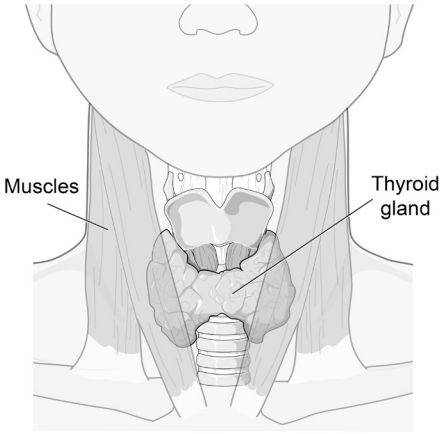
Graves' Disease in Pediatrics

Graves' disease is a common cause of an overactive thyroid. It occurs in about 1 in 5000 children and teenagers and is more common in females than males. Please ask your nurse or doctor if you have more questions about Graves' disease.

Thyroid Gland

The **thyroid gland** is a butterfly-shaped gland found in the front of the neck. It is part of the **endocrine system**. This means it makes hormones and sends them into the bloodstream where they can act on other parts of the body. The thyroid gland uses iodine and other building blocks to make two hormones: **thyroxine** (called **T4**) and **triiodothyronine** (called **T3**). Thyroid hormones act like the body's "gas pedal," to control the speed of growth, body and brain development, and normal metabolism.



The thyroid system is controlled by centers in the brain called the **hypothalamus** and the **pituitary gland**. When the body needs more thyroid hormone, the pituitary releases **thyroid stimulating hormone** (**TSH**) which causes the thyroid to raise the body's level of thyroid hormones.

Hyper vs Hypothyrodism

Producing too much thyroid hormone is called **hyperthyroidism** (hyper – meaning "too much"). Low levels of thyroid in the body cause **hypothyroidism** (hypo – meaning "too little"). Both may occur while treating Graves' disease.

Symptoms of Hyperthyroidism (too much T3 and T4)

- Feeling hot when nobody else does
- Sweaty skin
- Diarrhea
- Feeling nervous or restless, having trouble falling or staying asleep
- Short attention span
- Weight loss
- Increased appetite
- Rapid heart rate
- Muscle weakness or tremors
- Irritability
- Fine hair

Symptoms of Hypothyroidism (too little T3 and T4)

- Feeling cold when nobody else does
- Cool, dry skin
- Constipation
- Fatigue
- Slow growth and weight gain
- Poor appetite
- Coarse, dry, thin hair

Graves Disease

Graves' disease is an **autoimmune** disease. You have an immune system which makes **antibodies** that help the body fight disease. Antibodies attach to foreign particles in the body to help destroy them. But when the immune system makes antibodies against normal parts of the body, called "autoantibodies", autoimmune disorders

like Graves' disease occur.

In Graves' disease, the body's immune system makes an antibody (**TRAb**) that acts like TSH and tells it to make too much thyroid hormone. The result is hyperthyroidism.

The reason the body makes antibodies against the thyroid gland in Graves' disease is not fully known, though genetics may increase risk.

Signs/Symptoms
Your doctor may look for these things to check if you have Graves' disease.:

- Weight loss or rapid growth
- Fast heart rate
- Increased blood pressure and bounding pulses
- Fast reflexes or tremors
- Enlarged thyroid gland called a **goiter**
- Bulging eyes **(exophthalmos),** dry eyes, excess tearing, aching or burning behind the eye, light sensitivity

Your doctor may also request these blood tests:

- **TSH** – this is **low** if you have hyperthyroidism.
- **Free T3 and Free T4–** these are **high** if you have hyperthyroidism.
- **TRAb –** this antibody is **present** in almost all people with Graves' disease.

Graves' Disease Treatment

Medicines
In children, methimazole is the first treatment used for Graves' disease. This is an anti-thyroid medicine that causes the thyroid gland to make and release less thyroid hormone.

About 5% of Graves' disease patients taking methimazole have **side effects.** Side effects include skin rashes, liver problems, and joint pain. You will need blood tests to watch for these side effects. Rarely, problems with white blood cell production can cause high fever and throat or mouth infections. Call your doctor if you have these symptoms.

When your symptoms of hyperthyroidism are severe, you may need **beta-blockers** (e.g., **propranolol** or **atenolol**) to block the effects of the thyroid hormones in the body. Often, you only need beta-blockers for just a few weeks until methimazole brings the thyroid hormone levels into the normal range.

You will likely need treatment for two or more years. Medicines often work well to lower thyroid hormone levels, but do not decrease the size of the thyroid gland nor treat the eye problems caused by Graves' disease.

If hyperthyroidism persists, next steps include surgery or radioactive iodine. Either of these treatments can cause hypothyroidism that you will manage with daily thyroid hormone medicine. Since every person with Graves' disease is unique, you and your doctor will discuss the best treatment options for you.

Surgery
An overactive thyroid gland can be removed by surgery, called a **thyroidectomy.** Side effects are rare. Risks include damage to the nearby parathyroid glands that control calcium levels, damage to the nerve that controls the vocal cords or not enough thyroid being removed.

Radioactive Iodine
Radioactive iodine is a permanent treatment option for overactive thyroid. Because iodine is a key building block of thyroid hormones, the thyroid gland takes up radioactive iodine which then destroys the thyroid cells. You may need more than one treatment. The risk of getting cancer or having children with birth defects is very low for patients who have this treatment.

Length of Treatment
Treatments for Graves' disease can control hyperthyroidism, but they do not cure the autoimmune disease. In some people, Graves' disease goes away after 18-24 months, but for most people it lasts longer.

Even after treatment, the autoimmune disease can remain active and impact other aspects of health. Ask your doctor about what this means for you.

Graves' Eye Disease
Eye symptoms with Graves' disease are often mild and treatable. If you have any eye symptoms, your doctor may suggest you see an eye doctor **(ophthalmologist**).

What You Can Do
One of the best things you can do is to learn more about the thyroid and Graves' disease.

Follow your treatment plan by taking your medicine as prescribed every day. Regular clinic visits and blood tests will also help your doctors and nurses keep you healthy. Feel free to ask your doctor or nurse any questions you may have.

To Find Out More
Graves' Disease and Thyroid Foundation
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info@gdatf.org

The American Thyroid Association www.thyroid.org

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 10/2024. University of Wisconsin Hospital and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#6653