

Thyroid Eye Disease

(Also Known as Graves' Ophthalmopathy or Graves' Orbitopathy)

WHAT IS THE THYROID GLAND?

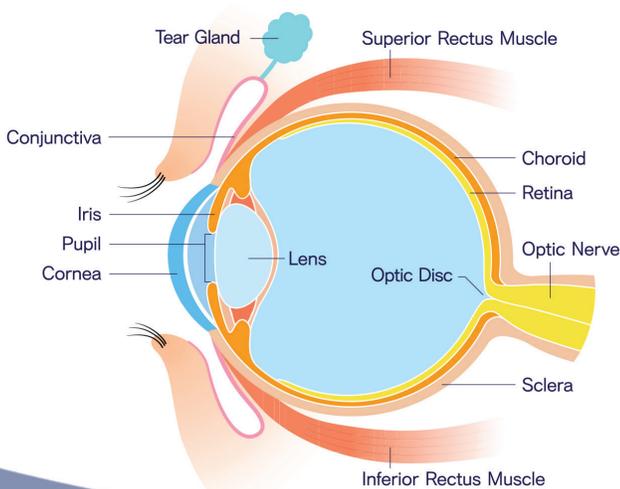
Your thyroid gland is a butterfly-shaped gland that is located in the lower front of your neck. The job of your thyroid gland is to make thyroid hormones. Thyroid hormones are released into your blood and carried to every tissue in your body. Thyroid hormones help your body use energy, stay warm and keep your brain, heart, muscles, and other organs working normally.

WHAT IS THYROID EYE DISEASE?

Thyroid eye disease (abbreviated as TED) is an autoimmune disease that affects some people with autoimmune thyroid disease. TED is most common in people with hyperthyroidism due to [Graves' disease](#) and rarely, may occur in patients with normal or low thyroid levels.

- About one in every three people with Graves' disease develop eye symptoms.
- While eye symptoms can occur at any time, they usually appear within the first year of diagnosis of Graves' disease.
- TED is usually mild and gets better on its own over time.
- Some cases can be quite severe and can require medications or surgery.

It may be helpful for you to first understand more about the tissues and structures that surround your eye.



- Each of your eyes has four main muscles. One muscle is attached to each side of the eyeball. These muscles allow you to move your eyes to look in different directions.
- Your eyeballs and muscles are cushioned by fatty tissue. These are surrounded by bone (your eye sockets) on all sides except the front.
- Within your eye sockets there are also blood vessels and nerves. These feed and support your eye tissues.
- Each eye has an optic nerve which is critical for your vision. The optic nerve helps connect your eye to your brain to register what you see.

In TED, your body makes antibodies which attack soft tissues (the cushion of fatty tissue and the eye muscles) around your eyeball and cause them to swell up and enlarge (thicken). This can result in changes to how your eyes look and feel and how well you see.

- The swelling causes pressure on the tissues within your eye socket squeezing the muscles, blood vessels and nerves.
 - If your eye muscles are swollen and tight, they cannot move your eyes normally. This can result in double vision. Your eyes can look red and puffy ("congested")
 - If your optic nerve is compressed, signals from the eye to the brain can be blocked and cause loss of vision. This is an emergency and needs immediate treatment.
- The swelling can also push the eye forward toward the front opening of your eye socket
- As your eyeball is pushed forward, this can cause your eyes to look bigger or cause bulging of your eyes (called "proptosis").
- Your eyelids can be pulled open more than usual. This can cause you to look like you are staring. You might not be able to completely close your eyelids.
 - The open eyelids can also cause your eyes to feel dry and cause extra tearing of your eyes.

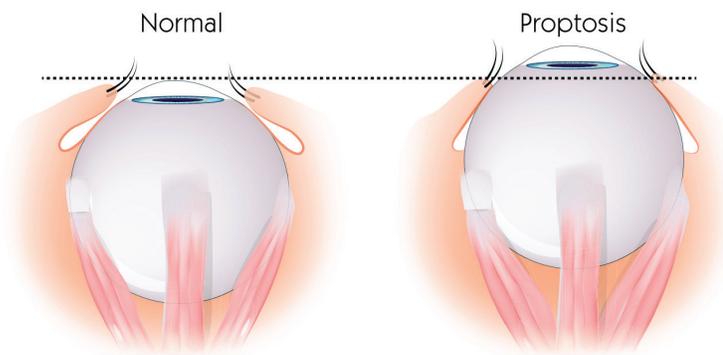
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WHAT ARE THE SYMPTOMS OF THYROID EYE DISEASE?

Symptoms of thyroid eye disease include:

- Feeling of grittiness in your eyes (like “sand in your eyes”) and sensitivity to light
- Pain behind your eyes or with eye movement
- Redness of the eyes due to swelling/irritation of the thin coating (conjunctiva) that covers the white part of the eyes
- Dry eyes
- Extra tearing of the eyes
- Puffy or red eyelids
- Forward bulging of your eyes (proptosis)
- Seeing double (Double vision)



If you notice any of these symptoms of more serious eye disease, contact your doctor immediately.

- If your eyelids cannot close fully due to TED, the outer surface of your eyeball can be injured.
- If you notice a change in how you see colors
- If parts of your field of vision are lost (this can happen if your optic nerve is compressed.)

HOW IS TED DIAGNOSED?

The diagnosis of thyroid eye disease (TED) can be made by your primary care physician, your thyroid doctor/endocrinologist, or your eye doctor (ophthalmologist). This usually occurs when you tell them about your symptoms, and they examine your eyes. You may also need additional testing such as

- Measurement of the amount of bulging of your eye
- Tests to check your visual field, and color vision
- A computed tomography (CT) scan or magnetic resonance imaging (MRI) scan of your eye sockets and eye muscles

MONITORING

If the symptoms and/or eye changes from TED are moderate-to-severe or if the diagnosis or severity is uncertain, you should be referred to an ophthalmologist (eye doctor).

PREVENTION

More research on TED is needed to better understand why some people get it and others do not. However, research has identified some factors that can make it more likely for TED to develop or get worse.

- Exposure to cigarette smoke, even secondhand smoke
 - If you smoke, you should try to quit.
 - You should avoid all cigarette smoke including secondhand smoke
 - Having abnormal thyroid hormone levels (high or low) can make your eye disease worse. You can work with your doctor to keep your thyroid hormone levels in the normal range.
- Treatment of your overactive thyroid with **radioactive iodine (RAI)**, especially in people who also smoke and/or people who already have TED.
 - Your doctor will usually suggest you avoid treatment with RAI if you have moderate or severe eye symptoms.
 - However, if RAI is the best treatment for you, your doctor may discuss giving you a steroid medicine at the time of the RAI treatment. This can prevent your eye disease from getting worse.



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HOW IS THYROID EYE DISEASE TREATED?

If you have TED, there is good treatment available. There are some non-medication treatments you can use yourself, other treatments should be recommended or prescribed by your doctor, and sometimes surgery is needed.

Non-medication treatments you can use:

- Wear sunglasses if your eyes are more sensitive to sunlight. Wearing sunglasses helps protect your eyes from both sun and wind. Sunglasses with a wrap-around design offer the best protection.
- Use lubricating eyedrops. Eyedrops, such as artificial tears, may help relieve dryness and scratchiness. Be sure to use eyedrops that are for lubrication. Check with your doctor if you aren't sure what type of eyedrops to use.

- A lubricating gel can be used before bed if your eyelids do not close completely. This will prevent your cornea (the outer layer of your eye) from drying out while you are sleeping.
- Raise the head of your bed. Keeping your head higher than the rest of your body may relieve pressure on your eyes. This can help reduce swelling and puffiness.
- Prisms. If double vision is a problem, glasses containing prisms may be prescribed by your eye doctor.

MEDICATIONS:

Your doctor may recommend a medication. You and your doctor should review all possible side effects and the potential benefits before considering a medicine. Newer medicines are being investigated to see if they will help TED.

CURRENT MEDICATION OPTIONS FOR THYROID EYE DISEASE

MEDICATION	HOW IS MEDICATION GIVEN?	WHAT DOES THIS MEDICINE IMPROVE?	SIDE EFFECTS
Selenium	By mouth	Mild eye symptoms	High levels can cause diarrhea, nausea, brittle nails, irritability, and skin rashes
Steroids	Intravenous (injection)	Swelling of the eyes	Some people using this medication experience changes in mood, difficulty sleeping, and changes in blood pressure or blood sugar
Teprotumumab	Intravenous (infusion)	Irritation and bulging of the eye May reduce the need for surgery	Some people using this medication experience: high blood sugars, decreased hearing, gastro-intestinal symptoms, and muscle cramps. Cannot be used during pregnancy or breastfeeding.



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EYE SURGERY:

- Surgery is required in only a small number of patients with TED.
- Usually, surgery is planned when your eye symptoms have reached the inactive phase. Inactive means that your eye symptoms are stable. They are not getting worse or better.
- Very rarely, emergency surgery is needed if you have any vision loss.
- You may need more than one type of eye surgery. If so, your ophthalmologist will let you know the best timing and order for the different procedures.
- Several types of ophthalmologists may be needed. All TED surgeries should be done at a medical center that specializes in the type of surgery you need.

ORBITAL DECOMPRESSION SURGERY:

If your eyesight is in danger and/or you have significant eye bulging, a type of surgery called orbital decompression can be done.

- In this procedure, bone in the wall of your eye socket (orbit) is removed. Also, fat can be removed from the eye socket to allow more space for the swollen tissues.
- This procedure provides room for your eyes to return to their normal position. It can also improve your vision if there is compression of the optic nerve.
- There is a risk of complications. This can include double vision.
 - ▲ If you have double vision before the surgery, it may still be a problem after the surgery.
 - ▲ You might develop new double vision after surgery.
- Most of the time this type of surgery is not scheduled until the inactive phase of your symptoms is reached. However, emergency orbital decompression can be done if compression of the optic nerve is reducing your vision and you have not responded to medical therapy such as steroids.

EYE MUSCLE (STRABISMUS) SURGERY:

Sometimes scar tissue and other changes in your eyes can cause one or more eye muscles to be too short or too tight. This pulls your eyes out of alignment, leading to double vision.

- Eye muscle surgery may help correct double vision. The affected muscle is detached from your eyeball and reattached so that your eyes move together.

In some cases, you may need more than one operation to improve double vision.

EYELID SURGERY:

Eyelids can be retracted, leaving your eyes more widely open. This can cause you to have difficulty closing your eyelids. This leaves your eyeballs more exposed, causing excessive tear production and irritation.

- Surgical repositioning of your eyelid may help reduce the irritation.



When to Call a Professional?

Call a doctor if you:

- notice changes in the appearance of your eyes, such as redness or bulging
- develop any of the symptoms of thyroid eye disease, see above
- notice changes in your ability to see colors
- experience vision loss or a reduction in the quality of your vision.