

# Glaucoma

Glaucoma is a group of eye diseases in which the normal fluid pressure inside the eyes slowly rises, leading to vision loss or even blindness. Open-angle glaucoma is the most common form of the disease.

Glaucoma is a leading cause of blindness in the United States. Although anyone can get glaucoma, African Americans, Mexican Americans, anyone over the age of 60 and people with a family history of glaucoma are at higher risk. There is no cure for glaucoma, but early treatment can often help protect the eyes against serious vision loss.

## Types of Glaucoma

Open-angle glaucoma is the most common form of glaucoma, making up an estimated 80 percent of all glaucoma cases. In the front of the eye is a space called the anterior chamber; a clear fluid flows continuously in and out of the chamber and nourishes nearby tissues. The fluid leaves the chamber at the open angle where the cornea and iris meet. When the fluid reaches the angle, it flows through a spongy meshwork, like a drain, and leaves the eye. Open-angle glaucoma occurs when the liquid flowing through the eye becomes blocked, causing the pressure inside the eye to increase.

Other types of the disease include:

- **Low-tension glaucoma:** In low-tension or normal-tension glaucoma, optic nerve damage and narrowed side vision occur in people with normal eye pressure. Lowering eye pressure at least 30 percent through medicines slows the disease in some people. Glaucoma may worsen in others despite low pressures. A comprehensive medical history is important in identifying other potential risk factors, such as low blood pressure, that contribute to low-tension glaucoma. If no risk factors are identified, the treatment options for low-tension glaucoma are the same as for open-angle glaucoma.
- **Angle-closure glaucoma:** In angle-closure glaucoma, the fluid at the front of the eye cannot reach the angle and leave the eye. The angle gets blocked by part of the iris. People with this type of glaucoma have a sudden increase in eye pressure. Symptoms include severe pain and nausea, as well as redness of the eye and blurred vision. If you have these symptoms, you need to seek treatment immediately, as this is a medical emergency. If your doctor is unavailable, go to the nearest hospital or clinic. Without treatment to improve the flow of fluid, the eye can become blind in as few as one or two days. Usually, prompt laser surgery and medicine can clear the blockage and protect sight.
- **Congenital glaucoma:** In congenital glaucoma, children are born with a defect in the angle of the eye that slows the normal drainage of fluid. These children usually have obvious symptoms, such as cloudy eyes, sensitivity to light and excessive tearing. Conventional surgery is typically the suggested

treatment because medicine may have unknown effects in infants and may be difficult to administer. Surgery is safe and effective. If surgery is done promptly, these children usually have an excellent chance of having good vision.

- **Secondary glaucoma:** Secondary glaucomas can develop as complications of other medical conditions. These types of glaucomas are sometimes associated with eye surgery or advanced cataracts, eye injuries, certain eye tumors or uveitis (eye inflammation).
- **Pigmentary glaucoma:** Pigmentary glaucoma occurs when pigment from the iris flakes off and blocks the meshwork, slowing fluid drainage. A severe form, called neovascular glaucoma, is linked to diabetes.

## Symptoms

At first, there are no symptoms of glaucoma. Vision stays normal, and there is no pain. However, as the disease progresses, a person with glaucoma may notice his or her side vision gradually failing. That is, objects in front may still be seen clearly, but objects to the side may be missed. As the disease progresses, the field of vision narrows and blindness results.

## Diagnosing Glaucoma

Many people may know of the "air puff" test or other tests used to measure eye pressure in an eye examination. But this test alone cannot detect glaucoma.

Glaucoma is often detected through a comprehensive eye exam that includes:

- **Visual acuity test:** This eye chart test measures how well the patient sees at various distances. A tonometer measures pressure inside the eye to detect glaucoma.
- **Visual field test:** This test measures side (peripheral) vision.
- **Dilated eye exam:** Drops are placed in the eyes to widen (or dilate) the pupils. The eye care professional then uses a special magnifying lens to examine the retina and optic nerve for signs of damage and other eye problems. After the exam, close-up vision may remain blurred for several hours.
- **Tonometry:** An instrument measures the pressure inside the eye. Numbing drops may be applied to the eye for this test.
- **Pachymetry:** A numbing drop is applied to the eye. An eye care professional then uses an ultrasonic wave instrument to measure the thickness of the cornea.

## Treatment

Immediate treatment for early-stage, open-angle glaucoma can delay progression of the disease. That means early diagnosis is very important.

Glaucoma treatments include medicines, laser trabeculoplasty, conventional surgery or a combination of any of these. While these treatments may save remaining vision, they do not improve the sight already lost from glaucoma.

Common treatments for glaucoma include:

- **Medicine:** Medicine in the form of eye drops or pills is the most common early treatment for glaucoma. Some medicine causes the eye to make less fluid. Others lower pressure by helping fluid drain from the eye.
- **Laser trabeculoplasty:** Laser trabeculoplasty helps fluid drain out of the eye. A doctor may suggest this procedure at any time. In many cases, patients will need to keep taking glaucoma drugs after the procedure. During the procedure the doctor will use a laser to make several evenly spaced burns that stretch the drainage holes in the meshwork of the eye, allowing fluid to drain better.
- **Conventional surgery:** Conventional surgery makes a new opening for the fluid to leave the eye. Doctors may suggest this treatment at any time. Conventional surgery often is done if medicines and laser surgery fail to control pressure. During the surgery, the doctor will remove a small piece of tissue from the eye to create a new channel for fluid to drain from the eye. If the new drainage opening narrows, a second operation may be needed. Conventional surgery works best when patients have not had previous eye surgery.

## Resources

Information on this page was gathered from documents found on the website for the National Eye Institute (NEI). The NEI is part of the National Institutes of Health (NIH), an agency of the U.S. Department of Health and Human Services. The NEI website is located at [www.nei.nih.gov](http://www.nei.nih.gov).

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