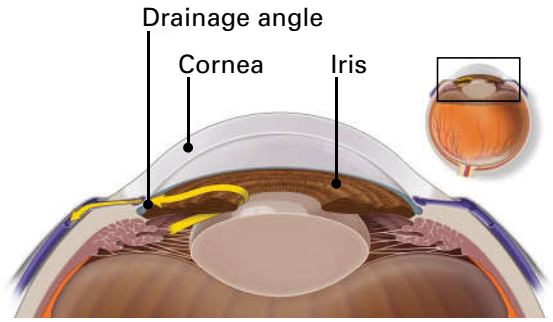
Glaucoma

What is glaucoma?

Glaucoma is a disease that damages your eye's optic nerve. It usually happens when fluid builds up in the front part of your eye. That extra fluid increases the pressure in your eye, damaging the optic nerve.

Glaucoma is a leading cause of blindness for people over 60 years old. But blindness from glaucoma can often be prevented with early treatment.



In a healthy eye, fluid leaves the eye through the drainage angle, keeping pressure stable.

What causes glaucoma?

Your eye constantly makes aqueous humor. As new aqueous flows into your eye, the same amount should drain out. The fluid drains out through an area called the drainage angle. This process keeps pressure in the eye (called intraocular pressure or IOP) stable. But if the drainage angle is not working properly, fluid builds up. Pressure inside the eye rises, damaging the optic nerve.

The optic nerve is made of more than a million tiny nerve fibers. It is like an electric cable made up of many small wires. As these nerve fibers die, you will develop blind spots in your vision. You may not notice these blind spots until most of your optic nerve fibers have died. If all of the fibers die, you will become blind.

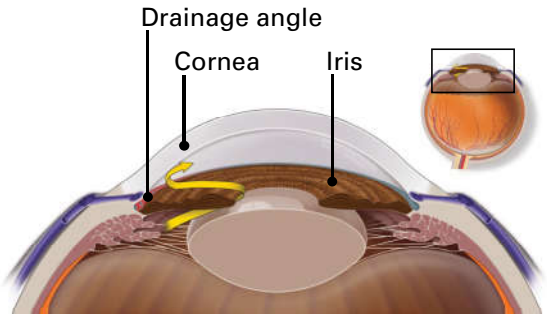
Eye Words to Know

Optic nerve: A nerve at the back of your eye that connects to your brain. The optic nerve sends light signals to your brain so you can see.

Aqueous humor: Clear liquid inside the front part of our eyes. Aqueous is different from tears. It nourishes the eye and keeps its shape.

Drainage angle: The area of the eye where the aqueous humor drains from the front of the eye.

Iris: The colored part of your eye. It controls the size of your pupil to let light into your eye.



If the drainage angle is blocked, fluid cannot flow out of the eye, causing pressure to increase.

Types of glaucoma

There are two major types of glaucoma.

Primary open-angle glaucoma. This is the most common type of glaucoma. It happens gradually, where the eye does not drain fluid as well as it should (like a clogged drain). As a result, eye pressure builds and starts to damage the optic nerve. This type of glaucoma is painless and causes no vision changes at first.

Some people can have optic nerves that are sensitive to **normal** eye pressure. This means their risk of getting glaucoma is higher than normal. Regular eye exams are important to find early signs of damage to their optic nerve.

Angle-closure glaucoma (also called "closed-angle glaucoma" or "narrow-angle glaucoma"). This type happens when someone's iris is very close to the drainage angle in their eye. The iris can end up blocking the drainage angle. You can think of it like a piece of paper sliding over a sink drain. When the drainage angle gets completely blocked, eye pressure rises very quickly. This is called an **acute attack**. It is a true eye emergency, and you should call your ophthalmologist right away or you might go blind.

Here are the signs of an acute angle-closure glaucoma attack:

- Your vision is suddenly blurry
- You have severe eye pain
- You have a headache
- You feel sick to your stomach (nausea)
- You throw up (vomit)
- You see rainbow-colored rings or halos around lights

Many people with angle-closure glaucoma develop it slowly. This is called chronic angle-closure glaucoma. There are no symptoms at first, so they don't know they have it until the damage is severe or they have an attack.

Angle-closure glaucoma can cause blindness if not treated right away.

How is glaucoma diagnosed?

The only sure way to diagnose glaucoma is with a complete eye exam. A glaucoma screening that only checks eye pressure is not enough to find glaucoma.

During a glaucoma exam, your ophthalmologist will:

- measure your eye pressure
- inspect your eye's drainage angle
- examine your optic nerve for damage
- test your peripheral (side) vision
- take a picture or computer measurement of your optic nerve
- measure the thickness of your cornea

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Content last reviewed 03/19

Visual field testing is used to monitor peripheral, or side, vision

Who is at risk for glaucoma?

Some people have a higher than normal risk of getting glaucoma. This includes people who:

- are over age 40
- have family members with glaucoma
- are of African, Hispanic or Asian heritage
- have high eye pressure
- are farsighted or nearsighted
- have had an eye injury
- use long-term steroid medications
- have corneas that are thin in the center
- have thinning of the optic nerve
- have diabetes, high blood pressure, migraines, poor blood circulation or other health problems affecting the whole body

Talk with an ophthalmologist about your risk for getting glaucoma. People with more than one of these risk factors have an even higher risk of glaucoma.

How is glaucoma treated?

Glaucoma damage is permanent—it cannot be reversed. But medicine and surgery help to stop further damage. To treat glaucoma, your ophthalmologist may use one or more of the following treatments.

Medication. Glaucoma is usually controlled with eyedrop medicine. Used every day, these eye drops lower eye pressure. Some do this by reducing the amount of aqueous fluid the eye makes. Others reduce pressure by helping fluid flow better through the drainage angle.

Glaucoma medications can help you keep your vision, but they may also produce side effects. Some eye drops may cause:

- a stinging or itching sensation
- red eyes or red skin around the eyes
- changes in your pulse and heartbeat
- changes in your energy level
- changes in breathing (especially if you have asthma or breathing problems)
- dry mouth
- blurred vision
- eyelash growth
- changes in your eye color, the skin around your eyes or eyelid appearance.

All medications can have side effects. Some drugs can cause problems when taken with other medications. It is important to give your doctor a list of every medicine you take regularly. Be sure to talk with your ophthalmologist if you think you may have side effects from glaucoma medicine.

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Never change or stop taking your glaucoma medications without talking to your ophthalmologist. If you are about to run out of your medication, ask your ophthalmologist if you should have your prescription refilled.

Laser surgery. There are two main types of laser surgery to treat glaucoma. They help aqueous drain from the eye. These procedures are usually done in the ophthalmologist's office or an outpatient surgery center.

- **Trabeculoplasty.** This surgery is for people who have open-angle glaucoma. The eye surgeon uses a laser to make the drainage angle work better. That way fluid flows out properly and eye pressure is reduced.
- **Iridotomy.** This is for people who have angle-closure glaucoma. The ophthalmologist uses a laser to create a tiny hole in the iris. This hole helps fluid flow to the drainage angle.

Operating room surgery. Some glaucoma surgery is done in an operating room. It creates a new drainage channel for the aqueous humor to leave the eye.

- **Trabeculectomy.** This is where your eye surgeon creates a tiny flap in the sclera (white of your eye). He or she will also create a bubble (like a pocket) in the conjunctiva called a filtration bleb. It is usually hidden under the upper eyelid and cannot be seen. Aqueous humor will be able to drain out of the eye through the flap and into the bleb. In the bleb, the fluid is absorbed by tissue around your eye, lowering eye pressure.
- **Glaucoma drainage devices.** Your ophthalmologist may implant a tiny drainage tube in your eye. It sends the fluid to a collection area (called a reservoir). Your eye surgeon creates this reservoir beneath the conjunctiva (the thin membrane that covers the inside of your eyelids and white part of your eye). The fluid is then absorbed into nearby blood vessels.

Glaucoma is a silent thief of sight.

Glaucoma has no symptoms in its early stages. In fact, half the people with glaucoma do not know they have it! Having regular eye exams can help your ophthalmologist find this disease before you lose vision. Your ophthalmologist can tell you how often you should be examined.

Your role in glaucoma treatment

Treating glaucoma successfully is a team effort between you and your doctor. Your ophthalmologist will prescribe your glaucoma treatment. It is up to you to follow your doctor's instructions and use your eye drops.

Once you are taking medications for glaucoma, your ophthalmologist will want to see you regularly. You can expect to visit your ophthalmologist about every 3–6 months. However, this can vary depending on your treatment needs.

If you have any questions about your eyes or your treatment, talk to your ophthalmologist.

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Summary

Glaucoma is a disease that affects the eye's optic nerve. This nerve becomes damaged when pressure inside the eye builds up from too much fluid. When the optic nerve is damaged, it can cause blindness.

Ophthalmologists treat glaucoma with medicine and surgery. Because glaucoma has no symptoms, it is important to see your ophthalmologist regularly, who will check for eye and vision changes.

If you have any questions about your eyes or your vision, speak with your ophthalmologist. He or she is committed to protecting your sight.

Watch a glaucoma video from the American Academy of Ophthalmology's EyeSmart program at **aao.org/glaucoma-link**.

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Content last reviewed 03/19