

## What is Graves' disease?

Graves' disease, a type of hyperthyroidism, is caused by a generalized overactivity of the entire thyroid gland. It is named for Robert Graves, an Irish physician, who was the first to describe this form of hyperthyroidism about 150 years ago.

### ADDITIONAL PATIENT RESOURCES [WWW.THYROID.ORG](http://WWW.THYROID.ORG)

For further details on this and other thyroid-related topics, please visit the patient resources section on the American Thyroid Association website at [www.thyroid.org](http://www.thyroid.org)

## 1 SYMPTOMS

### What are the symptoms of Graves' disease?

- **Hyperthyroidism**

The hyperthyroid symptoms of Graves' disease are often the same as those caused by other types of hyperthyroidism (see the [Hyperthyroidism brochure](#)).

- **Eye disease**

Graves' disease is the only kind of hyperthyroidism that has inflammation of the eyes, swelling of the tissues around the eyes, and bulging of the eyes (called Graves' ophthalmopathy). The cause of these problems is unknown. Although many patients with Graves' disease have redness and irritation of the eyes at some time, less than 1% ever develop enough inflammation of the eye tissues to cause serious or permanent trouble. Patients who have severe eye symptoms may benefit from visiting an eye doctor (an ophthalmologist).

Eye symptoms generally begin about 6 months before or after the diagnosis of Graves' disease has been made. Seldom do eye problems occur long after the disease has been treated. In some patients with eye symptoms, hyperthyroidism never develops. The severity of the eye problems is not related to the severity of the hyperthyroidism. Early signs of trouble might be red or inflamed eyes or a bulging of the eyes due to inflammation of the tissues behind the eyeball. Diminished or double vision are rare problems that usually occur later. We do not know why, but problems with the eyes occur much more often in people with Graves' disease who smoke cigarettes than in those who don't smoke.

- **Skin disease**

Rarely, patients with Graves' disease develop a lumpy reddish thickening of the skin in front of the shins known as *pretibial myxedema*. This skin condition is usually painless and is not serious. Like the eye trouble of Graves' disease, the skin problem does not necessarily begin precisely when the hyperthyroidism starts. Its severity is not related to the level of thyroid hormone. We don't know why this problem is usually limited to the lower leg or why so few people have it.

## 2 CAUSES

### What causes Graves' disease?

Graves' disease is triggered by some process in the body's immune system, which normally protects us from foreign invaders such as bacteria and viruses. The immune system destroys foreign invaders with substances called *antibodies* produced by blood cells known as *lymphocytes*. Many people inherit an immune system that can cause problems. Their lymphocytes make antibodies against their own tissues that stimulate or damage them. In Graves' disease, antibodies bind to the surface of thyroid cells and stimulate those cells to overproduce thyroid hormones. This results in an overactive thyroid. Physicians have long suspected that severe emotional stress, such as the death of a loved one, can set off Graves' disease in some patients. Dr. Graves himself commented on stressful events in his patients' lives that came several months before the development of hyperthyroidism. However, many patients who develop Graves' disease report no stress in their lives.

## 3 DIAGNOSIS

### How is the diagnosis of Graves' disease made?

The diagnosis of hyperthyroidism is made on the basis of findings during a physical exam and confirmed by laboratory tests that measure the amount of thyroid hormone (thyroxine, or T4, and triiodothyronine, or T3) and thyroid-stimulating hormone (TSH) in your blood (see the [Hyperthyroidism brochure](#)). Sometimes your doctor may want you to have a radioactive image, or scan, of the thyroid to see whether the entire thyroid gland is overactive. Your doctor may also wish to do a blood test to confirm the presence of thyroid-stimulating antibodies (TSAb) that cause Graves' disease, but this test is not usually necessary.

Clues that your hyperthyroidism is caused by Graves' disease are the presence of Graves' eye disease (see above), an enlarged thyroid, and a history of other family members with thyroid problems. Some relatives may have had hyperthyroidism or an underactive thyroid; others may have acquired gray hair prematurely (beginning in their 20's). Similarly, there may be a history of related immune problems in the family, including juvenile diabetes, pernicious anemia (due to lack of vitamin B12), or painless white patches on the skin known as vitiligo.

## 4 TREATMENT

### How is Graves' disease treated?

The treatment of hyperthyroidism is described in detail in the [Hyperthyroidism brochure](#). Treatment includes antithyroid drugs (methimazole [Tapazole®]) or propylthiouracil [PTU]), radioiodine, and surgery. Although each treatment has its advantages and disadvantages, most patients will find one that is just right for them. Hyperthyroidism due to Graves' disease is, in general, easily controlled and safely treated, and treatment is almost always successful.

### What will be the outcome of treatment?

No matter how your hyperthyroidism is controlled, you probably will have hypothyroidism someday. Hyperthyroidism tends to lead towards hypothyroidism, probably because of low-grade inflammation within your thyroid gland. Hypothyroidism will occur sooner if your thyroid has been damaged by radioactive iodine or removed in an operation. Even if you are treated with antithyroid drugs alone, hypothyroidism still can occur.

Because of this natural tendency to progress toward hypothyroidism sometime after you have been hyperthyroid, every patient who has ever had hyperthyroidism due to Graves' disease should have blood tests at least once a year to measure thyroid function. Low thyroid hormone levels cause your pituitary gland to produce increased amounts of thyroid-stimulating hormone (TSH). A high TSH blood level is the most sensitive indicator of hypothyroidism, and so your annual thyroid evaluation should always include a TSH test. When hypothyroidism occurs, a thyroid hormone tablet taken once a day can treat it simply and safely (see the [Hypothyroidism brochure](#)).

### Other family members at risk

Because Graves' disease is an inherited condition, examinations of the members of your family may reveal other individuals with thyroid problems.

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