Hypothyroidism (underactive thyroid)

Definition
By Mayo Clinic staff
Hypothyroidism (underactive thyroid) is a condition in which your thyroid gland doesn’t produce enough of certain important hormones.

Women, especially those older than age 60, are more likely to have hypothyroidism. Hypothyroidism upsets the normal balance of chemical reactions in your body. It seldom causes symptoms in the early stages, but, over time, untreated hypothyroidism can cause a number of health problems, such as obesity, joint pain, infertility and heart disease.

The good news is that accurate thyroid function tests are available to diagnose hypothyroidism, and treatment of hypothyroidism with synthetic thyroid hormone is usually simple, safe and effective once you and your doctor find the right dose for you.

Symptoms
By Mayo Clinic staff
The signs and symptoms of hypothyroidism vary, depending on the severity of the hormone deficiency. But in general, any problems you have tend to develop slowly, often over a number of years.

At first, you may barely notice the symptoms of hypothyroidism, such as fatigue and weight gain, or you may simply attribute them to getting older. But as your metabolism continues to slow, you may develop more obvious signs and symptoms. Hypothyroidism signs and symptom may include:

- Fatigue
- Increased sensitivity to cold
- Constipation
- Dry skin
• Unexplained weight gain
• Puffy face
• Hoarseness
• Muscle weakness
• Elevated blood cholesterol level
• Muscle aches, tenderness and stiffness
• Pain, stiffness or swelling in your joints
• Heavier than normal or irregular menstrual periods
• Thinning hair
• Slowed heart rate
• Depression
• Impaired memory

When hypothyroidism isn't treated, signs and symptoms can gradually become more severe. Constant stimulation of your thyroid gland to release more hormones may lead to an enlarged thyroid (goiter). In addition, you may become more forgetful, your thought processes may slow, or you may feel depressed.

Advanced hypothyroidism, known as myxedema, is rare, but when it occurs it can be life-threatening. Signs and symptoms include low blood pressure, decreased breathing, decreased body temperature, unresponsiveness and even coma. In extreme cases, myxedema can be fatal.

**Hypothyroidism in infants**

Although hypothyroidism most often affects middle-aged and older women, anyone can develop the condition, including infants. Initially, babies born without a thyroid gland or with a gland that doesn't work properly may have few signs and symptoms. When newborns do have problems with hypothyroidism, they may include:

• Yellowing of the skin and whites of the eyes (jaundice). In most cases, this occurs when a baby's liver can't metabolize a substance called bilirubin, which normally forms when the body recycles old or damaged red blood cells.
• Frequent choking.
• A large, protruding tongue.

• A puffy appearance to the face.

As the disease progresses, infants are likely to have trouble feeding and may fail to grow and develop normally. They may also have:

• Constipation

• Poor muscle tone

• Excessive sleepiness

When hypothyroidism in infants isn't treated, even mild cases can lead to severe physical and mental retardation.

**Hypothyroidism in children and teens**
In general, children and teens who develop hypothyroidism have the same signs and symptoms as adults do, but they may also experience:

• Poor growth, resulting in short stature

• Delayed development of permanent teeth

• Delayed puberty

• Poor mental development

**When to see a doctor**
See your doctor if you're feeling tired for no reason or have any of the other signs or symptoms of hypothyroidism, such as dry skin, a pale, puffy face, constipation or a hoarse voice.

You'll also need to see your doctor for periodic testing of your thyroid function if you've had previous thyroid surgery; treatment with radioactive iodine or anti-thyroid medications; or radiation therapy to your head, neck or upper chest. However, it may take years or even decades before any of these therapies or procedures result in hypothyroidism.

If you have high blood cholesterol, talk to your doctor about whether hypothyroidism may be a cause. And if you're receiving hormone therapy for hypothyroidism, schedule follow-up visits as often as your doctor recommends. Initially, it's important to make sure you're receiving the correct dose of medicine. And over time, the dose you need may change.
Hashimotto's disease

Definition
By Mayo Clinic staff

Hashimoto's disease is a disorder that affects your thyroid, a small gland at the base of your neck, below your Adam's apple. The thyroid gland is part of your endocrine system, which produces hormones that coordinate many of your body's activities.

In Hashimoto's disease, also known as chronic lymphocytic thyroiditis, your immune system attacks your thyroid gland. The resulting inflammation often leads to an underactive thyroid gland (hypothyroidism). Hashimoto's disease is the most common cause of hypothyroidism in the United States. It primarily affects middle-aged women, but also can occur in men and women of any age and in children.

Doctors test your thyroid function to help detect Hashimotto's disease. Treatment of Hashimoto's disease with thyroid hormone replacement usually is simple and effective.

Causes

Hashimoto's disease is an autoimmune disorder in which your immune system creates antibodies that damage your thyroid gland. Doctors don't know what causes your immune system to attack your thyroid gland. Some scientists think a virus or bacterium might trigger the response, while others believe a genetic flaw may be involved.

A combination of factors, including heredity, sex and age, may determine your likelihood of developing the disorder. Hashimoto's disease is most common in middle-aged women and tends to run in families.

Goiter

Definition
By Mayo Clinic staff

Goiter is an enlargement of the thyroid gland. It may be caused by a variety of factors, including iodine deficiency, inflammation, or other thyroid disorders. Goiter can be detected through physical examination or imaging studies. Treatment may include thyroid hormone replacement or surgery.
Your thyroid is a butterfly-shaped gland located at the base of your neck just below your Adam's apple. Sometimes the thyroid gland grows larger than normal — a condition known as goiter. Although goiters are usually painless, a large goiter can cause a cough and make it difficult for you to swallow or breathe.

The most common cause of goiter worldwide is a lack of iodine in the diet. In the United States, where most people use iodized salt, goiter is more often due to the over- or underproduction of thyroid hormones or to nodules that develop in the gland itself.

Treatment depends on the size of the goiter, your symptoms and the underlying cause. Small goiters that aren't noticeable and don't cause problems usually don't need treatment.

**Causes**

*By Mayo Clinic staff*

Pituitary gland and hypothalamus

Your thyroid gland produces two main hormones — thyroxine and triiodothyronine (T-3). These hormones circulate in your bloodstream and help regulate your metabolism. They maintain the rate at which your body uses fats and carbohydrates, help control your body temperature, influence your heart rate, and help regulate the production of proteins. Your thyroid gland also produces calcitonin — a hormone that helps regulate the amount of calcium in your blood.

Your pituitary gland and hypothalamus control the rate at which these hormones are produced and released. The process begins when the hypothalamus — an area at the base of your brain that acts as a thermostat for your whole system — signals your pituitary gland to make a hormone known as thyroid-stimulating hormone (TSH). Your pituitary gland — also located at the base of your brain — releases a certain amount of TSH, depending on how much thyroxine and T-3 are in your blood. Your thyroid gland, in turn, regulates its production of hormones based on the amount of TSH it receives from the pituitary gland.

Having a goiter doesn't necessarily mean that your thyroid gland isn't working normally. Even when it's enlarged, your thyroid may produce normal amounts of hormones. It might also, however, produce too much or too little thyroxine and T-3.

A number of factors can cause your thyroid gland to enlarge. Among the most common are:
• **Iodine deficiency.** Iodine, which is essential for the production of thyroid hormones, is found primarily in seawater and in the soil in coastal areas. In the developing world, people who live inland or at high elevations are often iodine-deficient and can develop goiter when the thyroid enlarges in an effort to obtain more iodine. The initial iodine deficiency may be made even worse by a diet high in hormone-inhibiting foods, such as cabbage, broccoli and cauliflower. Although a lack of dietary iodine is the main cause of goiter in many parts of the world, this is not the case in countries where iodine is routinely added to table salt and other foods.

• **Graves' disease.** Goiter can sometimes occur when your thyroid gland produces too much thyroid hormone (hyperthyroidism). In Graves’ disease, antibodies produced by your immune system mistakenly attack your thyroid gland, causing it to produce excess thyroxine. This overstimulation causes the thyroid to swell.

• **Hashimoto's disease.** Goiter can also result from an underactive thyroid (hypothyroidism). Like Graves’ disease, Hashimoto's disease is an autoimmune disorder. But instead of causing your thyroid to produce too much hormone, Hashimoto's damages your thyroid so that it produces too little. Sensing a low hormone level, your pituitary gland produces more TSH to stimulate the thyroid, which then causes the gland to enlarge.

• **Multinodular goiter.** In this condition, several solid or fluid-filled lumps called nodules develop in both sides of your thyroid, resulting in overall enlargement of the gland.

• **Solitary thyroid nodules.** In this case, a single nodule develops in one part of your thyroid gland. Most nodules are noncancerous (benign) and don't lead to cancer.

• **Thyroid cancer.** Thyroid cancer is far less common than benign thyroid nodules. Cancer of the thyroid often appears as an enlargement on one side of the thyroid.

• **Pregnancy.** A hormone produced during pregnancy, human chorionic gonadotropin (HCG), may cause your thyroid gland to enlarge slightly.

• **Inflammation.** Thyroiditis is an inflammatory condition that can cause pain and swelling in the thyroid.

**Treatments and drugs**

*By Mayo Clinic staff*

Goiter treatment depends on the size of the goiter, your signs and symptoms, and the underlying cause. Your doctor may recommend:

• **Observation.** If your goiter is small and doesn't cause problems, and your thyroid is functioning normally, your doctor may suggest a wait-and-see approach.
• **Medications.** If you have hypothyroidism, thyroid hormone replacement with levothyroxine (Levothroid, Synthroid) will resolve the symptoms of hypothyroidism as well as slow the release of thyroid-stimulating hormone from your pituitary gland, often decreasing the size of the goiter. For inflammation of your thyroid gland, your doctor may suggest aspirin or a corticosteroid medication to treat the inflammation. For goiters associated with hyperthyroidism, you may need medications to normalize hormone levels.

• **Surgery.** Removing all or part of your thyroid gland (total or partial thyroidectomy) is an option if you have a large goiter that is uncomfortable or causes difficulty breathing or swallowing, or in some cases, if you have nodular goiter causing hyperthyroidism. Surgery is also the treatment for thyroid cancer. You may need to take levothyroxine after surgery, depending on the amount of thyroid removed.

• **Radioactive iodine.** In some cases, radioactive iodine is used to treat an overactive thyroid gland. The radioactive iodine is taken orally and reaches your thyroid gland through your bloodstream, destroying thyroid cells. The treatment results in diminished size of the goiter, but eventually may also cause an underactive thyroid gland. Hormone replacement with the synthetic thyroid hormone levothyroxine then becomes necessary, usually for life.