

The thyroid gland can become overactive (hyperthyroidism) or underactive (hypothyroidism). This is most often due to an autoimmune disease in your body.

For more information, visit www.preventblindness.org/thyroid-eye-disease.

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Thyroid Eye Disease

(Also known as Graves' Ophthalmopathy or Graves' Eye Disease)

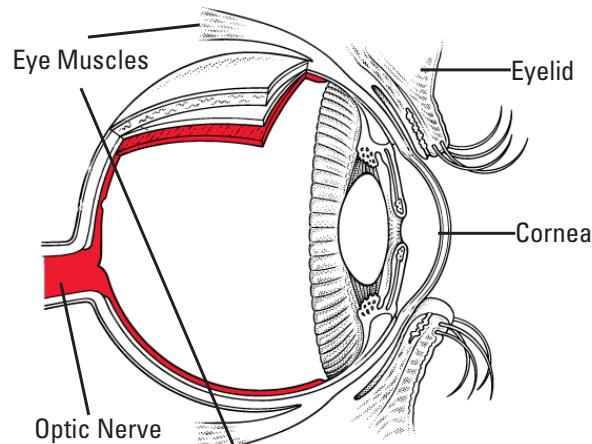
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What is Thyroid Eye Disease?

Thyroid eye disease (TED), sometimes called Graves' ophthalmopathy or Graves' Eye Disease, is an autoimmune disease in which the immune system causes inflammation and swelling and stimulates the production of muscle tissue and fat behind the eye. The overactive thyroid gland (hyperthyroidism) is usually caused by Graves' disease. Up to one-half of people with Graves' disease develop thyroid eye disease. In some people, thyroid eye disease can occur with normal levels of thyroid hormones (euthyroid) or low levels of thyroid hormones (hypothyroidism). Thyroid eye disease may occur in patients who already know they have thyroid disease, or it may be the first sign of Graves' disease. While TED often occurs in people living with hyperthyroidism or Graves' disease, it is a distinct disease and treating hyperthyroidism may not resolve the eye symptoms and signs.

In the “active phase” of thyroid eye disease, the main symptoms include inflammation and increased amounts of the tissue, muscles, and fat behind the eye (in the bony eye socket) causing the eyeballs to bulge out. If the eye is pushed far enough forward, the eyelids may not close properly when blinking and sleeping. The front part of the eye, called the cornea, may become unprotected, dry and, damaged. Also, the enlargement of the tissues and muscles of the eye may prevent it from working well, which affects eye position and eye movements leading to double vision. In severe cases, the inflammation and enlargement of the tissues, muscles, and fat behind the eye compresses the optic nerve, the nerve that connects the eye to the brain, causing vision loss.



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Who is at Risk for Thyroid Eye Disease?

Thyroid eye disease is most commonly associated with Graves' disease. It can also occur with normal thyroid hormone levels or low levels of thyroid hormones (hypothyroidism).

Other risk factors for thyroid eye disease include:

- **Age:** Usually affects middle-age adults but can occur at any age
- **Gender:** Females are affected more than males
- **Family history** of thyroid eye disease
- **Smoking:** Smoking increases the risk of thyroid eye disease by 7–8 times, causes thyroid eye disease to have a longer “active phase”, and it reduces the effectiveness of treatments
- **Radioiodine therapy:** Radioactive iodine has been used to treat hyperthyroidism and Graves' disease. This

treatment should be used with caution in people with active thyroid eye disease as it may worsen the condition unless steroids are given at the same time

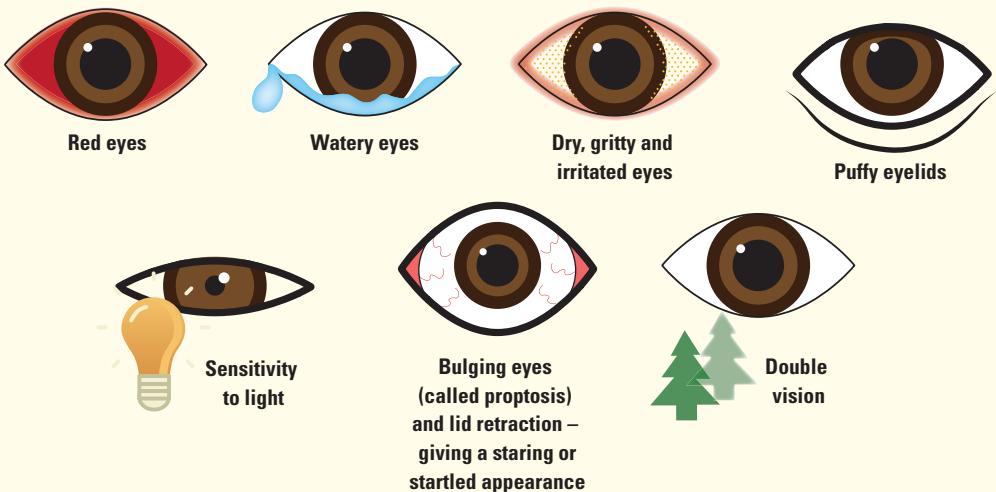
- Low blood levels of **selenium**, a dietary mineral.

What are the Symptoms of Thyroid Eye Disease?

If you have Graves' disease, eye symptoms most often begin within six months of disease diagnosis. Very rarely, eye problems may develop long after the Graves' disease has been treated. In some patients with eye symptoms, hyperthyroidism never develops and, rarely, patients may have hypothyroidism. The severity of the eye symptoms is not related to the severity of the hyperthyroidism.

Symptoms of thyroid eye disease are caused by the tissues, fat, and muscles of the eye socket swelling and pushing the eyeball forward. It may be possible that symptoms may appear in one eye more than the other.

The symptoms of thyroid eye disease include:



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Double vision can be a symptom of Thyroid Eye Disease.

In more advanced thyroid eye disease, there may also be:

- Trouble moving eyes and closing eyes
- Inability to completely close your eye causing a corneal ulcer
- Colors appear to be dull or not as bright
- Blurred or loss of vision due to optic nerve compression or corneal damage

How is Thyroid Eye Disease Diagnosed?

If you have thyroid disease or suspect that you may have thyroid eye disease, your doctor may recommend that you see an eye doctor. Thyroid eye disease is managed by an eye doctor (ophthalmologist). Management of more severe forms of the disease may require a team of eye doctors, including specialists in eye plastic surgery, eye muscle surgery, and neuro-ophthalmology. They will be able to evaluate your symptoms, recommend a course of treatment, discuss surgical options to bring your eyes back to their normal appearance, and help you watch for any problems with decreased vision.

To assess your vision and the changes in the tissues around your eyes, there are several tests you can expect your eye doctor to perform. The following tests are often conducted:

- **Visual acuity** – to determine how well you can see far away and up close

- **Color vision** – to determine how well you see colors
- **Visual fields** – to assess your central and side vision
- **Eye movements** – to see how much your eye muscles have been affected
- **Eyelid measurements** – to measure the eyelid position on the eye
- **Eye measurements** – to measure the amount of eye bulging (protrusion)
- **Eye pressure readings** – to determine the pressure inside the eye
- **Optic nerve visualization** – to look into the back of your eye to see if the optic nerve is affected
- **Magnetic resonance imaging (MRI) scan or computed tomography (CT) scan** – to see how much enlargement there is in the tissue and muscles behind the eye

How is Thyroid Eye Disease Treated/Managed?

Thyroid eye disease in its active phase can last between one and three years. That means if it is left untreated, the inflammation may gradually decrease by itself but may cause damage to vision through the course of the disease. Sometimes, the changes caused by the enlargement of the tissues (such as bulging eyes or double vision) may not go away. The goal of treatment is to limit inflammation

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and swelling occurring during the active or inflammatory phase and to protect the front of the eye and prevent vision loss.

Thyroid eye disease is managed by a specialist eye doctor (ophthalmologist). Any underlying thyroid problems will be managed by your primary care doctor (PCP) or by a specialist in the hormone systems of the body (an endocrinologist).

If a thyroid issue is suspected, evaluation and treatment are critical. The first priority is to restore your normal thyroid function. In addition, eye conditions should be examined and treated at the same time as your thyroid gland treatment. Eye problems may continue to progress even after your thyroid function returns to normal.

What Can I Do to Help My Vision?

If you have thyroid eye disease, your eye doctor may recommend one or more of the following treatments to help soothe your eyes and improve your vision:

- **Cool compresses:** Apply cool compresses to your eyes. The extra moisture and cooling effect may provide relief.
- **Sunglasses:** When you have thyroid eye disease, your eyes are more sensitive to sunlight and UV rays. Wearing sunglasses helps protect them from both sun and wind.
- **Lubricating eye drops:** Use lubricating eye drops, like artificial tears. It may help relieve dryness and

scratchiness. Make sure to use eye drops that do not contain redness removers. Lubricating gels can be used before bed to prevent the cornea (the front of the eye) from drying out because your eyelids may not close completely when sleeping.

Note: If you have difficulty closing your eyelids, you may be at risk to develop a corneal ulcer. The cornea is a clear layer that covers the front of the eye. A corneal ulcer is an open sore on your cornea and it can cause scarring and permanent loss of the vision. A corneal ulcer causes redness of the eye, pain and usually a decrease in vision. You should seek immediate attention from your eye doctor for these problems.

- **Taping:** Talk with your doctor about taping your eyelids together to help protect your front of your eye (cornea) from drying when your eyelids do not close completely during sleep.
- **Elevate your head when laying down:** Keeping your head higher than the rest of your body may reduce swelling and may help relieve pressure on your eyes.
- **Quit smoking:** Smoking (and second hand exposure to smoke) is an important risk factor for thyroid eye disease. If you smoke, quit, and avoid second hand smoke.

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- **Steroids:** Swelling in your eyes may be improved by treatment with steroids (such as hydrocortisone or prednisone). Your doctor may recommend either intravenous or oral medication. Note, make sure you discuss the risks of use of steroids with your doctor before use.
- **Selenium supplements:** Recent studies suggests that patients with mild active thyroid eye disease may benefit from selenium supplements. Talk to your doctor before starting supplements.
- **Prisms:** Thyroid eye disease can cause scar tissue to develop in your eye muscles. This can lead them to become short and pull your eyes out of alignment, causing double vision. If double vision occurs, glasses containing prisms may be prescribed by your doctor. However, prisms do not work for all people with double vision and your doctor may recommend patching one eye for temporary relief or eye muscle surgery as a more effective option when changes have stabilized.
- **Eyelid surgery:** When you have thyroid eye disease, the eyelids are usually more widely open with a “startled look” because the muscles in the eyelids may tighten and pull the upper lid up and the lower lid down. You may have difficulty closing your eyelids, leaving the front of the eye (cornea) more exposed, which causes tearing, irritation and susceptible to developing a corneal ulcer. Eyelid surgery may help reduce exposure of the cornea.
- **Eye muscle surgery:** Eye muscle surgery may help correct your double vision by moving the affected muscle farther back from its original position on the eyeball. This surgery will help to correct your double vision when reading and looking straight ahead. Sometimes, you may need more than one surgery to get effective results.
- **Orbital decompression surgery:** Thyroid eye disease can cause swollen tissues around the eye that compresses the optic nerve. The optic nerve provides the connection between your eye and the brain. When the nerve is compressed, color vision becomes abnormal, lights may seem dimmer than usual, and the sharpness of the vision decreases. Orbital decompression surgery can be done to improve your vision. The surgery makes the eye socket bigger or removes some of the excess tissue. When the nerve is compressed, the goal of surgery is to get the eye and the inflamed tissue more space and decreases pressure on the optic nerve. Even when the optic nerve

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function is not compromised, orbital decompression may be used to restore comfort and appearance by reducing the bulging of the eyes. If orbital decompression surgery is recommended, it is usually performed prior to eye muscle surgery and/or eyelid surgery, if needed.

- **New treatments:** There is an intravenous infusion (putting drugs into a vein) treatment that is the first FDA-approved medication for the treatment of thyroid eye disease.

Your eye doctor will require some time for your thyroid eye disease to stabilize before recommending surgery. Typically, the active or inflammatory stage of thyroid eye disease lasts one to three years. During this time, your eye doctor will avoid surgically treating your symptoms unless your vision is threatened. In cases such as a corneal ulcer or optic nerve compression urgent surgery may be recommended.

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