

My thyroid gland

The thyroid gland is a small organ in the neck, just below the Adam's apple. Its job is to make a chemical called a **hormone**. The thyroid hormone is named **thyroxine**. A normal amount of thyroxine is required for normal physical and mental development. For this reason all babies in New Zealand are screened at birth for the presence of possible thyroid hormone deficiency. In adults, thyroxine keeps cells and tissues working at just the right metabolic rate. Too much thyroxine put out by an overactive thyroid causes an illness with a high metabolic rate called **hyperthyroidism**. Too little thyroxine from an underactive gland causes an illness with a low metabolic rate called **hypothyroidism**.

Goitre is the name given to a visible swelling of the thyroid gland in the neck. A goitre is usually normally active, neither under nor overactive. Most goitres cause no general symptoms and can often be ignored. Some people with a goitre may be advised to have simple diagnostic tests to find out exactly what kind of goitre it is and to test for the unlikely possibility of a low-grade cancer. Fortunately cancer of the thyroid is very rare. When it does occur it is nearly always low grade, can be removed by surgery and has a much better outlook than most other types of cancer.

Virtually all forms of thyroid disease can be easily treated resulting in good health. If left untreated, however, under or overactive glands can cause years of severe ill health or even death. After the initial assessment you may be asked to return to the clinic for follow-up in conjunction with your own doctor.

Hyperthyroidism (an overactive thyroid)

The exact cause of an overactive thyroid is unknown. The common form results from unusual antibodies circulating in the blood stream which stimulate the thyroid. Over-activity is not caused by stress or changes in the diet. It may wax and wane in an individual over a period of years. Women are more often affected than men and over-activity may appear for the first time three to six months after pregnancy.

Hyperthyroidism affects different people in different ways. Many experience weight loss (despite increased appetite), tiredness, nervous symptoms and a dislike of hot weather. Shakiness of the hands and awareness of a rapid heart beat and difficulty sleeping are also common. Hyperthyroidism is a prolonged illness which, if untreated, can have serious consequences. Everyone who has it needs treatment. Careful supervision by a doctor is also required, usually for many years.

Treatment of hyperthyroidism

There are three different ways to treat an overactive thyroid.

1) **Antithyroid Tablets** (Carbimazole or Propylthiouracil, PTU)

Once the diagnosis is made, most people are given tablets, usually 3 to 6 tablets per day. . If you take them regularly, there is a marked improvement of symptoms in most people after three to four weeks. These tablets act as a brake on the thyroid by blocking an enzyme in the gland. In themselves the tablets don't make the unknown cause of hyperthyroidism go away. But by taking the tablets for one or more years, the disorder may then disappear by itself as mysteriously as it came, just with the passage of time. You will enjoy excellent health as long as the tablets are taken *and* the level of thyroxine is monitored by a blood-test. If you forget a dose you can 'double-up' with the next dose. Even after a year or more of treatment however, on stopping the tablets hyperthyroidism returns in nearly two-thirds sometimes within weeks. In a minority, about one-third, there may be no return of symptoms even for years.

When beginning treatment with antithyroid drugs, most people suffer no ill effects. Rarely (3 to 4 in every thousand individuals) an important side effect may develop because of *lowering of the white cell count* in the blood. The symptoms of this side effect may include a *sore throat, mouth ulcers or high fever* and usually begin within two to six weeks of starting treatment. If you experience these effects while taking anti-thyroid tablets, you must contact your doctor immediately. It is stressed that this is a rare occurrence but it is important to be on the alert for it as your doctor can arrange measurement of your white blood count and the effect is rapidly reversed by stopping treatment.

A minor but irritating side effect in about 3% is an *itchy red skin rash* which also usually develops within two to six weeks of starting the tablets. This rash sometimes goes away by itself and the tablets can be continued but if it persists, you should stop the pills and contact your doctor for further advice. Often it is possible to switch to an alternate drug. If planning a pregnancy or during early pregnancy, propylthiouracil is preferred to carbimazole. *Antithyroid tablets can safely be taken while breast feeding.* Fortunately an overactive thyroid often subsides during pregnancy, only to return 2 to 6 months after delivery.

2) **Radioactive Iodine (= Radioiodine)**

Radioiodine treatment is often recommended once the overactive thyroid is brought under control with tablets. The great advantage of radioiodine is that it is given at an outpatient visit, as a single tasteless drink. It has little or no side effects but smoothly and painlessly cures the thyroid condition. Radioiodine is the most common form of treatment world-wide and has been in safe and effective use for 50 years.

Naturally, none of us likes the idea of taking in radioactive substances unless it is absolutely necessary. In the case of radioiodine given under a doctor's prescription, there is no cause for alarm. The radiation dose is concentrated in the thyroid - other parts of your body receive very little. In fact, most of the radioactivity is excreted in the urine. Because it is *radioactive iodine*, there are some precautions necessary in the first few days after treatment.

Precautions following Radioiodine treatment

Radioactive iodine is not given to pregnant women. Although there is no evidence of harm to family members, we advise against intimate or prolonged body contact for 2 to 4 days after treatment. Babies and children in particular, are thought to be more sensitive to unnecessary exposure to radiation.

The nature and duration of precautions will depend on the recommended dose and your family or job circumstances. More specific precautions as they apply to you will be discussed and written down by the clinic doctor.

After Radioiodine treatment.

The radioiodine does most of its work over the first 4 to 6 weeks but continued benefits such as shrinkage and disappearance of goitre continue for about 6 months. If you are taking antithyroid tablets, you will be asked to stop them 5 days before therapy and restart one week afterwards and continue until your first follow-up visit. Usually you will be asked to continue monitoring blood tests at 2-4 week intervals until the results are stable. Sometimes a second radioiodine treatment is needed in about a quarter of individuals for a complete cure.

An expected effect of treatment is that the thyroid gland may become *underactive* in as many as one half in the first year. If this occurs it will be necessary for you to take thyroxine tablets. This is a small inconvenience to ensure continued normal thyroid function but you will need to take thyroxine on a lifelong basis. At the same time, you will be discharged from the clinic to the care of your GP who will provide a three monthly prescription of thyroxine tablets and arrange an occasional blood test to ensure that your dose of thyroxine tablets is suitable.

Even if thyroid gland function remains normal in the first year treatment, a regular annual blood test of thyroid function is necessary indefinitely because an underactive thyroid can still happen many years after radioiodine treatment.

3) **Surgery**

Rarely, neither tablet nor radioiodine treatment is suitable and thyroid surgery may be recommended. There are definite risks to surgery and because of the safety and simplicity of radioiodine, operations are infrequent nowadays.

Hypothyroidism (= an under-active thyroid gland)

The exact cause of an under-active thyroid is unknown. The condition is caused by unusual antibodies which block the normal function of the thyroid and may eventually destroy it completely. It is an autoimmune disorder called Hashimoto's thyroiditis, after the name of the Japanese doctor who described the appearance of the gland under the microscope.

An under-active thyroid can also occur as a result of treatment by radioiodine or surgery. Often under-activity is detected only on a blood test without having caused any symptoms. If untreated, an under-active thyroid can cause a general slowing of metabolic rate and a slow-down in normal physical and mental function. Tiredness, unusual sensitivity to cold, muscle cramps and minor weight gain are common symptoms. The treatment involves a daily dose of thyroxine tablets. Although in tablet form, *thyroxine is a totally natural substance which is exactly the same as the thyroxine made by the normal thyroid gland*. It gives all the effects of a normal thyroid and, with this treatment, you can expect to have completely normal thyroid function. The tablets should be taken as a single daily dose on an empty stomach either before breakfast or before bed. If you forget a dose, you can simply "double-up" the next day. If you are also taking iron tablets, it is better to take them at a separate time because iron interferes with absorption of thyroxine.

Thyroid nodules or lumps

A single swelling or lump (= 'nodule') in the thyroid gland is a special form of goitre. Lumps in the neck of this kind are always worrying to a person because of the fear that it may be a cancer. However, 90% of the nodules are not cancer but a simple swelling of fluid (=cyst) or tissue with no tendency to cause ill health or to other parts of the body. The remaining 10% are nearly always a very low grade form of cancer which is readily treated by surgical removal, followed by treatment with radioiodine (as described above for overactive thyroid gland). Many lumps are not single but multiple and part of an innocent, non-cancerous, condition called **multinodular goitre**, which just means that several swellings are present.

If you have been referred to the clinic for diagnosis of a thyroid lump, you may be assessed by one or more of the following methods after an initial brief examination by a senior doctor.

1) **Ultrasound** scan may be requested to measure the *shape* of the thyroid. This is a painless test which uses the principle of echoes to assess internal tissues and especially whether tissues are solid or fluid (cystic).

2) **A thyroid scintigram or isotope scan.** This test measures the rate of *function* of the gland. It requires an injection of a tiny dose of a radioisotope which is uniquely taken up by your thyroid. The isotope emits gamma rays which are detected by a gamma camera in the Nuclear Medicine Department. The only discomfort from this test is that of lying on a table in the department while a large overhead camera takes your picture.

3) **Fine needle aspiration biopsy.** This test looks at the *cellular structure* of the thyroid directly. It is increasingly used now as the first test to look at the content of thyroid swellings. You may be advised to have a small sample of cells or fluid removed from your thyroid gland for microscopic examination. A tiny needle is used to suck the cells from the swelling. This is a minor procedure that causes about the same amount of discomfort as a

regular blood test but may give very helpful information. Side effects are rare and are usually limited to slight discomfort on swallowing for twenty-four hours and trivial bruising in the skin.

4) **Doctor consultation.** A clinic doctor will assess your specific problem, arrange and co-ordinate the tests and advise you about diagnosis, treatment and any follow-up required. Please do not hesitate to ask any questions about your condition. You may want to note your doctor's name in case you have queries later. From the above, you will appreciate that this assessment of a thyroid lump is likely to take most of the morning to complete.

Iodine

Many people are curious about the role of iodine and thyroid function.

Prevention: New Zealand is an iodine deficient country. Since 1940 the diet has been enriched with iodine in iodised salt but mild to moderate iodine deficiency persists. Healthy women may benefit infant development by taking an extra supplement, 150 - 200 ug iodine per day during pregnancy.

Treatment: Individuals with known thyroid disorders, particularly goitre or hyperthyroidism should NOT take extra supplements as excessive iodine can cause abnormal thyroid function.

Appointments:

Follow-up appointments are sent out by letter followed by a phone reminder a few weeks before the due date. If you have appointment queries, address changes, can't come or need to change the time or date phone the Clinic Scheduler.

Some appointments require radioiodine (¹³¹I) to be given for diagnosis or treatment are administered at Radiation Oncology, Grafton site followed some days later by scanning at the Greenlane Clinical Centre. Specific details and a map are sent by letter.

Greenlane Clinical Centre is a learning environment.

The thyroid clinic provides teaching for senior student doctors under supervision. This means that at any time, the person attending you may be either a senior medical student or a junior qualified person training for a specialist degree.

Scheduler queries phone :	Daniel :	307-4949 Ex 26 564
General queries phone :	Eileen:	307-4949 Ex 26 851

Dr Mike Croxson,
Clinical Director

Thyroid Clinic, 1st Floor, Bldg 4
Greenlane Clinical Centre
P O Box 92-189, Greenlane, Auckland 1005