

Who is at risk

A complete eye examination – not only the usual reading of the chart – is mandatory, especially after the age of 40. Those at risk of developing glaucoma include people:

- above 35 years (the risk increases with age);
- with a family history of glaucoma;
- who use steroid drops, tablets, or ointments;
- with diabetes mellitus, hypertension, or who have had eye injuries;
- those who wear 'minus' glasses for short-sightedness;
- with pain, redness, and watering in the eyes; and
- those who see colored rings around lights.

Everyone should have a comprehensive eye examination periodically as it can help detect other preventable, controllable, or treatable diseases.

Treatment – a holistic view

There is no cure for glaucoma. Once nerve fibers die and visual function is lost, it cannot be recovered. Treatment can help preserve the remaining vision; hence it is imperative to detect the disease in its earliest stage.

The management of glaucoma must be an individualized effort. Simplistically speaking, in angle closure glaucoma doctors use a laser to create an alternative path for the fluid to drain out. However, advanced cases require medication and surgery as for open angle glaucoma. An attack of closed angle glaucoma is an emergency and the IOP must be lowered as soon as possible to prevent damage to the optic nerve.

For open angle glaucoma initially eye drops are used to lower IOP. If the disease is advanced, and/or medical treatment fails, surgery may be necessary.

Medical therapy is expensive, and likely to be life-long. As with any treatment, there is a risk of side effects. Sometimes the side effects may be more uncomfortable for the patient, and less acceptable, than living with the disease. Therefore doctors consider the risk-benefit ratio of the treatment options for glaucoma. The main criterion is how much functional capacity is affected rather than the actual degree of vision loss. Your doctor will select the treatment most suited for your condition, please follow the advice meticulously.

In some patients glaucoma may be controlled by medicine alone, while others may need laser treatment or surgery. However, glaucoma surgery is not as predictable as cataract surgery and carries more risks, including loss of the eye from devastating bleeding or infection. It is usually used if drugs fail to control the eye pressure, or for socioeconomic considerations.

Non-penetrating surgery can also help decrease eye pressure and has fewer complications. But its results are not as good. Hence it is not a first line of treatment for glaucoma. In cases with poor potential for visual recovery or function, a different kind of laser may be used to reduce eye pressure.

Need for constant care

Life long monitoring is essential, the frequency of follow up visits depends on the individual case. At each visit most of the tests may be repeated to determine the progression of the disease and decide whether change in treatment is needed.

If there is an emergency at night, during a weekend, or on a holiday, come for emergency care to the Institute. Always mention the patient's ID number, name and the doctor's name in all communications.



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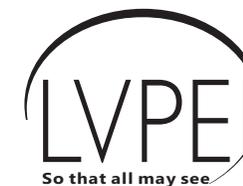
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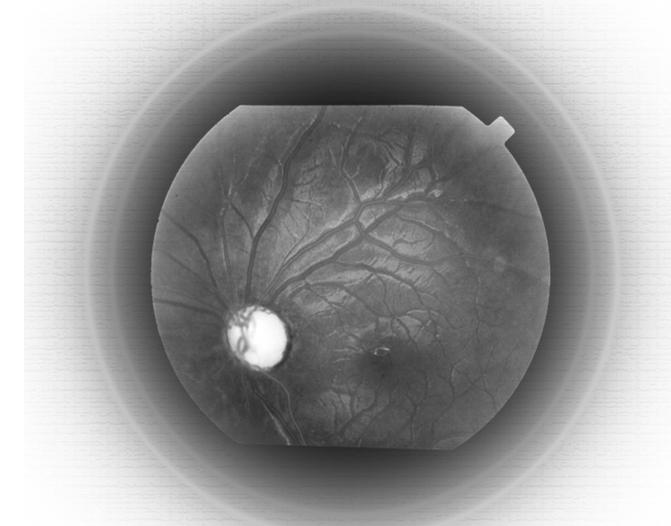
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GLAUCOMA



World Health Organization

**Collaborating Centre for
Prevention of Blindness**

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Your doctor has told you that you may have glaucoma and you are worried. Though there is no cure for this condition, it is crucial to identify it so that doctors can help preserve your remaining vision and enable you to live a full life.

What is glaucoma

Glaucoma is a disease of the optic nerve that affects approximately 60 million people globally. It is the second most common cause of blindness, leaving an estimated 7.5 million people blind. In India it affects 11 million people, of which 1.5 million are blind.

In glaucoma the field of vision decreases so gradually that often the patient does not appreciate the problem till it is too late. Since it usually causes blindness without any symptoms, glaucoma has been called the 'sneak thief of sight'.

What causes glaucoma

Our eyes constantly produce a clear fluid called aqueous humor (Fig 1 & Fig 2), which bathes and nourishes its different parts (this is different from tears). Normally the fluid drains out of the eye through a 'drainage canal' located in the 'angle' of the eye (Fig 2), the junction between the cornea and the iris. In persons with glaucoma, the fluid does not drain out as freely as it should, thus increasing the pressure inside the eye, known as intraocular pressure (IOP).

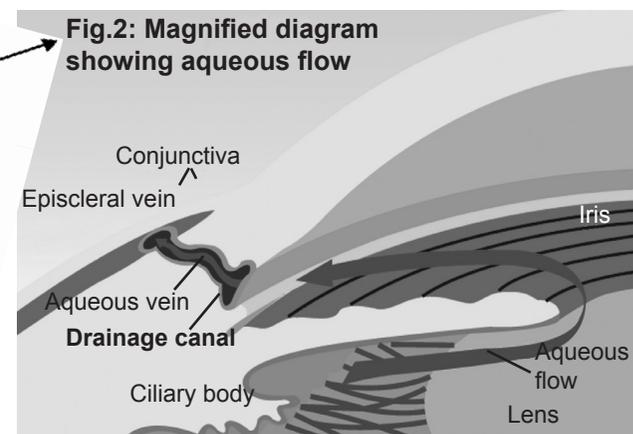
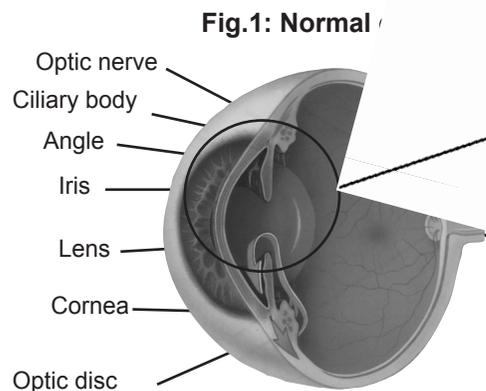
The optic nerve carries all sensations from the retina to the brain; the part of the optic nerve that is inside the eye is called the optic disc. Raised IOP damages the optic disc. Glaucoma can sometimes occur with a statistically "normal" IOP. Hence the vulnerability of the optic disc is another factor that needs to be considered. Accordingly, the diagnosis of glaucoma requires more than the mere measurement of intraocular pressure.

Types of glaucoma

There are several types of glaucoma, all of them can increase IOP and damage the optic nerve.

In open angle glaucoma, an increase in resistance to the outflow in the canal causes a rise in the IOP. This type develops slowly and the symptoms may not be obvious till the damage has occurred. The patient may lose peripheral vision, leaving only central or 'tunnel' vision. This occurs more among people above 45 years of age.

In angle closure glaucoma there is a relative block to the flow of fluid, which causes raised pressure. This occurs more among long-sighted people. In the rarer acute cases, the symptoms are dramatic and may include severe pain in the eye, headache, nausea, reduced vision, and seeing rainbow coloured rings around lights. Stress, anxiety, and reading may



also precipitate an attack, which may resolve spontaneously but recur after some time.

The more common variety of angle closure glaucoma is chronic angle closure. This behaves similar to open angle glaucoma but the 'drainage' canal is closed by the iris.

The third type is developmental glaucoma, which may be further divided into congenital glaucoma (in infants from birth) and juvenile glaucoma (in children and young adults).

Glaucoma or high IOP may also be secondary, due to other causes, such as use of steroid drops without prescription. Such drops should never be used without monitoring the intraocular pressure.

How is glaucoma diagnosed

Since the treatment methods for open angle and angle closure glaucoma are different, it is important to identify the mechanism involved. The diagnosis (or exclusion) of glaucoma requires a detailed and comprehensive eye examination.

- Routine vision test that requires reading letters from a chart.
- Slit lamp (microscope) examination: This special microscope is the ophthalmologist's stethoscope and all patients, not just those suspected of having glaucoma, must undergo a slit lamp examination.
- The pressure inside the eye is measured with an 'applanation tonometer' attached to the slit lamp. A hand held version of the instrument is also effective. It may be necessary to obtain multiple readings of the pressure during the course of the day and at night. The older method of resting an instrument on the cornea while the patient lies down is not accurate. The newer non-contact air soft (computerized) instrument may be good for screening but cannot be used for diagnosis or treatment of glaucoma.

- An examination of the angle of the eye is done with the help of a gonioscope. This is a contact lens placed on the eye to examine the angle of the eye. Its use is mandatory in determining the type of glaucoma.

The above two steps require the use of drops to eliminate sensation in the eye. The drops may burn a little bit.

- An optic disc examination on a dilated eye is also required. The doctor will usually instill eye drops to dilate the pupil to facilitate examination of the optic disc and the back of the eye, the retina. For obtaining a stereoscopic view on the microscope a hand-held lens or a contact lens is the best method. A computerized scan of the optic disc may also be done.
- To confirm the diagnosis, the doctor will conduct an automated field or perimetry test. Damage to the optic nerve limits the field of vision, but regular vision, i.e. the ability to read an ophthalmologist's eye chart, is affected at a much later stage. In its early stages glaucoma can only be detected or monitored by using an automated perimetry test. A normal patient will have a 'full field vision', while a person with glaucoma has black, non-seeing areas in the field of vision.

Many people have difficulty doing the perimetry test at first, and may be better at it the second or the third time. Baseline tests are necessary for future comparison and periodic examinations are needed to check the progression of the disease.

ANY automated perimeter is NOT acceptable. The field test is a subjective test and it is important to have a calibrated machine with an appropriate normal database against which to compare your results. Sometimes a diagnosis may not be possible on one visit. In very early cases it may be necessary to repeat the entire examination after a period of observation.