

Hashimoto's Disease

National Endocrine and Metabolic Diseases Information Service



National Institute of
Diabetes and Digestive
and Kidney Diseases

What is Hashimoto's disease?

Hashimoto's disease, also called chronic lymphocytic thyroiditis or autoimmune thyroiditis, is an autoimmune disease. An autoimmune disease is a disorder in which the body's immune system attacks the body's own cells and organs. Normally, the immune system protects the body from infection by identifying and destroying bacteria, viruses, and other potentially harmful foreign substances.

In Hashimoto's disease, the immune system attacks the thyroid gland, causing inflammation and interfering with its ability to produce thyroid hormones. Large numbers of white blood cells called lymphocytes accumulate in the thyroid. Lymphocytes make the antibodies that start the autoimmune process.

Hashimoto's disease often leads to reduced thyroid function, or hypothyroidism. Hypothyroidism is a disorder that occurs when the thyroid doesn't make enough

thyroid hormone for the body's needs. Thyroid hormones regulate metabolism—the way the body uses energy—and affect nearly every organ in the body. Without enough thyroid hormone, many of the body's functions slow down. Hashimoto's disease is the most common cause of hypothyroidism in the United States.¹

Read more in *Hypothyroidism* at www.endocrine.niddk.nih.gov.

What is the thyroid?

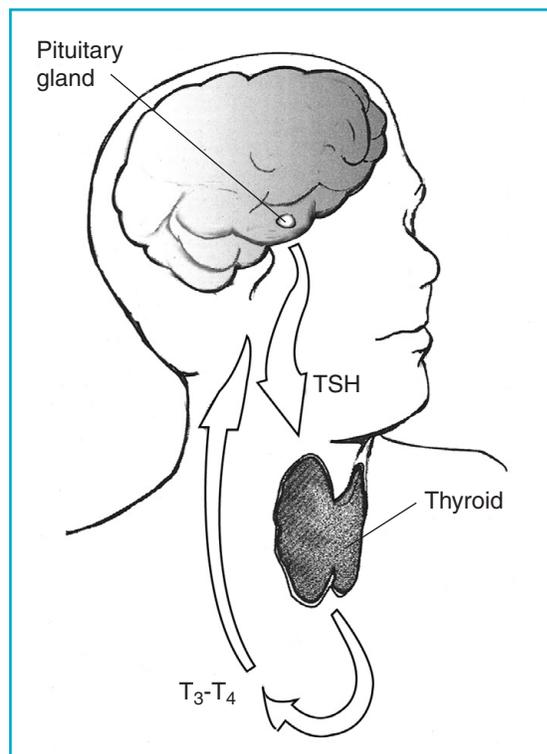
The thyroid is a 2-inch-long, butterfly-shaped gland weighing less than 1 ounce. Located in the front of the neck below the larynx, or voice box, it has two lobes, one on either side of the windpipe.

The thyroid is one of the glands that make up the endocrine system. The glands of the endocrine system produce and store hormones and release them into the bloodstream. The hormones then travel through the body and direct the activity of the body's cells.

¹Lee SL. Hashimoto thyroiditis. Medscape website. <http://emedicine.medscape.com/article/120937-overview>. Updated February 25, 2013. Accessed November 14, 2013.

The thyroid makes two thyroid hormones, triiodothyronine (T_3) and thyroxine (T_4). T_3 is the active hormone and is made from T_4 . Thyroid hormones affect metabolism, brain development, breathing, heart and nervous system functions, body temperature, muscle strength, skin dryness, menstrual cycles, weight, and cholesterol levels.

Thyroid-stimulating hormone (TSH), which is made by the pituitary gland in the brain, regulates thyroid hormone production. When thyroid hormone levels in the blood are low, the pituitary releases more TSH. When thyroid hormone levels are high, the pituitary decreases TSH production.



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What are the symptoms of Hashimoto's disease?

Many people with Hashimoto's disease have no symptoms at first. As the disease slowly progresses, the thyroid usually enlarges and may cause the front of the neck to look swollen. The enlarged thyroid, called a goiter, may create a feeling of fullness in the throat, though it is usually not painful. After many years, or even decades, damage to the thyroid causes it to shrink and the goiter to disappear.

Not everyone with Hashimoto's disease develops hypothyroidism. For those who do, the hypothyroidism may be subclinical—mild and without symptoms, especially early in its course. With progression to hypothyroidism, people may have one or more of the following symptoms:

- fatigue
- weight gain
- cold intolerance
- joint and muscle pain
- constipation, or fewer than three bowel movements a week
- dry, thinning hair
- heavy or irregular menstrual periods and problems becoming pregnant
- depression
- memory problems
- a slowed heart rate

Who is more likely to develop Hashimoto's disease?

Hashimoto's disease is much more common in women than men. Although the disease often occurs in adolescent or young women, it more commonly appears between 30 and 50 years of age.¹

Hashimoto's disease tends to run in families. Researchers are working to identify the gene or genes that cause the disease to be passed from one generation to the next.

Possible environmental factors are also being studied. For example, researchers have found that consuming too much iodine may inhibit thyroid hormone production in susceptible individuals. Chemicals released into the environment, such as pesticides, along with certain medications or viral infections may also contribute to autoimmune thyroid diseases.

People with other autoimmune diseases are more likely to develop Hashimoto's disease. The opposite is also true—people with Hashimoto's disease are more likely to develop other autoimmune diseases. These diseases include

- vitiligo, a condition in which some areas of the skin lose their natural color.
- rheumatoid arthritis, a disease that causes pain, swelling, stiffness, and loss of function in the joints when the immune system attacks the membrane lining the joints.
- Addison's disease, in which the adrenal glands are damaged and cannot produce enough of certain critical hormones.
- type 1 diabetes, in which the pancreas is damaged and can no longer produce insulin, causing high blood glucose, also called blood sugar.
- pernicious anemia, a type of anemia caused by not having enough vitamin B12 in the body. In anemia, the number of red blood cells is less than normal, resulting in less oxygen carried to the body's cells and extreme fatigue.
- celiac disease, a form of gastrointestinal gluten sensitivity, an autoimmune disorder in which people cannot tolerate gluten because it will damage the lining of the small intestine and prevent adsorption of nutrients. Gluten is a protein found in wheat, rye, and barley and in some products.
- autoimmune hepatitis, or nonviral liver inflammation, a disease in which the immune system attacks liver cells.

How is Hashimoto's disease diagnosed?

Diagnosis begins with a physical exam and medical history. A goiter, nodules, or growths may be found during a physical exam, and symptoms may suggest hypothyroidism. Health care providers will then perform blood tests to confirm the diagnosis. A blood test involves drawing blood at a health care provider's office or a commercial facility and sending the sample to a lab for analysis. Diagnostic blood tests may include the

- **TSH test.** The ultrasensitive TSH test is usually the first test performed. This test detects even tiny amounts of TSH in the blood and is the most accurate measure of thyroid activity available. Generally, a TSH reading above normal means a person has hypothyroidism.
- **T₄ test.** The T₄ test measures the actual amount of thyroid hormone circulating in the blood. In hypothyroidism, the level of T₄ in the blood is lower than normal.
- **antithyroid antibody test.** This test looks for the presence of thyroid autoantibodies, or molecules produced by a person's body that mistakenly attack the body's own tissues. Two principal types of antithyroid antibodies are
 - anti-TG antibodies, which attack a protein in the thyroid called thyroglobulin

- anti-thyroperoxidase (TPO) antibodies, which attack an enzyme called thyroperoxidase in thyroid cells that helps convert T₄ to T₃. Having TPO autoantibodies in the blood means the body's immune system attacked the thyroid tissue in the past. Most people with Hashimoto's disease have these antibodies, although people whose hypothyroidism is caused by other conditions do not.

A health care provider may also order imaging tests, including an ultrasound or a computerized tomography (CT) scan.

- **Ultrasound.** Ultrasound uses a device, called a transducer, that bounces safe, painless sound waves off organs to create an image of their structure. A specially trained technician performs the procedure in a health care provider's office, an outpatient center, or a hospital, and a radiologist—a doctor who specializes in medical imaging—interprets the images; a patient does not need anesthesia.

The images can show the size and texture of the thyroid, as well as a pattern of typical autoimmune inflammation, helping the health care provider confirm Hashimoto's disease. The images can also show nodules or growths within the gland that suggest a malignant tumor.

- **CT scan.** CT scans use a combination of x rays and computer technology to create images. For a CT scan, a health care provider may give the patient a solution to drink and an injection of a special dye, called contrast medium. CT scans require the patient to lie on a table that slides into a tunnel-shaped device where the x rays are taken. An x-ray technician performs the procedure in an outpatient center or a hospital, and a radiologist interprets the images. The patient does not need anesthesia. In some cases of Hashimoto's disease, a CT scan is used to examine the placement and extent of a large goiter, and to show a goiter's effect on nearby structures.

Read more in *Thyroid Tests* at www.endocrine.niddk.nih.gov.

How is Hashimoto's disease treated?

Treatment generally depends on whether the thyroid is damaged enough to cause hypothyroidism. In the absence of hypothyroidism, some health care providers treat Hashimoto's disease to reduce the size of the goiter. Others choose not to treat the disease and simply monitor their patients for disease progression.

Hashimoto's disease, with or without hypothyroidism, is treated with synthetic thyroxine, which is man-made T₄. Health care providers prefer to use synthetic T₄, such as Synthroid, rather than synthetic T₃, because T₄ stays in the body longer,

ensuring a steady supply of thyroid hormone throughout the day. The thyroid preparations made with animal thyroid are not considered as consistent as synthetic thyroid (Levothyroxine) and rarely prescribed today.

Health care providers routinely test the blood of patients taking synthetic thyroid hormone and adjust the dose as necessary, typically based on the result of the TSH test. Hypothyroidism can almost always be completely controlled with synthetic thyroxine, as long as the recommended dose is taken every day as instructed.

How does Hashimoto's disease affect pregnant women?

During pregnancy, hypothyroidism is usually caused by Hashimoto's disease and occurs in three to five out of every 1,000 pregnancies.² Uncontrolled hypothyroidism raises the chance of miscarriage, premature birth, stillbirth, and preeclampsia—a dangerous rise in blood pressure in late pregnancy.

Untreated hypothyroidism during pregnancy may also affect the baby's growth and brain development. Thyroid medications can help prevent these problems and are safe to take during pregnancy. Women with Hashimoto's disease should discuss their condition with their health care provider before becoming pregnant.

Read more in *Pregnancy and Thyroid Disease* at www.endocrine.niddk.nih.gov.

²Ogunyemi DA. Autoimmune thyroid disease and pregnancy. Medscape website. <http://emedicine.medscape.com/article/261913-overview>. Updated March 8, 2012. Accessed November 14, 2013.

Eating, Diet, and Nutrition

Iodine is an essential mineral for the thyroid. However, people with Hashimoto's disease may be sensitive to harmful side effects from iodine. Taking iodine drops or eating foods containing large amounts of iodine—such as seaweed, dulse, or kelp—may cause or worsen hypothyroidism. Read more in *Iodine in diet* at www.nlm.nih.gov/medlineplus/ency/article/002421.htm.

Women need more iodine when they are pregnant—about 220 micrograms a day—because the baby gets iodine from the mother's diet. Women who are breastfeeding need about 290 micrograms a day. In the United States, about 7 percent of pregnant women may not get enough iodine in their diet or through prenatal vitamins.³ Pregnant women should choose iodized salt—salt supplemented with iodine—over plain salt and take prenatal vitamins containing iodine to ensure this need is met.

To help ensure coordinated and safe care, people should discuss their use of complementary and alternative medical practices, including their use of dietary supplements such as iodine, with their health care provider. Tips for talking with health care providers are available at the National Center for Complementary and Alternative Medicine's Time to Talk campaign at www.nccam.nih.gov/timetotalk.

Points to Remember

- Hashimoto's disease, also called chronic lymphocytic thyroiditis or autoimmune thyroiditis, is an autoimmune disease.
- Hashimoto's disease often leads to reduced thyroid function, or hypothyroidism. Hypothyroidism is a disorder that occurs when the thyroid doesn't make enough thyroid hormone for the body's needs.
- Hashimoto's disease is the most common cause of hypothyroidism in the United States. Many people with Hashimoto's disease have no symptoms at first. As the disease slowly progresses, the thyroid usually enlarges and may cause the front of the neck to look swollen. The enlarged thyroid, called a goiter, may create a feeling of fullness in the throat, though it is usually not painful.
- Not everyone with Hashimoto's disease develops hypothyroidism. For those who do, the hypothyroidism may be subclinical—mild and without symptoms, especially early in its course.
- Hashimoto's disease is much more common in women than men. Although the disease often occurs in adolescent or young women, it more commonly appears between 30 and 50 years of age.

³Lee SL. Iodine deficiency. Medscape website. <http://emedicine.medscape.com/article/122714-overview>. Updated January 27, 2012. Accessed November 14, 2013.

- Hashimoto's disease, with or without hypothyroidism, is treated with synthetic thyroxine, which is man-made T₄.
- Women with Hashimoto's disease should discuss their condition with their health care provider before becoming pregnant.
- Pregnant women should choose iodized salt—salt supplemented with iodine—over plain salt and take prenatal vitamins containing iodine.
- People should discuss their use of dietary supplements, such as iodine, with their health care provider.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports research into many kinds of disorders, including Hashimoto's disease. Researchers throughout the United States and the world are working to better understand, prevent, and treat this disease, including those who are trying to identify the genes that make some people susceptible to autoimmune thyroid diseases.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at www.nih.gov/health/clinicaltrials. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

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Acknowledgments

Publications produced by the NIDDK are carefully reviewed by both NIDDK scientists and outside experts. This publication was reviewed by Leonard Wartofsky, M.D., M.A.C.P., Washington Hospital Center.

You may also find additional information about this topic by visiting MedlinePlus at www.medlineplus.gov.

This publication may contain information about medications and, when taken as prescribed, the conditions they treat. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1-888-INFO-FDA (1-888-463-6332) or visit www.fda.gov. Consult your health care provider for more information.

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NIH Publication No. 14-6399
February 2014