



## **Hypothyroidism: What You Should Know**

What is the thyroid gland?

The thyroid gland is a hormone-secreting gland that is located in the neck just below the Adam's apple. The thyroid gland secretes thyroid hormones, thyroxine (T4) and triiodothyronine (T3), into the bloodstream.

What do thyroid hormones do?

T4 is mostly converted into T3 in the liver and other peripheral tissues. T3, the more active of the two thyroid hormones, circulates in the bloodstream and eventually enters almost every cell in the body. T3 regulates cellular metabolism (energy utilization).

What is hypothyroidism?

Hypothyroidism is a condition in which the thyroid gland is underactive and secretes too little thyroid hormone into the circulation.

What are the symptoms of hypothyroidism?

Symptoms include fatigue, depression, increased need for sleep, dry skin, cold intolerance, hoarseness, weight gain, menstrual irregularity, and constipation.

What causes hypothyroidism?

Hypothyroidism is most often caused by Hashimoto's disease, radioactive iodine treatment, or surgical removal of the thyroid gland. Rarely, it may result from diseases of the pituitary gland or the hypothalamus.

What is Hashimoto's disease?

Hashimoto's disease is a disorder in which the body's immune system becomes overactive and forms antibodies (immune proteins) against the thyroid gland. These particular antibodies slowly destroy the thyroid gland, resulting in inadequate production of thyroid hormone. This type of condition is called an autoimmune disease.

How is the diagnosis of hypothyroidism made?

Hypothyroidism is characterized by low serum levels of free T4 and elevated serum levels of thyroid-stimulating hormone (TSH). TSH is a hormone made by the pituitary gland to stimulate the thyroid gland. When the thyroid gland becomes underactive, there is an increased need for TSH, causing the pituitary gland to make more of it.

What other tests are necessary to evaluate hypothyroidism?

Hashimoto's disease is diagnosed as the cause of hypothyroidism by the additional finding of antithyroid antibodies in the bloodstream; however, not all patients with Hashimoto's disease have a positive antithyroid antibody test. When hypothyroidism results from radioactive iodine therapy or from surgery, testing for these antibodies is not necessary.

Is Hashimoto's disease hereditary?

Yes. The tendency to develop Hashimoto's disease may be inherited. Relatives of patients with Hashimoto's disease have an increased risk of developing this condition. Family members also have an increased risk of having Graves' disease, which causes hyperthyroidism.

How is hypothyroidism treated?

Hypothyroidism is treated with oral thyroid hormone replacement.

What medications are used for thyroid hormone replacement?

LT4 is the medication of choice. LT4 is a synthetic form of T4 that is identical to the T4 the thyroid gland naturally makes. There are several different brands of LT4; the most commonly used are Synthroid, Unithroid, and Levoxyl. Generic LT4 is used less often because there is variation in the potency of the different preparations. Desiccated thyroid, also known as thyroid extract or natural thyroid, is made from the thyroid glands of slaughterhouse animals and contains both T4 and T3. Liotrix (Thyrolar) is a synthetic product that also contains both T4 and T3. These preparations are avoided by most practitioners because they contain higher amounts of T3 than the thyroid gland normally makes. As a result, these medications sometimes raise the T3 concentration in the bloodstream to abnormally high levels.

How is thyroid hormone replacement monitored?

Thyroid hormone should be taken in doses sufficient to bring the serum TSH and free T4 into the normal range; it is usually only necessary to monitor the serum TSH. It takes 5 to 6 weeks for oral thyroid hormone preparations to reach a constant or unchanging level in the bloodstream. Serum TSH is usually measured 6 to 12 weeks after starting thyroid hormone replacement and 6 to 12 weeks after each dosage adjustment. It should then be monitored every 6 to 12 months thereafter.

Do all symptoms resolve with thyroid hormone replacement?

Symptoms due to low serum thyroid hormone levels will generally resolve once the serum TSH and free T4 have returned to the normal range. However many of the symptoms of hypothyroidism are nonspecific. Other conditions may also cause the same symptoms. Some symptoms may persist despite adequate thyroid hormone replacement therapy.

Are there adverse effects of treating with too much thyroid hormone?

Excessive doses of thyroid hormone should be avoided because they may cause patients to develop osteoporosis, impaired heart function, and abnormal cardiac rhythms such as atrial fibrillation.

Are there adverse effects of treating with too little thyroid hormone?

Inadequate doses of thyroid hormone may fail to relieve the symptoms of hypothyroidism. Cardiac function is decreased and serum cholesterol levels may be elevated in patients with insufficient thyroid hormone replacement.

Do thyroid hormone tablets interact with other medications?

Iron pills, calcium supplements, fiber supplements, and antacids may interfere with the absorption of thyroid hormone from the intestine into the bloodstream. People who use any of these products should take them at least 4 hours apart from when they take their thyroid hormone tablets. Estrogens and medications used to treat seizures (convulsions) may decrease the effectiveness of thyroid hormone tablets; thyroid hormone doses may have to be increased in people who take these medications.

Is thyroid hormone replacement usually a lifelong requirement?

Once a person has developed hypothyroidism, the condition is usually permanent and thyroid hormone replacement is a lifelong requirement. Less common is temporary hypothyroidism in which thyroid function returns to normal; this usually happens with postpartum thyroiditis and certain other types of thyroiditis.

Table from *Physicians Information and Education Resource (PIER), Hypothyroidism* module.