

GLAUCOMA

American Academy of Ophthalmology

What is glaucoma?

Glaucoma is a disease of the optic nerve, which is the part of the eye that carries the images we see to the brain. The optic nerve is made up of many nerve fibers, like an electrical cable containing numerous wires. When damage to the 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 by your ophthalmologist (Eye M.D.) are the keys to preventing optic nerve damage and blindness from glaucoma.

Glaucoma is the leading cause of blindness in the United States, especially for older people. But loss of sight from glaucoma can often be prevented with early treatment.

What causes glaucoma?

Clear liquid, called the aqueous humor, circulates inside the front portion of the eye. A small amount of this fluid is produced constantly, and an equal amount flows out of the eye through a microscopic drainage system, maintaining a constant level of pressure within the eye. (This liquid is not part of the tears on the outer surface of the eye.)

Because the eye is a closed structure, if the drainage area for the aqueous humor-called the drainage angle-is blocked, the excess fluid cannot flow out of the eye. Fluid pressure within the eye will increase, pushing against the optic nerve and potentially causing damage.

What are the different types of glaucoma?

Chronic open-angle glaucoma: This is the most common form of glaucoma in the United States.

The risk of developing chronic open-angle glaucoma increases with age. The drainage angle of the eye becomes less efficient over time, and pressure within the eye gradually increases, which can damage the optic nerve. In some patients, the optic nerve becomes sensitive to normal eye pressure and is at risk for damage. Treatment is necessary to prevent further vision loss.

Chronic open-angle glaucoma damages vision so gradually and painlessly that you are not aware of trouble until the optic nerve is already injured.

Closed- angle glaucoma: Sometimes the drainage angle of the eye may become completely blocked. In the eye, the iris (the part that makes eyes blue, brown, or green) may drop over and completely close off the drainage angle. You can imagine this occurring much like a sheet of

paper floating near a drain. If the paper suddenly drops over the opening the flow is abruptly blocked.

When eye pressure builds up suddenly, an **acute closed-angle glaucoma attack** occurs.

Symptoms may include:

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

This is a true eye emergency. If you have any of these symptoms, call your ophthalmologist immediately. Unless this type of glaucoma is treated quickly, blindness can result.

In some patients, glaucoma has features of both the chronic open-angle type and the acute closed-angle type. This may be called chronic closed-angle glaucoma or mixed mechanism glaucoma.

Who is at risk for glaucoma?

Your ophthalmologist considers many kinds of information to determine your risk for developing the disease.

The most important risk factors include:

- age;
- elevated eye pressure;
- family history of glaucoma;
- African ancestry;
- nearsightedness;
- past eye injuries;
- diabetes

Your ophthalmologist will weigh all of these factors before deciding whether you need treatment for glaucoma, or whether you should be monitored closely as a glaucoma suspect. This means your risk for developing glaucoma is higher than normal, and you need to have regular examinations to detect the early signs of damage to the optic nerve.

How is glaucoma detected?

Regular eye examinations by your ophthalmologist are the best way to detect glaucoma. A glaucoma screening that checks only the pressure of the eye is not sufficient to determine if you have glaucoma. The only sure way to detect glaucoma is to have a complete eye examination.

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, or perimetry**).

Photography of the optic nerve or other computerized imaging may 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 for any changes in your condition.

How is glaucoma treated?

As a rule, damage caused by glaucoma cannot be reversed. Eyedrops, laser surgery and surgery in the operating room are methods used to help prevent further damage. In some cases, oral medications may also be prescribed.

With and type of glaucoma, periodic examinations are very important to prevent vision loss. Because glaucoma can progress without your knowledge, adjustments to your treatment may be necessary from time to time.

Medications

Glaucoma is usually controlled with eyedrops taken on a daily basis. These medications decrease eye pressure, either by slowing the amount of aqueous fluid produced within the eye or by improving the flow through the drainage angle.

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

Glaucoma medications can preserve your vision, but they may also produce side effects. You should notify your ophthalmologist if you think you may be experiencing side effects.

Some eyedrops may cause:

- a stinging 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;
- changes in sense of taste;
- headaches;
- blurred vision;
- changes in eye color;

All medications can have side effects or can interact with other medications. Therefore, it is important that you make a list of the medications you regularly take and share this list with each doctor you see.

Laser surgery

Laser surgery treatment may be recommended for different types of glaucoma.

In open-angle glaucoma, the drain itself is treated. The laser is used to modify the drain (**trabeculoplasty**) to help control the eye pressure. In closed-angle glaucoma, the laser creates a hole in the iris (**iridotomy**) to improve the flow of aqueous to the drain.

Surgery in the operating room

When surgery in the operating room is needed to treat glaucoma, your ophthalmologist uses fine, microsurgical instruments to create a new drainage channel for aqueous fluid to leave the eye. Should this type of surgery be necessary, your ophthalmologist can provide you with information about this procedure. As with laser surgery, surgery in the operating room is typically an outpatient procedure.

There are risks with all types of surgery. Though serious complications of modern glaucoma surgery are uncommon, they can occur. Surgery is recommended if your ophthalmologist feels that it is necessary to prevent further damage to the optic nerve.

What is your part in treatment?

Treatment for glaucoma requires teamwork between you and your doctor. Your ophthalmologist can prescribe treatment for glaucoma, but only **you** can make sure that you follow your doctor's instruction and take your eyedrops.

Once you are taking medications for glaucoma, your ophthalmologist will want to see you more frequently. Typically, you can expect to visit your ophthalmologist every three to four months. This will vary depending on your treatment needs.

Loss of vision can be prevented

Regular medical eye exams may help prevent unnecessary vision loss. Recommended intervals for eye exams are:

- Age 20-39: Individuals of African descent or with a family history of glaucoma should have a medical exam every 3 to 5 years. Others can be seen at least once during this period;
- Age 40-64: Every 2 to 4 years;
- Age 65 or older: Every 1 to 2 years.

Resources

For more information, please contact:

The American Academy of Ophthalmology (www.aaopt.org)

The Glaucoma Foundation

116 John Street, Suite 1605

New York, NY 10038

Phone: 1-800-GLAUCOMA (1-800-452-8266)

www.glaucoma-foundation.org

Research to Prevent Blindness

645 Madison Avenue

New York, NY 10022-1010

Phone: 1-800-621-0026

www.rpbusa.org

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