

**In this issue of CMScript we focus on thyroid diseases and highlight which of these conditions are prescribed minimum benefit or PMB conditions. Medical schemes are required to fund the benefits prescribed in the Medical Schemes Act.**

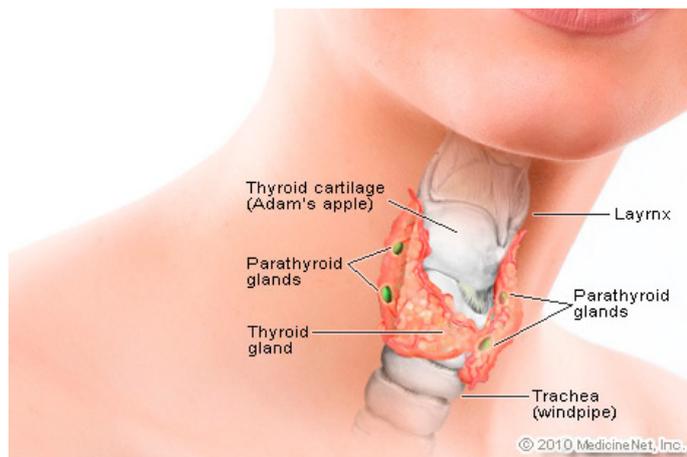
## The thyroid: critical to your good health

The thyroid gland is located below the Adam's apple and wraps around the trachea (windpipe) and produces hormones that are essential to our growth and the metabolism of our bodies. There are a number of different types of

Hypothalamus - TRH →

Pituitary gland - TSH →

Thyroid - T3 & T4



[http://www.medicinenet.com/image-collection/thyroid\\_picture/picture.htm](http://www.medicinenet.com/image-collection/thyroid_picture/picture.htm)

thyroid diseases and they can have a major impact on our health. However, thyroid disease can usually be successfully treated and it is therefore critical that it is identified and treated early.

## The thyroid hormones

The thyroid hormones include thyroxine (T4), triiodothyronine (T3) and thyroid stimulating hormone (TSH). The production of thyroid hormones however starts in the hypothalamus in the brain. The hypothalamus releases a hormone known as thyrotropin (TRH), which sends a signal to the pituitary gland which is located at the base of the brain from where it releases the thyroid stimulating hormone (TSH). TSH in turn sends a signal to the thyroid to release thyroid hormones. A disturbance at any of these levels causes an

error in thyroid hormone production resulting in a deficiency of thyroid hormone (hypothyroidism) and potentially in ill health.

Among the more common types of thyroid disease are hypothyroidism, hyperthyroidism, thyroiditis and cancer of the thyroid. Hypothyroidism (under activity of the thyroid) and hyperthyroidism (over activity of the thyroid) are the most prolific and are the focus of this article.

Hypothyroidism and hyperthyroidism are both included in the prescribed minimum benefit (PMB) regulations. Hypothyroidism is also included as a chronic disease, which means that a specific treatment algorithm or procedure is specified in the regulations.

## Hypothyroidism

Hypothyroidism is the most widespread thyroid disease and is characterised by abnormally low thyroid hormone production. Hypothyroidism is a very common condition that occurs more in women and its incidence increases with age.

### **Causes**

Some causes of hypothyroidism include:

- Hashimoto's thyroiditis or inflammation of the thyroid gland. This condition is an autoimmune disease where the body's immune system attacks and destroys thyroid tissue. The thyroid gland usually becomes enlarged

(goitre) and cannot produce the required thyroid hormones. Hashimoto's can be diagnosed by a blood test that checks for anti-TPO antibodies in the blood and/or by performing a thyroid scan.

- Radiation treatment for an overactive thyroid gland (hyperthyroidism) or cancers of the head and neck. This may have shrunk or destroyed the gland.
- Surgical removal of the thyroid gland as treatment for thyroid cancer, hyperthyroidism, goitre or cancerous thyroid nodules.
- Thyroiditis or inflammation of the thyroid gland may occur after an illness caused by a virus and may lead to temporary hypothyroidism.
- Failure of the pituitary gland to release sufficient TSH to stimulate production of the thyroid hormones.
- Congenital hypothyroidism is a condition in infants who are born without thyroid glands or with glands that cannot produce thyroid hormones.
- Iodine deficiency in the diet, or an excessive amount of iodine from foods such as seaweed.
- Medications, such as anti-thyroid drugs namely carbimazole that is used for treating an overactive thyroid, lithium carbonate, used in the treatment of psychiatric illness, or amiodarone, used for controlling abnormal heart rhythms.
- Inadequate production of thyroid hormones by the thyroid gland, called primary hypothyroidism.

### Symptoms

The following symptoms may be an indication of hypothyroidism:

- Weak slow heart beat
- Muscular weakness and constant fatigue
- Sensitivity to cold
- Thick puffy skin and/or dry skin
- Slowed mental processes and poor memory
- Constipation
- Goitre (increased size of the thyroid)

### Diagnoses

Hypothyroidism is diagnosed with a blood test. As the levels of the T3 and T4 may still be normal the detection of hyperthyroidism is the measurement of the TSH, the thyroid-stimulating hormone.

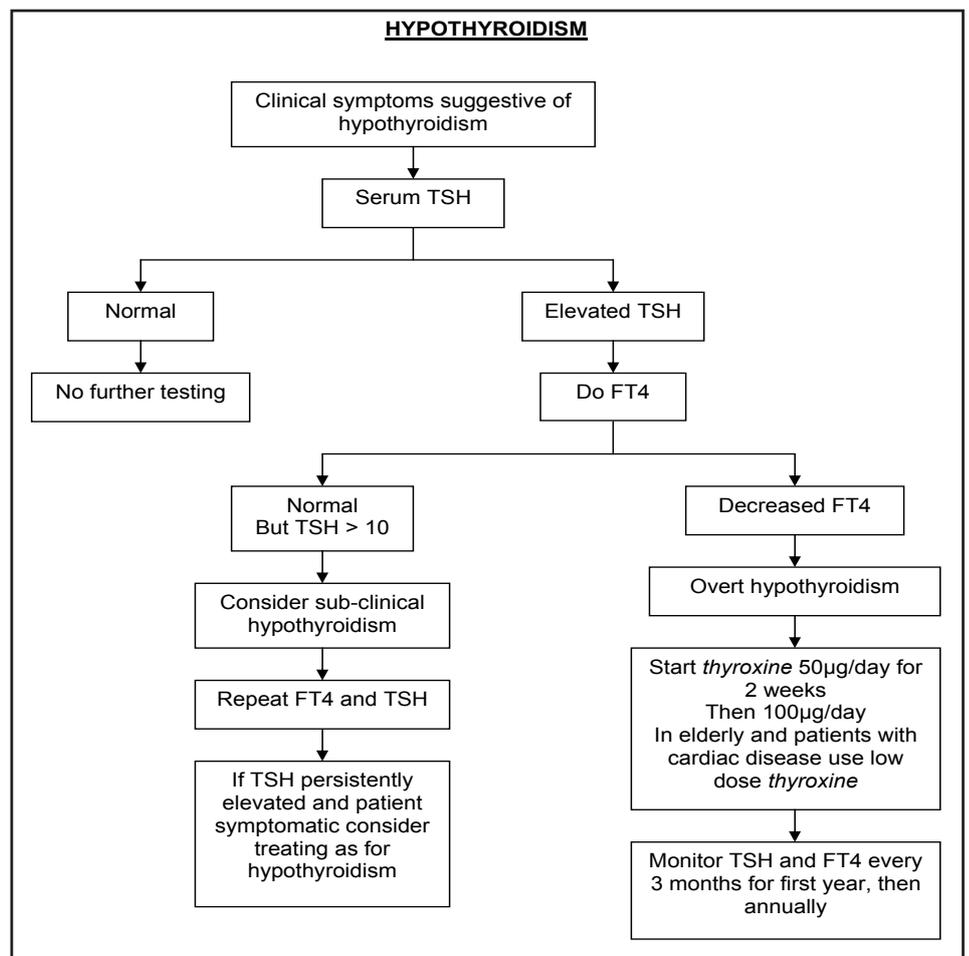
Thyroid stimulating hormone is manufactured in the pituitary gland in the brain and not in the thyroid itself. If a decrease of thyroid hormone occurs, the pituitary gland reacts by producing more TSH and the blood TSH level increases in an attempt to encourage thyroid hormone production. The TSH measurement is therefore increased in cases of hypothyroidism.

Only if the TSH is increased is it clinically necessary to measure the T4 count. It is not necessary to measure the T3 count as the T4 is converted into T3.

Abnormally low levels of TSH indicate that the hypothalamus or pituitary gland does not function correctly and does not produce sufficient TSH levels. This will also lead to hypothyroidism but the treatment will differ.

Hypothyroidism requires lifelong treatment with synthetic thyroxine. Treatment is usually provided as T4 (levothyroxine), which is more stable and requires once a day treatment. In most people the T4 is steadily converted into T3 in the bloodstream.

Hypothyroidism is included in the PMB regulations as



a chronic disease and a specific treatment algorithm prescribe what should be covered as PMB level of care.

The right leg of the algorithm details that the following must be funded with regards to the pathology tests and treatment for hypothyroidism:

- A TSH must be done first and only if the TSH has an

increased value is it necessary to do a FT4.

- If the FT4 is decreased, medicine management with thyroxine must be initiated. TSH and FT4 levels must be monitored every three months for the first year of diagnosis and then annually.

### Subclinical Hypothyroidism

The left side of the PMB algorithm deals with the diagnosis of subclinical hypothyroidism. Subclinical hypothyroidism refers to a condition in which members do not have the symptoms of hypothyroidism. The thyroid hormone levels are normal but the TSH is increased. This implies that the pituitary gland is working extra hard to stimulate the thyroid gland to produce the thyroid hormones. In the majority of cases the patient can be expected to eventually develop hypothyroidism.

The PMB algorithm specifies that if the TSH is increased to a level above 10 but the FT4 levels are normal, a diagnosis of subclinical hypothyroidism should be considered. The TSH and FT4 test should be repeated and if the TSH is persistently high and the member has symptoms, treatment with thyroxine should be started.

Evidence based literature suggests that the TSH and FT4 measurement should be repeated in four to six months.

### Hyperthyroidism

Hyperthyroidism is a condition in which the thyroid gland becomes overactive and produces an excessive amount of thyroid hormone.

#### Causes

Some common causes of hyperthyroidism include:

- Graves' disease - the thyroid gland does not respond to the normal control by the pituitary gland via TSH. The disease is hereditary and more common among women. Graves' disease may be associated with eye disease or skin disease.
- Functioning adenoma (nodule) and toxic multinodular goiter (TMNG). The thyroid gland becomes lumpier as we get older, and in the majority of cases, these lumps do not produce thyroid hormones and require no treatment. However in some cases a nodule does not respond to pituitary regulation via TSH and produces thyroid hormones independently. This is more likely if the nodule is larger than 3cm. A nodule that produces thyroid hormones is called a functioning nodule. If there is more than one such nodule, the term toxic multinodular goiter is used. Functioning nodules may be detected with a thyroid scan.
- Excessive intake of thyroid hormones. Taking too much

thyroid hormone is a common occurrence as many patients who are treated with thyroid hormones do not have regular follow-up blood tests. These patients can be identified by having a low uptake of radioactively labelled iodine (radioiodine) on a thyroid scan.

- Abnormal secretion of TSH. A tumour in the pituitary gland may produce an abnormally high secretion of TSH (the thyroid stimulating hormone) which leads to over signalling to the thyroid gland to produce thyroid hormones.
- Thyroiditis or inflammation of the thyroid gland of white blood cells known as lymphocytes (lymphocytic thyroiditis) may also occur. The inflammation may cause the thyroid gland to leak and an increased amount of thyroid hormone is released into the blood stream.
- Excessive iodine intake - The thyroid gland uses iodine to make thyroid hormones. An excess of iodine may cause hyperthyroidism. Certain foods, supplements and medications contain high levels of iodine and may lead to excessive intake.

#### Diagnoses

Hyperthyroidism may be suspected in patients with:

- Rapid forceful heartbeat
- Tremor
- Muscular weakness
- Weight loss in spite of increased appetite
- Restlessness, anxiety and sleeplessness
- Profuse sweating and heat intolerance
- Diarrhoea
- Eye changes
- Goitre (increased size of the thyroid)

Hyperthyroidism is diagnosed with a blood test that measures the levels of thyroid hormone. The main blood test is the measurement of the TSH levels. If increased amounts of thyroid hormones are present the TSH level falls in an attempt to reduce the production of thyroid hormone. If however the excessive amount of thyroid hormone is caused by a TSH-producing pituitary tumour, the levels of TSH will be abnormally high. If other conditions are suspected such as Graves' disease, antibody screening and a thyroid scan will be done. Thyroid scans are done using radioactively labelled iodine, which concentrates in the thyroid gland.

Hyperthyroidism is included in the PMB regulations under the diagnostic treatment pairs only when life-threatening complications are present or when surgery is required. The treatment specified in the PMB regulations includes all medical management and surgery:

## Treatment

Hyperthyroidism is treated with:

- Anti-thyroid drugs namely carbimazole are used to reduce the amount of thyroid hormone produced by the thyroid gland.
- Beta-blockers for example, propranolol (Inderal), atenolol (Tenormin) and metoprolol (Lopressor) are used to reduce the heart rate. These drugs are only used to treat the symptoms and do not reduce the amount of thyroid hormone that is produced.
- Corticosteroids are used to reduce the inflammation if thyroiditis (inflammation of the thyroid) is diagnosed.
- Radioactive iodine is used to destroy the thyroid tissues by direct radiation. The radioactive iodine is available in the form of a capsule or a liquid and is taken orally.
- Surgery may sometimes be used to partially remove the thyroid gland (partial thyroidectomy).

## References

<http://www.medicinenet.com/hypothyroidism/article.htm>

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## PMBs

Prescribed minimum benefits (PMBs) are defined by law. They are the minimum level of diagnosis, treatment, and care that your medical scheme must cover – and it must pay for your PMB condition/s from its risk pool and in full. There are medical interventions available over and above those prescribed for PMB conditions but your scheme may choose not to pay for them. A designated service provider (DSP) is a health-care provider (e.g. doctor, pharmacist, hospital) that is your medical scheme's first choice when you need treatment or care for a PMB condition. You can use a non-DSP voluntarily or involuntarily but be aware that when you choose to use a non-DSP, you may have to pay a portion of the bill as a co-payment. PMBs include 270 serious health conditions, any emergency condition, and 25 chronic diseases; they can be found on our website by accessing the link provided ([www.medicalschemes.com/medical\\_schemes\\_pmb/index.htm](http://www.medicalschemes.com/medical_schemes_pmb/index.htm)).

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