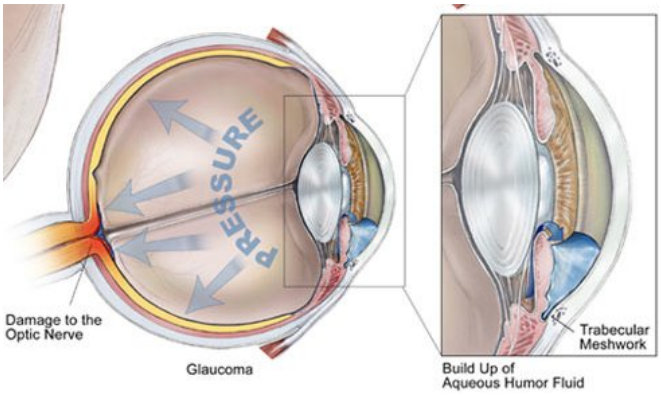
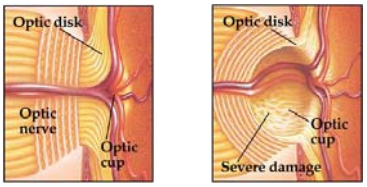
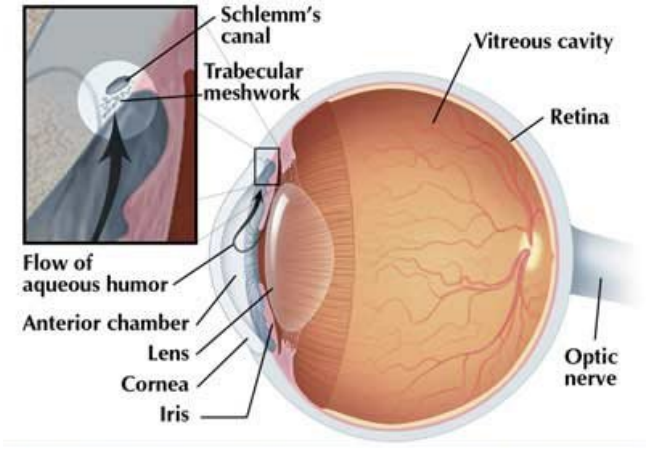
Glaucoma

Dr. Timothy Reese

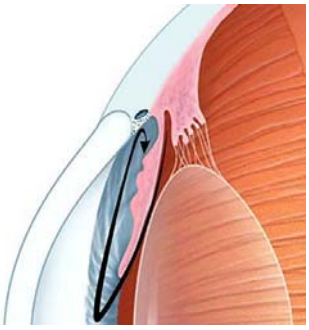


The American Academy of Ophthalmology defines glaucoma as "a group of diseases with certain common features including an intraocular pressure (IOP) that is too high for the continued health of the eye". It was once thought that high IOP was the main cause of glaucoma. Although IOP is clearly a major risk factor, we now know that other factors must also be involved because even people with "normal" IOP can experience vision loss from glaucoma. Loss of vision is caused by damage to the optic nerve. The optic nerve, exiting from the back of the eye, is actually a bundle of over a million nerve fibers and is responsible for carrying the images we see to the brain. Glaucoma, if not treated, gradually whittles away at your peripheral vision without warning and usually without symptoms until you have nothing left but tunnel vision. After that, it is usually not long until all vision is lost. In the United States, approximately 2.2 million people age 40 and older have glaucoma, and of these, as many as 120,000 are blind due the disease. The number of Americans with glaucoma is estimated to increase to 3.3 million by the year 2020.

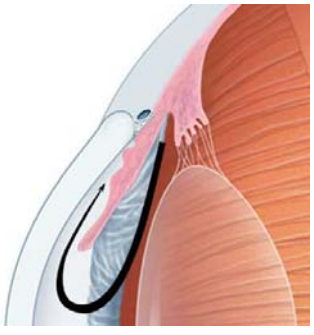




In general, glaucoma is categorized as *open angle* or *closed angle*, and *primary* or *secondary*. The "angle" is a term used to describe the pathway through which fluid exits the eye. Inside the eye, the iris lies flat while the cornea rises above it, like a dome, forming an "angle" where the two meet. Located near the apex of the "angle" is a drain called the *trabecular meshwork*. The drainage of fluid in the eye can be blocked inside the drain (*open angle*), by external obstruction of the drain (*closed angle*), or by a combination of both (*mixed mechanism*), causing high IOP. The drain can be blocked by anomalies in the trabecular meshwork itself or by the iris (*primary*) or by other matter, cells, pigment, injury, etc. (*secondary*).



Open angle glaucoma is by far the most common type of glaucoma. In *open angle* glaucoma the integrity of the "angle" is normal and yet the IOP rises anyway. This can occur for several reasons, i.e., genetic variations or anomalies, or age-related deterioration of the trabecular meshwork.



In c*losed angle* glaucoma, the iris moves forward toward the cornea. If the iris comes in contact with the cornea, the *angle* is closed off and stops the drainage of fluid. *Angle closure* glaucoma is uncommon. It usually happens suddenly in what is called a "glaucoma attack". It is very painful, typically happens in one eye and symptoms include halos around lights, blur, and nausea. Patients suffering from this rare type of glaucoma need emergency medical treatment, followed by a laser procedure called a *peripheral iridotomy* within 24-48 hours. The doctor uses the laser to create a passageway <u>through</u> the iris, so that the fluid in the eye can once again reach the "drain".

Glaucoma can also develop as a complication of other conditions or medications. These *secondary glaucomas* are sometimes associated with eye surgery, advanced cataracts, eye injuries, eye tumors, uveitis (eye inflammation), certain medications, and some systemic diseases. More common secondary glaucomas include a severe form of glaucoma, called *neovascular glaucoma*, which is most common in diabetes. Also, corticosteroid drugs, which are used to treat inflammations and a variety of other diseases, can trigger glaucoma in some people.

Glaucoma suspect is a diagnosis given to people that have some risk factors for glaucoma but no measurable damage to their optic nerves. A recent large-scale study suggests that in certain cases, treating glaucoma suspects with high IOP's can significantly decrease the risk of developing glaucoma.

Risk factors for glaucoma include; elevated IOP, age (over 60), high nearsightedness, diabetes, hypertension, heart disease, family history of glaucoma, race (higher risk in darker pigmented races), prednisone use (ie for asthma, arthritis, collagen-vascular diseases), previous eye injury or surgery and certain congenital or acquired eye disorders.

Lifelong, daily *topical medications* are the most widely used method of treating this disease. Some medications lower pressure by improving fluid drainage, while others inhibit fluid formation. While there is no cure for glaucoma, most cases can be controlled with one or more medications, and a majority of patients tolerate these drugs well. Some patients may have trouble adhering to the prescribed dosage schedule and may be tempted to stop taking the medication or cut back on the dosage. Changing the treatment plan without proper medical advice may allow intraocular pressure to rise again, and the patient may suffer needless visual loss as a result. In these situations, the patient should contact his or her eye doctor to discuss the problem and the best means of dealing with it. Otherwise, your eye doctor will want to retest your IOPs and look at your optic nerves at regular intervals of 3-6 months to make sure that your therapy is maintaining its effectiveness. However, in a few patients, IOP is not adequately controlled by medications. Some medications simply do not work and others loose their effectiveness over time. Also, some people find that the medications' side effects such as stinging, blurred vision, or a chronically red eye become a persistent problem. In these patients, surgery to lower IOP may be a necessary alternative.

Before glaucoma medications were available, *surgery* was the only effective treatment for glaucoma. All surgeries are designed to improve the flow of fluid out of the eye. Some surgeries are designed to bypass the natural drain and form a whole new drain by creating a passage to the outside of the eye with or without a shunt tube. Other surgeries, including laser surgeries, are designed to open or improve the existing natural drain of the eye. After surgery, a few patients will still need to use some medication, though at a lower dosage, to keep their pressure under control and avoid loss of vision. And if the opening of the new or improved drain closes, a second operation may be needed. Your doctor can talk to you about the pros and cons of each surgery if that becomes necessary.

Because the "drain" can become clogged or the *angle* narrow as we age, seeing your eye doctor on a regular basis, especially over age 40, will help ensure that he or she can spot changes that may indicate glaucoma is developing and assure early intervention.