

Introduction

Glaucoma is a group of eye diseases that can lead to blindness if not treated. Open-angle glaucoma, the most common form of glaucoma, affects about 3 million Americans. Half of those affected do not even know they have the disease. This reference summary explains what glaucoma is and how it may be treated.

Anatomy

Our eyes are very sophisticated optical organs that collect light and focus it on the back of the eye, allowing us to see.

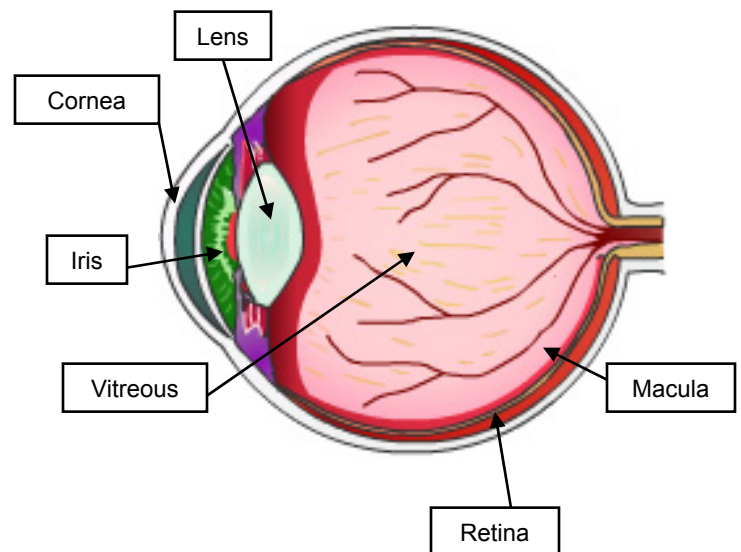
The cornea is the front, transparent part of the eye. It allows light to enter the eye. The rest of the eye is covered with an outer layer called the sclera. An extra layer called the conjunctiva covers the front part of the eye.

Light hits the iris, which is the colored part of the eye. The opening in the middle of the iris is called the pupil. The iris controls the amount of light that enters the eye by changing the size of the pupil.

As light passes through the pupil, it goes through a clear lens. Like the lens of a camera, the lens of the eye focuses light onto the back of the eye. The capsule holds the lens in place.

After passing through the lens and before reaching the back of the eye, light rays travel through a transparent substance called vitreous.

The back of the eye is called the retina. The retina changes light signals into electric signals. These electric signals are sent through the optic nerve to the brain, which translates these signals into images we see.



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The eye has a front, or anterior chamber and a back, or posterior chamber. The anterior chamber is located in FRONT of the iris and the posterior chamber is BEHIND the iris but in front of the lens.

The clear fluid that fills the anterior chamber is created between the iris and the lens. The fluid then gets absorbed through a spongy meshwork in an area called the angle. If the fluid is not reabsorbed at the same speed that it is formed, it builds up in the anterior chamber.

When fluid builds up, pressure and tension inside the eye increases. This increase in pressure causes damage to the eye and the optic nerve and can lead to blindness.

Types of Glaucoma

There are 5 types of glaucoma.

- open-angle glaucoma
- low-tension or normal-tension glaucoma
- closed-angle glaucoma
- congenital glaucoma
- secondary glaucoma

Open-angle glaucoma is the most common type of the condition. Pressure in the eye increases over time at a fairly slow rate. Open-angle can usually be treated with medication or surgery.

Low-tension or normal-tension glaucoma is treated in the same way as open-angle. Symptoms do not occur slowly, as in open-angle; they may happen more unexpectedly.

Closed-angle glaucoma is a medical emergency. This type produces a sudden increase in eye pressure. Symptoms include severe pain and nausea, redness of the eye, and blurred vision. Without immediate treatment, blindness may occur in 1-2 days. Usually, prompt laser surgery can clear blockage and save eyesight.



Congenital glaucoma affects children who are born with eye defects that slow normal fluid drainage. Symptoms include cloudy eyes, sensitivity to light, and excessive

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tearing. Surgery is usually the best treatment and the child has an excellent chance for good vision.

Secondary glaucoma develops as a complication of other medical conditions. Treatment may include medicine or surgery. Medical conditions that may lead to secondary glaucoma include

- eye surgery
- advanced cataracts
- eye injuries
- certain eye tumors
- uveitis (eye inflammation)
- diabetes
- Use of corticosteroid drugs

Symptoms & Risk

In early stages, glaucoma may have no symptoms. Without treatment, people with glaucoma may find that they suddenly have no side vision or peripheral vision. It may seem as though they are looking through a tunnel; this is called tunnel vision.

Over time, patients with glaucoma may continue to lose overall vision until there is none at all. Eye pain and headaches are also symptoms of glaucoma.

Except for congenital glaucoma, which is a rare condition, glaucoma usually only affects people over 60 years old.

For unknown reasons, African-Americans over the age of 40 have a higher risk of getting glaucoma.

If any of the following conditions exist, there is a higher chance of getting glaucoma:

- a family history of glaucoma
- other eye problems
- eye surgeries
- diabetes



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Diagnosis

Diagnosing glaucoma early is essential to prevent vision loss and blindness.

Most patients do NOT have any symptoms right away. Only a detailed routine eye exam can reveal the disease.

A detailed eye examination includes tests of

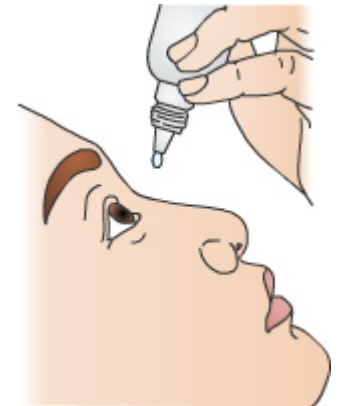
- Visual acuity
- Visual field
- Pupil dilation
- Tonometry
- Pachymetry

The visual acuity test uses an eye chart to measure how well you see at various distances.



The visual field test measures your side, or peripheral, vision. It helps your eye care professional find out if you have decreased side vision, which is a sign of glaucoma.

Pupil dilation provides your eye care professional with a better view of the optic nerve to check for signs of damage. The eye care professional puts drops in the eye to dilate, or widen, the pupil. After the exam, close-up vision may be blurry for several hours.



A tonometry test determines the fluid pressure inside the eye. There are many types of tonometry. One type uses a purple light to measure pressure. Another type is the air puff test, which measures the resistance of the eye to a puff of air.

Pressures above 21mm of mercury are considered abnormal. But, some patients with lower levels may have glaucoma and some patients with higher levels may not have glaucoma. This is why ophthalmologists make the diagnosis of glaucoma based on many different things, not just increased eye pressure.

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During pachymetry, the eye is numbed with drops and an ultrasound probe is used to measure the thickness of the cornea.

Treatment Options

After being diagnosed, glaucoma may be treated a number of ways.

Medication is usually tried first. If medication cannot control eye pressure sufficiently, surgery may be needed. Sometimes laser surgery is recommended as the initial treatment.

Medications are in the form of eye drops and pills. Some cause the eye to make less fluid. Others lower pressure by helping fluid drain from the eye.

Glaucoma medications are usually taken several times a day. Most people have no problems. However, some medicines cause headaches or have side effects that affect other parts of the body. Drops may cause stinging, burning, and redness in the eye.

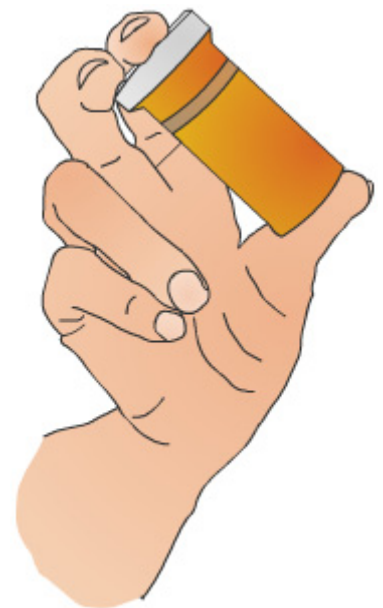
If you need them, your eye care professional will show you how to put drops in your eyes. It is important to tell your eye doctor about other medications you are taking before you begin glaucoma treatment.

Many medications are available to treat glaucoma. If you have problems with one medication, tell your eye doctor. You may need to use a different medication, or just a different dosage.

It is **IMPORTANT** to keep using drops or pills as long as they help to control eye pressure. Since glaucoma often has no symptoms, it may be tempting to stop taking medication.

Surgery

Laser surgery, also called trabeculoplasty, may be needed if medications alone do not keep eye pressure down. Oftentimes, glaucoma medications are still needed even after laser surgery.



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The eye is numbed with special eye drops. While facing the laser machine in a sitting position, the eye care professional will hold a special lens on the eye.

A high-energy beam of light is aimed at the special lens and reflected onto the meshwork inside your eye. You may see flashes of bright green or red light.

The laser makes 50-100 evenly spaced burns. These burns enlarge the drainage holes in the meshwork. This helps to open the holes and lets fluid drain better through them.

Non-laser eye surgery may also be necessary. The purpose of this type of surgery is to make a new opening for the fluid to leave the eye.

A small piece of tissue is removed from the white of the eye, called the sclera. This creates a new place for fluid to drain from the eye. Surgery does not leave an open hole in the eye. A thin, clear tissue called the conjunctiva covers the white of the eye. Fluid flows through the new opening, under the conjunctiva, and drains from the eye.

Summary

Glaucoma is a very serious eye disease that can lead to blindness if not treated early.

The best way to diagnose glaucoma is to have frequent detailed eye exams. African Americans over the age of 40 and anybody else over the age of 60 should have their eyes frequently examined.

With early diagnosis and treatment, most patients with glaucoma can save their vision and continue to enjoy life!



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