

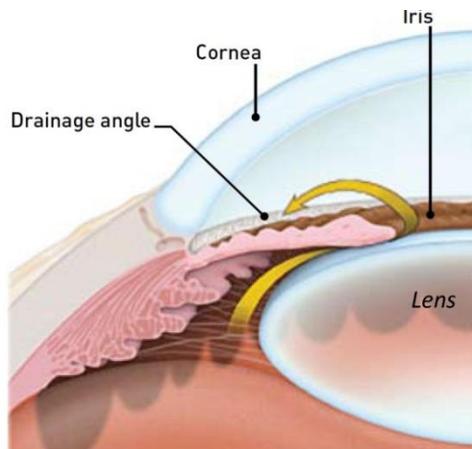
# GLAUCOMA

## **What is glaucoma?**

Glaucoma is a disease of the optic nerve, caused by an abnormally high pressure in the eye. The optic nerve is made up of over a million nerve fibers. It carries the images from the eye to the brain. When damage to optic nerve fibers occurs, blind spots develop. These blind spots usually go undetected until the optic nerve is significantly damaged. If the entire nerve is destroyed, blindness results. Early detection and treatment are the keys to preventing optic nerve damage. Glaucoma is a leading cause of blindness in the United States, especially for older people. But loss of sight from glaucoma can be prevented with early treatment.

## **What causes high pressure in the eye?**

A clear liquid, called aqueous, circulates inside the front part of the eye. To maintain a healthy level of pressure within the eye, a small amount of aqueous is produced constantly. Aqueous flows out of the eye through a microscopic drainage system. If the drainage system is backed up or blocked, pressure within the eye increases. Increased pressure against the optic nerve damages it.



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

## **What are the different types of glaucoma?**

### **Chronic open-angle glaucoma:**

This is the most common form of glaucoma. The risk of developing chronic open-angle glaucoma increases with age. The drainage system of the eye becomes less efficient over time, and pressure in the eye gradually increases. Increased pressure damages the optic nerve. Typically, open-angle glaucoma causes no symptoms in its early stages. As the optic nerve becomes damaged, blank spots begin to appear in your field of vision. You typically won't notice these blank spots in your daily activities until the optic nerve is significantly damaged. If almost all the optic nerve fibers die, blindness will result.

### **Closed-angle glaucoma:**

The drainage system of the eye is often referred to as the drainage angle. It is located inside the eye, in the angle formed by the cornea (the clear window in the front of the eye) and the base of the iris (the colored part of the eye). In some eyes the iris is too close to the drainage angle of the eye. These eyes are described as having narrow angles. (These eyes are usually small in size and are common in farsighted people.) In these eyes the iris can be pushed forward, blocking the drainage angle. When this happens, pressure builds up inside the eye, causing closed-angle glaucoma. Chronic closed-angle glaucoma is seen when the drainage angle is only partially blocked. Chronic closed-angle glaucoma is similar to chronic open-angle glaucoma, but it can progress more rapidly and the treatment is somewhat different.

If the drainage angle is completely blocked, pressure rapidly increases within the eye. This causes an acute closed-angle attack of glaucoma.

Symptoms of an acute closed-angle attack may include:

- blurred vision;
- severe eye pain;
- headache;
- rainbow-colored halos around lights;
- nausea and vomiting.

An attack of acute closed-angle glaucoma is an eye emergency. Unless this type of glaucoma is treated quickly, blindness can result. Chronic closed-angle glaucoma can precede an acute closed-angle attack.

### **Who is at risk for glaucoma?**

Your ophthalmologist considers many kinds of information to determine your risk for developing glaucoma. The most important risk factors include:

- age;
- elevated eye pressure;
- family history of glaucoma;
- African ancestry;
- farsightedness or nearsightedness;
- past eye injuries;
- central corneal thickness;
- systemic health problems, including diabetes, migraine headaches, and poor circulation;
- pre-existing thinning of the optic nerve.

Your ophthalmologist will weigh all of these factors before deciding if you need treatment for glaucoma or if you should be monitored closely as a “glaucoma suspect”. A person diagnosed as a glaucoma suspect is at risk for developing glaucoma and needs to have regular examinations.

### **How is glaucoma detected?**

Having regular eye examinations by your ophthalmologist is the best way to detect glaucoma. Checking only the pressure of the eye is not sufficient to determine if you have glaucoma.

During your glaucoma evaluation, your ophthalmologist will:

- measure your intraocular pressure (**tonometry**);
- inspect the drainage angle of your eye (**gonioscopy**);
- evaluate whether or not there is any optic nerve damage (**ophthalmoscopy**);
- test the peripheral vision of each eye (**visual field testing**, also called **perimetry**).

Imaging and laser scanning of the optic nerve may also be recommended.

Some of these tests may not be necessary for everyone. These tests may need to be repeated on a regular basis to monitor any changes in your condition.

## How is glaucoma treated?

Damage caused by glaucoma cannot be reversed. Eye drops, in-office laser surgery, and surgery in an operating room are used to lower eye pressure and prevent damage. With any type of glaucoma, periodic examinations are important. Because glaucoma can progress without your knowledge, adjustments to your treatment may be necessary from time to time.

**Medications:** Glaucoma is usually controlled with eye drops. The drops must be used once or several times every day. These medications lower eye pressure, either by decreasing aqueous production within the eye or by improving the flow through the drainage angle. Glaucoma medications can preserve your vision, but they can cause side effects. The side effects are usually related to your medical history. If you experience a side effect from a particular glaucoma drop, it can generally be exchanged for one that is better tolerated.

Eye drops used to treat glaucoma can cause:

- a stinging or itching sensation;
- red eyes or redness of the skin surrounding the eyes;
- changes in pulse and heartbeat;
- changes in energy level;
- changes in breathing (especially with asthma or emphysema);
- dry mouth;
- eyelash growth;
- blurry vision.

**Laser surgery:** Laser surgery may be recommended to treat your glaucoma.

- In open-angle glaucoma, the drain itself is treated. A Selective Laser Trabeculoplasty is the laser procedure of choice for this purpose. It modifies the drain to reduce the eye pressure.
- In closed-angle glaucoma, a YAG laser iridotomy is performed. This laser procedure creates a tiny hole in the iris to permit the flow of aqueous into the drain.

Laser surgery for glaucoma is performed in the office, with the patient in the examining chair. No preparation, other than eye drops, is necessary. The procedures are painless, take almost no time to perform, and generally entail no risk. Normal activities may be resumed immediately after the treatment. Laser procedures for glaucoma can be repeated if necessary. Often laser surgery eliminates the need for eye drops.

**Surgery in the operating room:** When actual surgery is needed to treat glaucoma, a new drainage channel for the aqueous fluid is created. Surgery is recommended if medications and laser therapy do not adequately lower the pressure in the eye. The surgery is performed as an outpatient procedure.

**What is your part in treatment?** Treatment for glaucoma requires teamwork between you and your doctor. Your ophthalmologist can prescribe a treatment for glaucoma, but only you can make sure that you follow it. Eye drops work only when they are used every day as prescribed. When you are taking medications for glaucoma, you still need to be seen regularly. Typically, you can expect to visit your ophthalmologist at least every six months. This will vary depending on your treatment needs.