



Graves' Disease

WHAT IS THE THYROID GLAND?

The thyroid gland, located at the front of your neck, produces two thyroid hormones: thyroxine (T4) and triiodothyronine (T3). T4 and T3 regulate how the body uses energy. This is sometimes called your metabolism.

How well the thyroid works is controlled by another gland called the pituitary, which is located in your brain. The pituitary produces thyroid-stimulating hormone (TSH), which tells the thyroid to produce T4 and T3.

WHAT IS GRAVES' DISEASE?

Graves' disease is an autoimmune disease. This means your immune system, which normally protects your body and helps fight disease, produces antibodies that attack the thyroid gland. These antibodies act like TSH and cause the gland to make too much thyroid hormone. This condition is called hyperthyroidism. Although it can occur at any age in men or women, Graves' disease is more common in women between age 20 and 50, who often have a family history of thyroid disease.

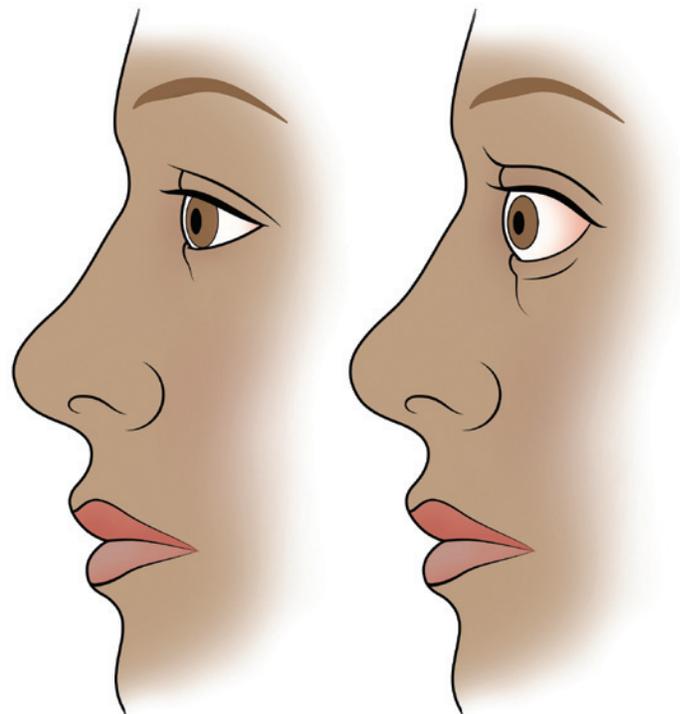
DID YOU KNOW?

The thyroid gland uses iodine, which comes from the foods you eat, to make thyroid hormone.

WHAT ARE THE COMPLICATIONS OF GRAVES' DISEASE?

If left untreated, hyperthyroidism can lead to heart failure or brittle bones (osteoporosis). Pregnant women with uncontrolled Graves' disease are at greater risk of miscarriage, premature birth, and having a baby with low birth weight.

Graves' disease can also cause swelling behind the eyes that sometimes makes them bulge outward. This condition is called Graves' ophthalmopathy and is relatively rare.



Normal eye

Graves' ophthalmopathy

HOW IS GRAVES' DISEASE DIAGNOSED?

Your doctor will do a physical exam and may use different types of tests to diagnose Graves' disease:

- **Physical exam.** Your doctor will
 - look for enlargement of your thyroid gland and eye irritation
 - check your pulse
 - look for signs of trembling
 - ask about your symptoms and your personal and family medical histories
- **Blood tests.** When thyroid hormone levels are high, the pituitary doesn't need to make as much TSH. Very low levels of TSH and high levels of T4 in your blood suggest hyperthyroidism.
- **Radioactive iodine uptake test.** The thyroid absorbs iodine from your blood and uses it to make thyroid hormone. When the thyroid produces too much thyroid hormone, it absorbs more iodine. This test involves swallowing a capsule containing a small, harmless amount of radioactive iodine. The amount of iodine taken up by your thyroid is then measured. A high uptake of radioactive iodine suggests Graves' disease.

HOW IS GRAVES' DISEASE TREATED?

Graves' is a treatable disease that can be well controlled. Several treatments are available.

- **Antithyroid medications** lower the amount of hormone the thyroid makes. The preferred drug is methimazole. For pregnant or breastfeeding women, propylthiouracil (PTU) may be preferred. These medications help control but may not cure the condition, and are generally not taken for a long period of time.
- **Beta blockers** can control many symptoms, especially rapid heart rate, trembling, and anxiety. But they do not cure the disease because the thyroid still produces too much thyroid hormone.
- **Radioactive iodine** (in amounts much higher than the amount used in the radioactive iodine uptake test) will cure the thyroid problem. However, it usually destroys the thyroid. You will probably need to take thyroid hormone pills for the rest of your life to have normal hormone levels. Radioactive iodine treatment may make the symptoms of Graves' ophthalmopathy worse but it's often treatable with a steroid medication (prednisone).
- **Surgery** removes the thyroid. Surgery is a permanent solution, but not usually preferred because of the risk of damaging the nearby parathyroid glands (which control calcium metabolism in the body) and the nerves to the larynx (voice box). Surgery is recommended when neither antithyroid medication nor radioactive iodine therapy is appropriate.

POSSIBLE SIGNS AND SYMPTOMS OF GRAVES' DISEASE

- Goiter (enlarged thyroid gland)
- Bulging, itchy or swollen eyes
- Difficulty breathing
- Anxiety, irritability
- Difficulty sleeping, fatigue
- Rapid or irregular heartbeat, trembling fingers
- Excess sweating, heat sensitivity
- Weight loss, despite normal food intake
- Changes in hair, skin

Questions to ask your doctor

- What tests will I need to find out if my hyperthyroidism is caused by Graves' disease?
- Why is radioactive iodine safe when it's used for testing, but destroys the thyroid when it's used for treatment?
- Does radioactive iodine cause cancer?
- Can I take antithyroid medications or do I need a permanent treatment?
- How often should I see my doctor after treatment?
- Should I see an endocrinologist for my care?

RESOURCES

- Find-an-Endocrinologist: www.hormone.org or call 1-800-HORMONE (800-467-6663)
- Hormone Health Network information on thyroid disorders: www.hormone.org/Resources/thyroid-disorders.cfm
- American Thyroid Association: www.thyroid.org
- Mayo Clinic: www.mayoclinic.com/health/graves-disease/DS00181
- National Endocrine and Metabolic Diseases Information Service (NIH): www.endocrine.niddk.nih.gov/pubs/graves
- National Graves' Disease Foundation: www.ngdf.org

EDITORS

Elliot Levy, MD
Leonard Wartofsky, MD

The Hormone Health Network offers free, online resources based on the most advanced clinical and scientific knowledge from The Endocrine Society (www.endo-society.org). The Network's goal is to move patients from educated to engaged, from informed to active partners in their health care. This fact sheet is also available in Spanish at www.hormone.org/Spanish.

