VISION SERVICES

DR. SAMUEL B. NISBETT, MD, MB, BS, FACS, FRCSC.,MBA
COMPREHENSIVE OPHTHALMOLOGIST

B-4 The Sands Complex, P.O. Box 2434, Basseterre, St Kitts, W.I
(869)465-0152; Cell:(869)762-1954; Fax:(869)465-0153
E-MAIL: drnisbett@sknvision.com; WEB: http://www.sknvision.com

Glaucoma - an Overview

What is Glaucoma?

Glaucoma is a progressive disease of the optic nerve caused when the pressure inside the eye is higher than the optic nerve can withstand. The most common form of glaucoma will cause a patient to slowly lose their vision, starting with their peripheral vision. For many years this loss of vision will go unnoticed by a patient. Left untreated, glaucoma will result in blindness.

Who is at Risk?

Although anyone can get glaucoma, some people are at higher risk than others. Some of the most common risk factors include;

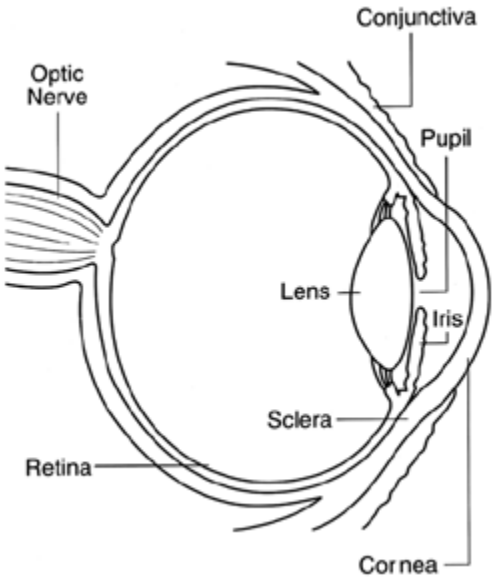
- African Descent
- Over age 40
- People with a family history of glaucoma
- Patients with diabetes

The Statistics

Almost 2.0% of Americans have been diagnosed with glaucoma. Approximately 1/4th of those diagnosed with glaucoma are African Americans. Worldwide, 2.4 million people per year are diagnosed with glaucoma. African Americans are 3 times more likely to have been diagnosed with glaucoma. The prevalence of glaucoma increases with age. For every 10 years of age the incidence of glaucoma approximately doubles, therefore, there are twice as many 60 year olds diagnosed with glaucoma as there are 50 year olds with glaucoma. By the year 2020 it is estimated that the number of patients diagnosed with glaucoma will increase by 50% to 3.6 million patients. Glaucoma accounts for approximately 12% of all new cases of legal blindness each year. Numerous sources have estimated that only ½ of the patients with glaucoma have been diagnosed.

What is the Optic Nerve's Function?

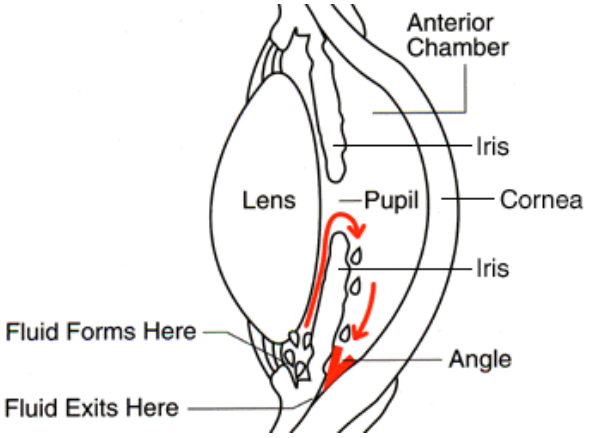
The optic nerve is like a cable made up of over 1 million nerve fibers that carry the information collected by your eye (retina) to the visual cortex of the brain for processing. Glaucoma slowly, decreases the ability of your optic nerve to carry this information to your brain.



Why Does Glaucoma Cause a Loss of Vision?

The buildup of pressure, in your eye, causes glaucoma. Attachments to the ciliary body (a small muscle) produce a fluid called aqueous humor in your eye. The pressure increases in the eye because aqueous humor is being produced too quickly or it is not being drained from the eye fast enough. The production and the drainage systems must be in sync or the pressure will build up causing glaucoma.

There are currently two basic theories as to why excessive ocular pressure causes glaucoma.



1. **The Vascular Theory**

   High intra-ocular pressure decreases blood flow to the optic nerve.

2. **The Physical Theory**

   The high pressure, over time, physically crushes and kills the individual nerve fibers.

What are the Symptoms of Glaucoma?

At first, open-angle glaucoma has no symptoms. Vision stays normal, and there is no pain. As glaucoma remains untreated, people may notice that although they see things clearly in front of them, they miss objects to the side and out of the corner of their eye. Typically, patients will notice no symptoms related to glaucoma until the late stages of the disease.

Without treatment, patients with glaucoma may find that they suddenly have no side vision. It may seem as though they are looking through a tunnel. Over time, the remaining vision may decrease until there is no vision left. Optic nerve damage caused by glaucoma is permanent, therefore, it is important to seek treatment in the early stages of the disease rather than waiting until symptoms are noticed.

Most people think that they have glaucoma if the pressure in their eye is high. This is not always true. High pressure puts you at a higher risk for glaucoma, however, an elevated pressure by itself does not make the diagnosis of glaucoma. Whether or not you get glaucoma depends on the level of pressure that your optic nerve can tolerate without being damaged. This level is different for each person. Although normal pressure is usually said to be between 12-21 mm Hg, a person might have glaucoma even if the pressure is in this range. That is why an eye examination is very important. Conversely, having a pressure over 21 does not mean a person has glaucoma.

View as seen by a person with normal vision View as seen by a person with glaucoma

What Tests are Used to Diagnose Glaucoma?

Traditionally glaucoma was diagnosed by evaluating a patient's peripheral vision with a visual field. Recent advances in laser technology, along with new studies have improved our ability to diagnose glaucoma more accurately and at an earlier stage. A patient that is being evaluated for glaucoma will typically have the following tests.

Comprehensive, Dilated Eye Exam

Diagnosing glaucoma starts with an eye exam. The eye exam should include dilation of the pupils and a stereoscopic view of the retina. Often the pupil dilation is completed or repeated on a subsequent visit when the pupils are dilated for the visual field or fundus photos.

Gonioscopy

A lens is placed on the eye that lets the doctor evaluate the trabecular meshwork. The trabecular meshwork is where the fluid in the eye drains into our lymphatic system.

Tonometry

Measuring the pressure in the eye. There are numerous ways to do this. The most common is with a Goldmann tonometer. Anesthetic eye drops with a dye are placed in the patient's eyes and a blue light is then directed onto the tonometer tip. The tonometer tip measures the cornea by pressing on the patient's cornea.

Pachymetry

Measuring the thickness of the cornea. One of the major findings of the **O**cular **H**ypertension **T**reatment **S**tudy was that if we were measuring the internal pressure of the eye through a thick cornea the pressure will measure higher then it truly is and conversely if the cornea is thin the pressure will be measured lower than it really is. Therefore, in order to know the true intra-ocular pressure we measure the cornea's thickness. Following the application of anesthetic eye drops a small ultrasonic tip briefly touches the cornea and the corneal thickness is displayed or Using OCT.

Fundus photos

The fundus is the back of the eye or retina. Pictures of the eye are helpful to look for changes in the appearance of the optic nerve over time. Fundus photos can be done dilated or undilated depending on the type of retinal camera.

Threshold Visual Field

Since the primary symptom of glaucoma is a progressive decrease in peripheral vision, one of the most important tests is a visual field. In the simplest terms a visual field detects how dim of a light can be seen in the patient's peripheral vision. When used to evaluate a patient for glaucoma a visual field is almost always performed dilated. During the visual field the patient looks straight ahead at a small light and presses the button whenever they see a light. Visual fields are a tedious test and they almost always improve on subsequent sessions. Visual Fields are typically every 6 months.

Scanning Laser Ophthalmoscopy (OCT)

The most recent advancement in the detection and diagnosis of glaucoma is the scanning laser ophthalmoscope. There are numerous types of scanning laser ophthalmoscopes (SLO). Some measure the thickness of the layer of nerve fibers leading to the optic nerve others evaluate the topography or shape of the optic nerve.

How is Glaucoma Treated?

Glaucoma is a lifelong disease that will always require treatment. Glaucoma is much like hypertension and diabetes. We can control these diseases, however we cannot, as of yet, cure them. Today there are numerous ophthalmic medications available to us in the treatment of glaucoma. Some are eye drops that are used only once a day; others are used up to four times a day. More than one medication may be used to treat glaucoma. If glaucoma cannot be controlled with medications other procedures, including surgery may be considered.

The concern of most patients is will I go blind from glaucoma? That is difficult to answer and depends on numerous factors. Due to the many excellent medications available to us today most people, with early treatment, will not go blind from glaucoma. The rate of blindness from glaucoma is much lower today than ever before.

What Can I Do to Decrease My Chances of Going Blind

Glaucomatous blindness is preventable with the current available treatments. Using the medications as prescribed and regular office visits are crucial to preventing the progression of glaucoma. It is best to monitor the pressure three to four times per year, repeat visual fields at least annually and take photographs of the optic nerve every one to two years. Some of these office visits will be brief pressure checks where as others may include your annual eye exam, visual fields, photos of your optic nerves or imaging of your optic nerve with a scanning laser ophthalmoscope.

You can also help protect the vision of family members and friends who may be at high risk for glaucoma – especially, African Americans over age 40 and everyone over age 60. Encourage them to have an eye examination through dilated pupils every year.

Taking Your Eye Drops

If you forget your drops one day don't try to make it up on the next day. Try to be relatively consistent with the time of day you use your drops. If you are late taking your drop it's best not to skip that dosing altogether, just move up your time schedule for that day and then resume your normal schedule the next morning. Taking more drops than prescribed will not make your pressure any lower. Only take your drops the prescribed number of times per day. On the day of your appointment remember to take your drops as you normally do.

If you happen to forget to take your drops on the day of your office visit please tell us. This will prevent an incorrect conclusion that the reason your pressure is high is because your current medication regimen is no longer working, rather than the correct conclusion that your pressure may be high because you forgot your drops.

Conclusion

Often, patients are taken aback when they first learn that they have glaucoma or that they are at an increased risk for glaucoma. Our job is to educate you, therefore, no question is too small. Please feel free to ask us any questions. Glaucoma is very successfully treated today and there are many new medications in the research pipeline. We will always keep you up to date on your treatment