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## Thyroid - hypothyroidism

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### Summary

- The thyroid gland secretes hormones to regulate many metabolic processes, including growth and energy expenditure.
  - Hypothyroidism means the thyroid gland is underactive and fails to secrete enough hormones into the bloodstream.
  - Causes include the autoimmune condition Hashimoto's disease and insufficient dietary iodine.
  - Treatment is lifelong hormone replacement with thyroxine tablets.
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The thyroid gland is situated at the front of the throat, below the Adam's apple (larynx). It comprises two lobes that lie on either side of the windpipe, joined in front by an isthmus. The thyroid gland secretes hormones to regulate many metabolic processes, including growth and energy expenditure. Hypothyroidism means the thyroid gland is underactive and fails to secrete enough hormones into the bloodstream. This causes the person's metabolism to slow down.

Hypothyroidism is the most common thyroid disorder, and it is thought to affect around six to 10 per cent of women. The prevalence rises with age - up to a quarter of women over the age of 65 years may be affected. Men are also affected, but less frequently. Hypothyroidism can be either primary or secondary. Primary hypothyroidism means that the thyroid gland itself is diseased, while secondary hypothyroidism is caused by problems with the pituitary gland, the brain structure that supervises the thyroid gland. The most common cause of primary hypothyroidism is the autoimmune condition Hashimoto's disease.

### Symptoms of hypothyroidism

The symptoms of hypothyroidism can be mild, moderate or severe. In its severest form (myxoedema coma), hypothyroidism is potentially fatal and requires urgent medical treatment. Symptoms of hypothyroidism can include:

- fatigue and low energy levels
- depression
- slow heart rate
- unexplained weight gain
- intolerance to cold temperatures
- fatigued and aching muscles
- dry, coarse skin
- puffy face
- hair loss
- constipation
- problems with concentration
- goitre (enlarged thyroid gland).

### The thyroid hormones

The pituitary gland, located in the brain, prompts the thyroid to make its hormones by releasing thyroid stimulating hormone (TSH). The thyroid gland makes two main hormones - thyroxine (T4) and tri-iodothyronine (T3). These hormones contain atoms of iodine. Around 150 mcg (millionths of a gram) of dietary iodine is needed each day to produce adequate levels of thyroid hormones. Seafoods are particularly rich in iodine.

### Causes of hypothyroidism

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The causes of hypothyroidism include:

- **Iodine deficiency disorder** - lack of sufficient iodine in the diet can prevent the thyroid gland from making hormones. The thyroid enlarges as it attempts to comply with the pituitary gland's ceaseless chemical messages to produce more hormones. An enlarged thyroid is known as a goitre. Babies and children can be stunted and severely brain damaged by iodine deficiency because thyroid hormones are needed for normal growth and development.
- **Hashimoto's disease** - an autoimmune disorder. White blood cells and antibodies of the immune system attack and destroy the cells of the thyroid gland. Without treatment, death can occur within 10 to 15 years.
- **Treatment for hyperthyroidism** - treatments for hyperthyroidism (including drugs, surgery and radioactive iodine) frequently lead to hypothyroidism.
- **Surgery** - the primary treatment for thyroid cancer, and also a treatment for hyperthyroidism, surgery will lead to hypothyroidism if the thyroid gland is removed or if insufficient is left in place.
- **X-rays** - radiation treatments (in the past used for acne, tonsillitis and adenoid problems) can lead to hypothyroidism in later life. These treatments are not used today.
- **Particular drugs** - including lithium and the heart drug amiodarone can interfere with the normal processing of iodine and the production of thyroid hormone.
- **Birth defects** - sometimes, a baby is born with a congenital defect of the thyroid gland (which affects hormone production) or the thyroid may be completely absent. Without treatment, this can lead to brain damage and stunted growth.
- **Pituitary gland dysfunction** - the pituitary gland doesn't make enough thyroid stimulating hormone to prompt the thyroid to produce T3 and T4.
- **Hypothalamic dysfunction** - the functioning of the pituitary is influenced by another brain structure called the hypothalamus, through the thyrotropin-releasing hormone. Problems with the hypothalamus can affect the pituitary and, in turn, the thyroid gland.

### Diagnosis of hypothyroidism

Hypothyroidism is diagnosed by physical examination and blood tests. The doctor may also order ultrasound or radioactive iodine scans to check the internal structure of the thyroid.

### Treatment for hypothyroidism

Iodine deficiency can be easily relieved by increasing the intake of iodine through iodised salt or iodine rich foods. Hypothyroidism may be caused by the failure of - or damage to - the thyroid gland, pituitary or hypothalamus. In these cases, treatment focuses on boosting thyroid hormone levels with thyroxine tablets, a form of hormone replacement.

### From underactive to overactive

There is no cure for autoimmune hypothyroidism, so medication will have to be taken for the rest of the person's life. The dose must be carefully monitored. Too little medication won't relieve the symptoms. Too much medication can result in **hyperthyroidism** (resulting from too much thyroxin). It is important to see your doctor if you experience any symptoms of hyperthyroidism, including:

- heart palpitations
- unexplained and sudden weight loss
- agitation and nervousness
- increased sweating
- insomnia
- diarrhoea
- intolerance to hot temperatures.

### Where to get help

- Your doctor

### Things to remember

- The thyroid gland secretes hormones to regulate many metabolic processes, including growth and energy expenditure.
- Hypothyroidism means the thyroid gland is underactive and fails to secrete enough hormones into the bloodstream.
- Causes include the autoimmune condition Hashimoto's disease and insufficient dietary iodine.
- Treatment is lifelong hormone replacement with thyroxine tablets.

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