

# Glaucoma

## Marijuana Glaucoma FAQs

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Glaucoma is a group of eye disorders that lead to progressive damage to the optic nerve. People with glaucoma can lose nerve tissue, resulting in vision loss.

The optic nerve is a bundle of about 1 million individual nerve fibers that transmits the visual signals from the eye to the brain. In the most common form of glaucoma, primary open-angle glaucoma, the fluid pressure inside the eye increases. This increase in pressure may cause progressive damage to the optic nerve and loss of nerve fibers. Vision loss may result. Advanced glaucoma may even cause blindness.

Not everyone with high eye pressure will develop glaucoma, and some people with normal eye pressure will develop glaucoma. When the pressure inside a person's eye is too high for a particular optic nerve, whatever that pressure measurement may be, glaucoma will develop.

Glaucoma is the second-leading cause of blindness in the U.S. It most often occurs in people over age 40, although an infant (congenital) form of glaucoma exists. People with a family history of glaucoma, African Americans over the age of 40 and Hispanics over the age of 60 have an increased risk of developing glaucoma. Other risk factors include thinner corneas, chronic eye inflammation and taking medications that increase the pressure in the eyes.

The most common form of glaucoma, **primary open-angle glaucoma**, develops slowly and usually without any symptoms. Many people are not aware they have the condition until they have significant vision loss. Initially, glaucoma affects peripheral or side vision, but it can advance to central vision loss. If left untreated, glaucoma can lead to significant vision loss in both eyes, and may even lead to blindness.

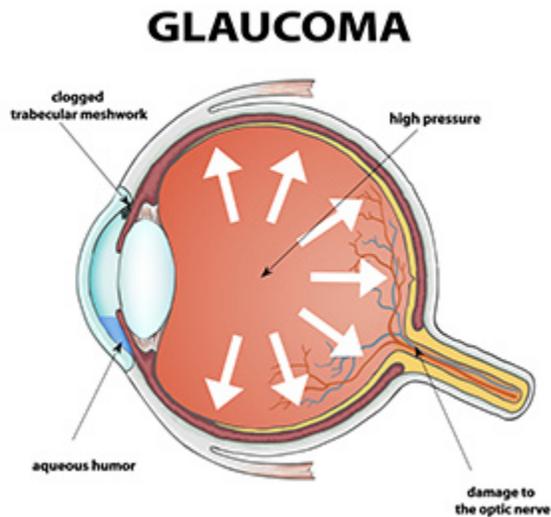
A less common type of glaucoma, **acute angle-closure glaucoma**, usually occurs abruptly due to a rapid increase of pressure in the eye. Its symptoms may include severe eye pain, nausea, redness in the eye, seeing halos or colored rings around lights and blurred vision. This is an emergency condition in which severe vision loss can occur quickly; see your optometrist immediately.

Glaucoma cannot currently be prevented. But if it is diagnosed and treated early, it can usually be controlled. Medication or surgery can slow or prevent further vision loss.

However, vision already lost to glaucoma cannot be restored. That is why the American Optometric

Association recommends an annual dilated eye examination for people at risk for glaucoma. Depending on your specific condition, your doctor may recommend more frequent examinations.

## What causes glaucoma?



There are many theories about the causes of glaucoma, but the exact cause is unknown. Although the disease is usually associated with an increase in the fluid pressure inside the eye, other theories include lack of adequate blood supply to the nerve. Following are the different types of glaucoma and their potential causes.

- **Primary open-angle glaucoma.** This is the most common form of glaucoma. Damage to the optic nerve is slow and painless. Those affected can lose a large portion of vision before they notice any vision problems.

One theory about its development is that the eye's drainage system becomes inefficient over time. This leads to an increased amount of fluid and a gradual buildup of pressure within the eye. Another theory about the cause of this type of glaucoma is that there is poor blood flow (perfusion) to the optic nerve. Other theories also exist.

- **Angle-closure glaucoma.** This type of glaucoma, also called closed-angle glaucoma or narrow-angle glaucoma, is a less common form of the disease. It is a medical emergency that can cause vision loss within a day of its onset.

It occurs when the drainage angle in the eye (formed by the cornea and the iris) closes or becomes blocked. Many people who develop this type of glaucoma have a very narrow drainage angle. With age, the lens in the eye becomes larger, pushing the iris forward and narrowing the space between the iris and the cornea. As this angle narrows, the fluid in the eye is blocked from the drainage system. Therefore the fluid builds up and eye pressure increases.

Angle-closure glaucoma can be chronic (progressing gradually) or acute (appearing suddenly). The acute form occurs when the iris completely blocks fluid drainage. When people with a narrow drainage angle have their pupils dilated, the angle may close and cause a sudden increase in eye pressure. Although an acute attack often affects only one eye, the other eye may be at risk of an attack as well.

- **Secondary glaucoma.** This type of glaucoma results from an injury or other eye disease. It may be caused by a variety of medical conditions, medications, physical injuries and eye abnormalities. Infrequently, eye surgery can lead to secondary glaucoma.
- **Normal-tension or low-tension glaucoma.** In this form of glaucoma, eye pressure remains within the "normal" range, but the optic nerve is damaged nevertheless. It is not known why this happens.

Possibly, people with low-tension glaucoma have an abnormally sensitive optic nerve. Or they may have a reduced blood supply to the optic nerve caused by a condition such as atherosclerosis, a hardening of the arteries. Under these circumstances even normal pressure on the optic nerve can cause damage.

## Risk factors

The following factors can increase the risk for developing glaucoma:

- **Age.** People over age 60 are at increased risk for the disease. African Americans, however, are at increased risk after age 40. The risk of developing glaucoma increases slightly with each year of age.
- **Race.** African Americans are significantly more likely to get glaucoma than Caucasians, and they are much more likely to suffer permanent vision loss. People of Asian descent and Native Alaskans are at higher risk of angle-closure glaucoma. People of Japanese descent are more likely to develop low-tension glaucoma.
- **Family history of glaucoma.** Having a family history of glaucoma increases the risk of developing glaucoma.
- **Medical conditions.** Some studies indicate that diabetes, high blood pressure and heart disease may increase the risk of developing glaucoma.
- **Physical injuries to the eye.** Severe trauma, such as being hit in the eye, can result in immediate increased eye pressure. Internal damage from such a trauma can also cause future increases in pressure. Injury can also dislocate the lens, closing the drainage angle and increasing pressure.
- **Other eye-related risk factors.** Certain features of eye anatomy, namely thinner corneas and optic nerve sensitivity, indicate an increased risk for developing glaucoma. Conditions such as retinal detachment, eye tumors and eye inflammations may also trigger glaucoma. Some studies suggest that high amounts of nearsightedness may also be a risk factor for glaucoma.

- **Corticosteroid use.** Using corticosteroids (including cortisone, hydrocortisone and prednisone) for prolonged periods of time appears to put some people at risk of getting secondary glaucoma.

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## How is glaucoma diagnosed?

Glaucoma is diagnosed through a [comprehensive eye examination](#). Because glaucoma is a progressive disease, meaning it worsens over time, a change in the appearance of the optic nerve, a loss of nerve tissue, and a corresponding loss of vision confirm the diagnosis. Some optic nerves may resemble nerves with glaucoma, but the patients may have no other risk factors or signs of glaucoma. These patients should have routine comprehensive exams to monitor any changes.



Glaucoma testing includes:

- **Patient history** to determine any symptoms the patient is experiencing and if there are any general health problems and family history that may be contributing to the problem.
- **Visual acuity measurements** to determine if vision is being affected.
- **Tonometry** to measure the pressure inside the eye to detect increased risk factors for glaucoma.
- **Pachymetry** to measure corneal thickness. People with thinner corneas are at an increased risk of developing glaucoma.
- **Visual field testing**, also called perimetry, to check if the field of vision has been affected by glaucoma. This test measures your side (peripheral) vision and central vision by either determining the dimmest amount of light that can be detected in various locations of vision, or by determining sensitivity to targets other than light.
- **Evaluation of the retina of the eye**, which may include photographs or scans of the optic nerve, to monitor any changes over time.

- **Supplemental testing, which** may include gonioscopy. This procedure offers a view of the angle anatomy, which is where eye fluid drainage occurs. Serial tonometry is another possible test. This procedure acquires several pressure measurements over time, looking for changes in the eye pressure throughout the day. In addition, devices can be used to measure nerve fiber thickness and to look for tissue loss on specific areas of the nerve fiber layer .

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## How is glaucoma treated?

Glaucoma treatment is aimed at reducing pressure in the eye. Regular use of prescription eye drops are the most common and often the first treatment. Some cases may require systemic medications, laser treatment or other surgery. While there is not yet a cure for glaucoma, early diagnosis and continuing treatment can preserve eyesight.

- **Medications.** A number of medications are currently available to treat glaucoma. Typically, medications reduce elevated pressure in the eye. A single medication or a combination of medications may be prescribed. The type of medication may change if it is not reducing pressure enough or if the patient is experiencing side effects.
- **Surgery.** Procedures include laser treatment, making a drainage flap in the eye, inserting a drainage valve, or destroying the tissue that creates the fluid in the eye. All procedures aim to reduce the pressure inside the eye when medication is not sufficient. Surgery cannot reverse vision loss.
  - **Laser surgery.** Laser trabeculoplasty helps fluid drain out of the eye. A high-energy laser beam stimulates the structure that drains fluid from the eye (the trabecular meshwork) so that fluid drains more efficiently. The results may be somewhat temporary, and the procedure may need to be repeated in the future.
  - **Conventional surgery.** If eye drops and laser surgery aren't controlling eye pressure, you may need a trabeculectomy. This filtering microsurgery creates a drainage flap. Fluid can then percolate into the flap and later drain into the vascular system.
  - **Drainage implants.** Drainage valve implant surgery may be an option for adults with uncontrolled glaucoma or secondary glaucoma or for children with glaucoma. A small silicone tube is inserted in the eye to help drain fluid.

## Treatment for acute angle-closure glaucoma

Acute angle-closure glaucoma is a medical emergency. Those affected can take medication to reduce eye pressure as quickly as possible. They will also likely undergo a laser procedure called laser peripheral iridotomy. In this procedure, a laser beam creates a small hole in the iris to allow fluid to flow more freely into the front chamber of the eye where it then can drain.

## Lifelong treatment

There is no cure for glaucoma. Patients with glaucoma need to continue treatment for the rest of their lives. Because the disease can progress or change without warning, compliance with eye medications and undergoing eye examinations are essential; treatment may need to be adjusted periodically.

Keeping eye pressure under control can slow or stop damage to the optic nerve and continued loss of vision. Your optometrist may focus on lowering the eye pressure to a level that is least likely to cause further optic nerve damage. This level is often referred to as the target pressure and is likely a range rather than a single number. Target pressure differs for each person, depending on the extent of the damage and other factors. Target pressure may change over time. New medications to help fight glaucoma are always being developed.

Early detection, prompt treatment and regular monitoring can help to control glaucoma and reduce the chances for vision loss.