, muscles, intestines and temperature regulation. When the thyroid gland is not working normally, this can influence moods, concentration, sleep, restlessness, memory, weight, eyes, skin and hair.

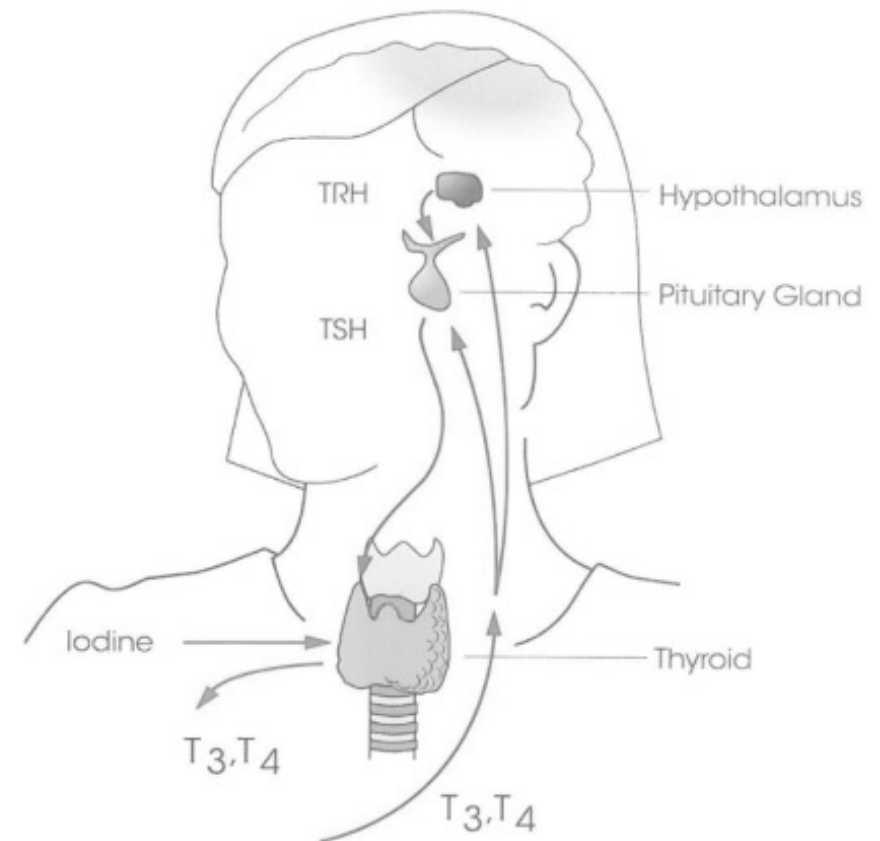
The thyroid gland is controlled by the pituitary gland, located in the brain. The pituitary gland produces thyroid stimulating hormone (**TSH**) which checks how much **T3** and **T4** is in the blood and signals the thyroid gland to make more or less thyroid hormones.

**TSH** - is an accurate indicator of how the thyroid is working. A high level indicates the thyroid is not producing enough thyroid hormone (**hypothyroidism**). A low level of TSH indicates the thyroid is producing too much thyroid hormone (**hyperthyroidism**).

**T4** (Thyroxine) – The thyroid needs iodine to make thyroid hormones and gets this from food. It is not usually necessary to take extra supplements of iodine unless there is iodine deficiency or during pregnancy. Thyroxine is stored in the thyroid gland for the body to use over several weeks so is not usually affected by day-to-day fluctuations of iodine in the diet. T4 is converted to T3 for use in the body cells.

**T3** – T3 is used by the cells for metabolism (energy use) and body functions. Measuring T3 levels is useful for diagnosis and determining the cause of hyperthyroidism.

## Thyroid Hormone Function Diagram (Sanofi Aventis)



## What is Hyperthyroidism?

Hyperthyroidism is where the thyroid gland is overactive and produces too much thyroxine, causing metabolism to run too quickly. A blood test would show high T4 and low TSH levels.

Hyperthyroidism is known by many names (which describe the cause of your thyroid problem) including thyrotoxicosis, toxic goitre, Graves' disease, Hashimoto thyroiditis or hot nodule.

If left untreated, hyperthyroidism can cause other serious health problems, including a fast or irregular heart beat, heart failure, muscle weakness and the bones become weaker (osteoporosis).

**Signs and symptoms** – the effects of hyperthyroidism range from mild to severe. You may experience minimal symptoms or have several from the list below which affect your day-to-day life:

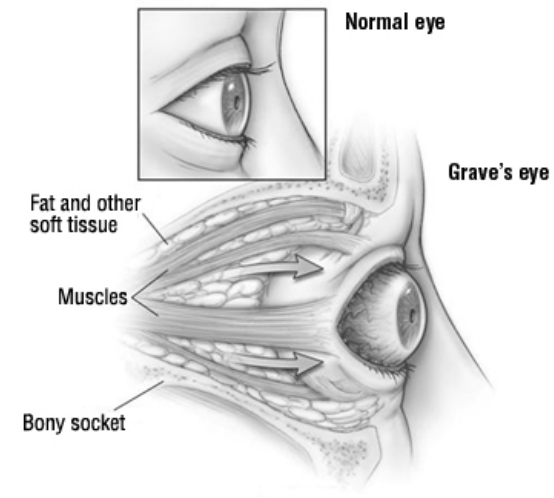
- feeling too hot and/or increased sweating
- flushed skin
- pounding or fast heart beat, tiredness/fatigue
- anxiety
- increased appetite
- weight loss
- diarrhoea
- muscle weakness
- trembling hands
- irritability
- personality changes
- restlessness
- poor sleep
- dry, brittle hair
- breathing problems
- eye problems
- osteoporosis
- high blood pressure
- goitre (see page 8)
- menstrual irregularities
- erectile dysfunction
- infertility

## Graves' disease

Graves' disease is the most common cause of overactive thyroid disease. This is when the autoimmune system stimulates the thyroid gland and causes it to make too much thyroid hormone. This generally affects the whole gland.

### Graves' eye disease (Ophthalmopathy)

In a few cases of Graves' disease the eyes are affected. The immune system causes inflammation of the muscles and fat behind the eyes which then pushes the eyes forward, out from the eye socket. Graves' eye disease is not associated with other thyroid conditions.

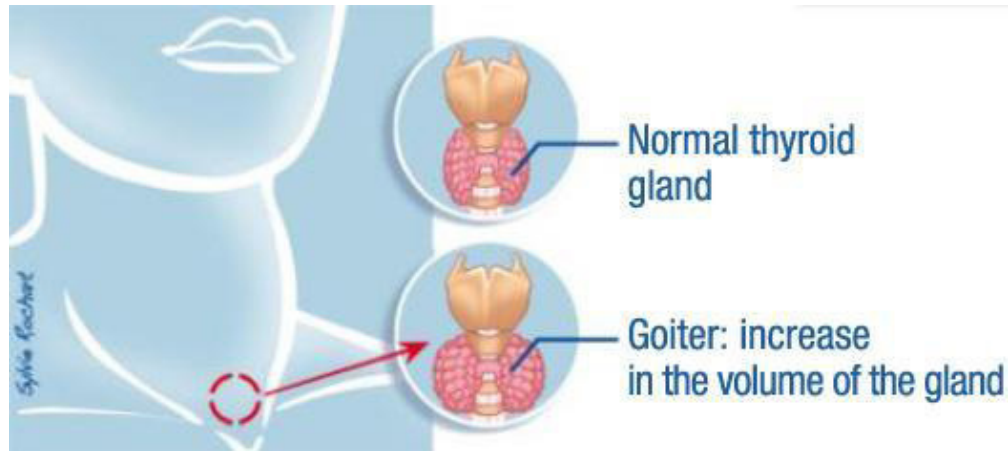


### Signs and symptoms of Graves' eye disease:

- eye movement is affected
- blurred vision
- double vision
- eyes can be painful, itchy, reddened, watery and feel gritty
- fluid collection in the eyelids and surrounding tissue
- eyes appear to be bulging

## Goitre

When the thyroid gland becomes enlarged this is called a goitre. It can affect one or both sides of the thyroid gland and usually grows slowly over time.



### Causes of goitre include:

- Hashimoto's disease (autoimmune hypothyroidism)
- Graves' disease (autoimmune hyperthyroidism)
- Large nodules on one or both sides of the thyroid gland
- Iodine deficiency (is extremely rare in New Zealand)

### Signs and symptoms of goitre

- tightness in the throat, coughing
- bulging neck appearance
- hoarseness
- trouble with swallowing
- trouble with breathing
- choking sensation

## Nodules

If a lump is felt in the thyroid, this is a nodule. Nodules that produce excessive amounts of hormones are hot nodules. Nodules which do not produce excessive hormones are cold nodules and do not need any investigation or treatment if they are small. Nodules can either be solid thyroid tissue growths or fluid filled cysts.

## Investigations

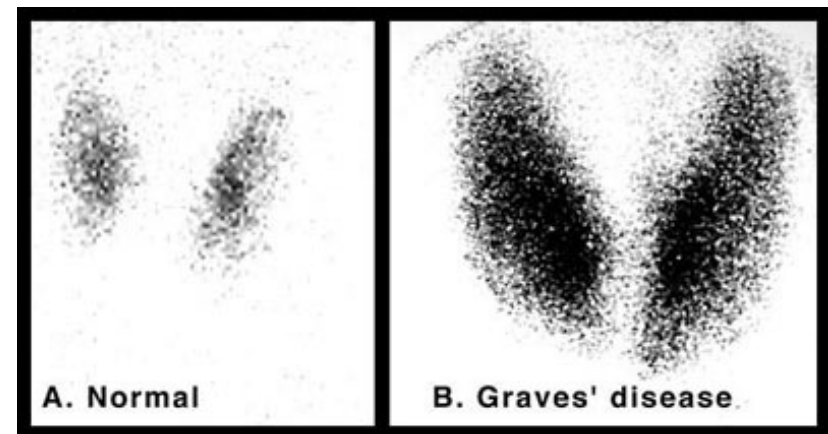
**Thyroid function test** – A blood sample is collected and tested for thyroid hormone levels. A low TSH level indicates an overactive thyroid. The frequency of thyroid function tests is usually between 6 - 12 weeks.

**Thyroid ultrasound** – An ultrasound is a non-invasive scan which is used to identify and assess the shape and size of any nodules or lumps in the thyroid gland.

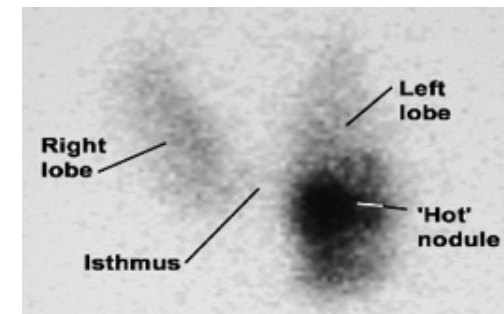
**Thyroid fine needle aspirate (FNA) biopsy** – A biopsy tissue sample is collected and examined to determine any suspicious changes in thyroid cells which would require further investigation. This can be performed in the clinic or at Radiology with ultrasound to guide the biopsy.

**Scintiscan** – is a functional scan to identify why the thyroid gland is producing too much thyroid hormone. This scan is done at Radiology Department.

In Graves' disease the scan will show increased activity across all of the gland.



Hot nodules show up as dark spots.



## Treatment Options

Treatment	Advantages	Disadvantages
Medication – <ul style="list-style-type: none"> <li>• Carbimazole</li> <li>• Propylthiouracil (PTU)</li> <li>• Beta-blocker</li> </ul>	Effective first-line treatment to control thyroid hormone function  Improves symptoms of hyperthyroidism and general wellbeing	<b>Side-effects</b> rash, itchiness, dizziness, nausea, vomiting, liver dysfunction, stomach pain  <b>Rare side-effects</b> Fever, sore throat, mouth ulcers <b>(see box below)</b>
<b>If you experience any of these side-effects please stop your medication and attend the emergency department for a full blood count test. Inform staff you are taking anti-thyroid medication and wait for your result.</b>		
Radioiodine (I131)	Non-invasive treatment  Simple to take  Permanent treatment	Family and social contact precautions after treatment  Graves' eye disease (Ophthalmopathy) could flare up  Up to 2 weeks off work  May require a second treatment  May require thyroxine replacement after treatment
Surgery	Resolves large goitre complications  Complex medication situations (side-effects or difficult to control hormone stability)  High-risk disease complications	Surgical risk (discuss with the surgeon)  Thyroxine replacement

## Treatment Options Explained

**Medication** – Taking thyroid medication regularly is effective first-line treatment to control and maintain thyroid hormone function. Most people do not experience side effects with Carbimazole or PTU.

A beta-blocker may be prescribed to control heart rate if this has been affected by hyperthyroidism.

**Medications and Pregnancy** – If you are pregnant or planning a pregnancy and are on treatment for hyperthyroidism, please contact your doctor or endocrinologist.

**Radioiodine (I-131)** – is a radioactive form of iodine used to permanently prevent some of the thyroid cells from making thyroid hormones. This usually involves one treatment and can correct an overactive thyroid over time. If this treatment is recommended for you then specific precautions are required for two weeks after treatment, and these are detailed in a separate booklet.

**Surgery** – is another option which is effective in managing disease especially if there is a large goitre which affects breathing and/or swallowing:

- Total thyroidectomy - surgical removal of all the thyroid gland
- Subtotal thyroidectomy - most of the thyroid gland is surgically removed
- Hemithyroidectomy - only one side of the thyroid gland is surgically removed

**Iodine** – is not a treatment for overactive thyroid problems or management of thyroid dysfunction. In some cases where surgery is required to treat uncontrolled thyrotoxicosis, Lugol's iodine solution (iodine drops) is given to temporarily block thyroid hormones and reduce blood supply through the gland just prior to surgery.

## What is Hypothyroidism?

An underactive thyroid is when your thyroid does not make enough thyroid hormones for your body's daily requirements. The T4 will be low and the TSH level will be high. Hypothyroidism is most commonly caused by the body's own immune system affecting the thyroid gland's ability to make T4 hormone. This is a common condition seen in the community and your GP can usually manage this condition by prescribing thyroxine hormone replacement.

Hypothyroidism can also be caused by over medication to block your overactive thyroid; for example Carbimazole, Propylthiouracil (PTU) and radioiodine (I131). An underactive thyroid from medication can be treated by either reducing the medication or balancing the hormones with thyroxine replacement.

### Signs and symptoms of hypothyroidism:

- feel the cold
- weight gain
- high cholesterol
- depression
- memory impairment
- feeling tired
- low heart rate
- low blood pressure
- muscle heaviness
- constipation
- pale, dry skin
- coarse, dry hair
- feeling sluggish
- menstrual irregularities

Some signs and symptoms are the same for hyper and hypothyroidism. This is because the body cannot function efficiently when the thyroid hormones are not balanced, regardless of the cause.

There is a lot of conflicting information available about thyroid disease. It is strongly advised that you discuss your diagnosis and treatment options with the Endocrine Clinic to ensure you are fully informed and can make the best decisions for your health.

Thyroid disease can affect your memory, levels of anxiety or even just managing day-to-day decisions. If you have any questions or are having trouble managing your treatment please call your GP or the clinic so we may support and help you manage your care.

## Track my Treatment

Date	TSH Target Range	TSH	T4	T3	Medication Dose	Symptoms	Test next due





**For further information  
please contact 06 878 8109**



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Hawke's Bay District Health Board supports and encourages  
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