



Fact Sheet

GLAUCOMA

*Information retrieved from the Glaucoma Research Foundation -
<http://www.glaucoma.org/glaucoma/>*

What is Glaucoma? Glaucoma is a group of eye diseases that cause damage to the optic nerve. The optic nerve is the back part of the eye that carries the images we see to the brain. Glaucoma is often referred to as the silent thief of sight, gradually stealing vision without warning and, often, without symptoms. If glaucoma is left untreated, it can lead to blindness.

It was once thought that elevated pressure inside the eye was the sole cause of optic nerve damage. Although elevated ocular pressure is absolutely a risk factor, medical researchers and experts now believe that other factors must also be involved since people with "normal" pressure can experience vision loss from glaucoma.

To understand how the development of glaucoma, it is helpful to understand how fluid circulates within the eye. Fluid is produced inside of the eye by a structure known as the ciliary body, which is located just beneath the iris or the colored part of one's eyes. The fluid then travels through the pupil (the black hole in the center of the eye), and exits via the eye's drainage system that is called the trabecular meshwork.

In healthy eyes there is a normal balance between the fluid that is made in the eye and the fluid that leaves the eye. In this manner, the fluid creates a relatively constant and healthy pressure within the eye. This intraocular pressure is needed to keep the eye inflated, nourished, and functioning properly.

Can Glaucoma Occur in a Very Young Child? There is more than one name for congenital glaucoma. It might also be called childhood glaucoma / pediatric or infantile glaucoma because it occurs in babies and young children. Congenital glaucoma is usually diagnosed within the first year of life. Congenital glaucoma is a rare condition that may be inherited, caused by incorrect development of the eye's drainage system before birth. This leads to increased intraocular pressure, which in turn damages the optic nerve. Congenital glaucoma occurs in one out of every 10,000 births in the United States.

Children can also be at risk for glaucoma when an abnormal drainage system occurs due to another disease in the eye. When this occurs, it is called secondary glaucoma. In these cases, the glaucoma may be associated with recognizable iris (the colored part of the eye), corneal, or other eye problems. For example, children with aniridia, which involves structural damage to

the iris, have an increased risk for developing glaucoma.

Who is at Risk for Glaucoma? Everyone is at risk for glaucoma from babies to older adults. Older people have a higher risk for glaucoma. Babies can be born with glaucoma and young adults can have glaucoma. African Americans are particularly susceptible at a younger age. Other high-risk groups include: people over 60, family members of those already diagnosed, people with diabetes, and people who are severely nearsighted.

What are the Different Types of Glaucoma? There are several types of glaucoma. The two main types are open-angle and angle-closure.

Open-Angle glaucoma: Open-angle glaucoma is the most common form of glaucoma, accounting for at least 90% of all glaucoma cases. Open-angle glaucoma is caused by the slow clogging of the drainage canals, which results in increased eye pressure. There is a wide and open angle between the iris and cornea. Open-angle glaucoma develops slowly and is a lifelong condition. People with this condition may not have overt symptoms until there is vision loss.

Angle-Closure Glaucoma: Also called acute glaucoma or narrow-angle glaucoma, this is a less common form of glaucoma and is caused by blocked drainage canals that result in a sudden rise in intraocular pressure. There is a closed or narrow angle between the iris and cornea. There are usually symptoms and damage that are very noticeable and which require immediate medical attention.

Normal-Tension Glaucoma (NTG): Also called low-tension or normal-pressure glaucoma, the optic nerve is damaged even though the ocular pressure is not very high. The causes of NTG are still unknown.

Congenital or Pediatric Glaucoma: This type of glaucoma occurs in babies when there is incorrect or incomplete development of the eye's drainage canals during the prenatal (prior to birth) period. This is a rare condition that may be inherited. When uncomplicated, microsurgery can often correct the structural defects. Other cases are treated with medication and surgery.

Other Types of Glaucoma: Variants of open-angle and angle-closure glaucoma include:

- Secondary Glaucoma
- Pigmentary Glaucoma
- Pseudoexfoliative Glaucoma
- Traumatic Glaucoma
- Neovascular Glaucoma
- Irido Corneal Endothelial Syndrome (ICE)

What is the Prevalence of Glaucoma: It is estimated that over 4 million Americans have glaucoma. It is the leading cause of blindness among African Americans. Glaucoma is the second leading cause of blindness in the world according to the World Health Organization. Glaucoma can cause blindness, if it is left untreated. Approximately 10% of people with glaucoma who receive proper treatment still experience loss of vision.

What are Symptoms of Glaucoma? Symptoms of congenital glaucoma may include the following:

- enlarged eyes
- cloudiness of the cornea (the clear cover of the eye)
- photosensitivity (sensitivity to light)

With later onset open-angle glaucoma, the most common form of glaucoma, there are virtually no symptoms. No pain is associated usually with increased eye pressure. Vision loss begins with peripheral or side vision. A person may compensate for this vision loss unconsciously by turning his or her head to the side, and may not notice anything until significant vision is lost.

The best way to protect one's sight from glaucoma is to get tested. If someone is diagnosed with glaucoma, treatment can begin immediately.

What Tests can be used to Identify Glaucoma? Diagnosing glaucoma is not always easy and careful evaluation of the optic nerve continues to be critical to its diagnosis and treatment. Doctors look at many factors before making decisions about a recommended treatment. If a condition is particularly difficult to diagnose or treat, the person may be referred to a glaucoma specialist.

Tonometry: Tonometry measures the pressure within each eye. Eye drops are used to numb the eyes. A tool called a tonometer is used to measure the inner pressure of the eye. The eye doctor applies a small amount of pressure to the eye by a warm puff of air or a tiny tool. The range for normal pressure is 12-22 mm Hg ("mm Hg" refers to millimeters of mercury, a scale used to record eye pressure). Most cases of glaucoma are diagnosed with pressure exceeding 20 mm Hg. However, some people can have glaucoma at pressures between 12 -22mm Hg. Eye pressure is individualized and unique to each person.

Ophthalmoscopy: This diagnostic procedure is used examine an optic nerve for glaucoma damage. The pupils are dilated with eye drops, so that the eye doctor can see to the back of the eyes to examine the shape and color of each optic nerve. A small tool with a light on the end to light is used to magnify the optic nerve. The next step may be to pursue one or two additional glaucoma exams (perimetry and/or gonioscopy), if the intraocular pressure is not within the normal range or if the optic nerve looks unusual.

Perimetry: This is a visual field test that produces a map of a person's complete visual field. Perimetry will help the doctor determine whether the person has experienced vision loss associated with the glaucoma. The person is asked to look straight ahead and then indicate when a moving light passes within his or her peripheral (or side) vision. The result is a "map" of the person's visual field. If glaucoma has been diagnosed, visual field tests are typically completed one to two times a year to check for any changes in the person's vision.

Gonioscopy: This diagnostic exam helps to determine whether the angle where the iris meets the cornea is open and wide or narrow and closed. Eye drops are used to numb the eye before this procedure. A hand-held contact lens is placed gently on the eye. This contact lens has a mirror to reveal to the eye doctor if the angle between the iris and cornea is closed and blocked (a possible sign of angle-closure or acute glaucoma) or wide and open (a possible sign of open-angle, chronic glaucoma).

Pachymetry: This simple and painless test is used to measure the thickness of the cornea -- the clear cover at the front of the eye. A pachymeter probe is placed gently on the front of the eye (the cornea) to measure its thickness. Pachymetry can help with the diagnosis of glaucoma because corneal thickness has the potential to influence eye pressure readings. The doctor uses this measurement to better understand the person's eye pressure reading and develop a treatment plan. The procedure takes about a minute to measure both eyes.

How is Glaucoma Treated? Glaucoma is not curable, and vision that has been lost cannot be regained. With medication and/or surgery, it is possible to stop further vision loss. Since open-angle glaucoma is a chronic condition, it must be monitored throughout the person's life.

Diagnosis is the first step to preserving an individual's vision.

Medical treatments may involve the use of topical eye drops and oral medications. These treatments help to either increase the exit of fluid from the eye or decrease the production of fluid inside the eye; each result will lower the eye pressure.

There are two main types of surgical treatments: filtering surgery and laser surgery. Filtering surgery (also known as micro surgery) involves the use of small surgical tools to create a drainage canal in the eye. In contrast, laser surgery uses a small but powerful beam of light to make a small opening in the eye tissue.

What are the Educational Needs of a Child with Glaucoma? If the child has been diagnosed with a visual impairment, including blindness as a result of glaucoma and there is educational impact due to the vision loss, the child will be eligible for special education and related services. If the child has an Individualized Education Program, a teacher certified in the area of visual impairment (TVI) and a certified orientation and mobility specialist (COMS) will likely be on the educational team. These providers will provide specialized instructional, aids, and/or equipment to address the learner's educational and mobility needs. The child's hearing should be screened to ensure that there are no further sensory complications to learning.

Resources

Congenital Glaucoma Network - <http://congenitalglaucomanetwork.com/>

This network was founded as a place to facilitate discussion, provide support, and promote awareness of congenital and childhood glaucoma.

For more information about the Colorado Services for Children and Youth with Combined Vision and Hearing Loss Project contact:

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Fact Sheets from the Colorado Services to Children and Youth with Combined Vision and Hearing Loss Project are to be used by both families and professionals serving individuals with vision and hearing loss. The information applies to children, birth through 21 years of age. The purpose of the Fact Sheet is to give general information on a specific topic. The contents of this Fact Sheet were developed under a grant from the United States Department of Education (US DOE) #H326C080044. However, these contents do not necessarily represent the policy of the US DOE and you should not assume endorsement by the Federal Government. More specific information for an individual student can be provided through personalized technical assistance available from the project. For more information call (303) 866-6681 or (303) 866-6605. Updated: 1/12