

# Understanding Glaucoma

## What is glaucoma?

Glaucoma is the name for a group of eye conditions in which the optic nerve is damaged at the point at which it leaves the eye. As the diagram below shows, this nerve carries information from the light sensitive layer in your eye, the retina, to the brain where it is received as a picture.

Your eye needs a certain amount of pressure to keep the eyeball in shape so that it can work properly. In some people, the damage is caused by raised eye pressure. Others may have an eye pressure within normal limits but damage occurs because there is a weakness in the optic nerve. In most cases both factors are involved but to a varying extent.

Eye pressure is largely independent of blood pressure.

Fig. 1 Cross section of right eye from above showing 'open angle' in chronic glaucoma.

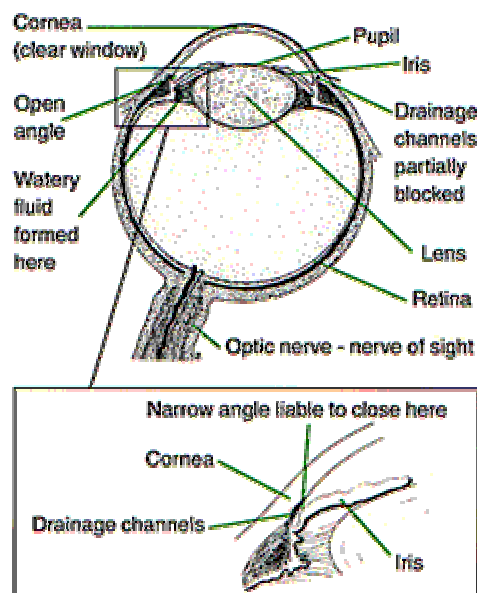


Fig. 2 Enlarged view of inset in Fig.1 showing how acute glaucoma is caused by closure of a narrow angle.

## What controls pressure in the eye?

A layer of cells behind the iris (the coloured part of the eye) produces a watery fluid, called aqueous. The fluid passes through a hole in the centre of the iris (called the pupil) to leave the eye through tiny drainage channels. These are in the angle between the front of the eye (the cornea) and the iris and return the fluid to the blood stream. Normally the fluid produced is balanced by the fluid draining out, but it cannot escape, or too much is produced, then your eye pressure will rise. (The aqueous fluid has nothing to do with tears).

## Why can increased eye pressure be serious?

If the optic nerve comes under too much pressure then it can be injured. How much damage there is will depend on how much pressure there is and how long it lasted, and whether there is a poor blood supply

or other weakness of the optic nerve. A really high pressure will damage the optic nerve immediately. A lower level of pressure can cause damage more slowly, and then you would gradually lose your sight if is not treated.

### **Are there different types of glaucoma?**

Yes there are four main types.

The most common is **chronic glaucoma** (chronic = slow) in which the aqueous fluid can get to the drainage channels ( open angle) but they slowly become blocked over many years (see [Fig. 1](#)) . The eye pressure rises very slowly and there is no pain to show there is a problem, but the field of vision gradually becomes impaired.

**Acute glaucoma** (acute = sudden) is much less common in western countries. This happens when there is a sudden and more complete blockage to the flow of aqueous liquid to the eye. This is because a narrow 'angle' closes to prevent fluid ever getting to the drainage channels (see [Fig. 2](#)). This can be quite painful and will cause permanent damage to your sight if not treated promptly.

There are two other main types of glaucoma. When a rise in eye pressure is caused by another eye condition this is called **secondary glaucoma**. There is also a rare but sometimes serious condition in babies called **developmental glaucoma** which is caused by a malfunction in the eye. This leaflet is about chronic and acute glaucoma.

### **How common is glaucoma?**

In the UK some form of glaucoma affects about 2 in 100 people over the age of 40.

### **Are some people particularly at risk of chronic glaucoma?**

Yes. There are several factors which increase the risk.

- **Age.** Chronic glaucoma becomes much more common with increasing age. It is uncommon below the age of 40 but affects one per cent of people over this age and five per cent over 65.
- **Race.** If you are of African origin you are more at risk of chronic glaucoma and it may come on somewhat earlier and be more severe. So make sure that you have regular tests.
- **Family.** If you have a close relative who has chronic glaucoma then you should have eye tests at intervals. You should advise other members of your family to do the same. This is especially important if you are aged over 40 when tests should be done every two years.
- **Short sight.** People with a high degree of short sight are more prone to chronic glaucoma.
- **Diabetes** is believed to increase the risk of developing this condition.

### **Why can chronic glaucoma be a serious risk to sight?**

The danger with chronic glaucoma is that your eye may seem perfectly normal. there is no pain and your eyesight will seem to be unchanged, but your vision is being damaged. Some people do seek advice because they notice that their sight is less good in one eye than the other.

The early loss in the field of vision is usually in the shape of an arc a little above and/or below the centre when looking 'straight ahead'. This blank area, **if the glaucoma is untreated**, spreads both outwards and inwards. The centre of the field is last affected so that eventually it becomes like looking through a long tube, so-called 'tunnel vision'. In time even this sight would be lost.

### **How is chronic glaucoma detected?**

As glaucoma becomes much more common over the age of forty you should have eye tests at least every two years and **ask for all three glaucoma tests**. This has been shown to be much more effective in detecting glaucoma than just having one or two. These tests are:

1. viewing your optic nerve by shining a light from a special electric torch into your eye
2. measuring the pressure in the eye using a special instrument
3. you are shown a sequence of spots of light on a screen and asked to say which ones you can see.

All these tests are very straightforward, don't hurt and can be done by most high street optometrists (opticians).

### **How is chronic glaucoma treated?**

The main treatment for chronic glaucoma aims to reduce the pressure in your eye. Some treatments also aim to improve the blood supply to the optic nerve. You will need to go to hospital for treatment and have regular check-ups afterwards.

Treatment to lower the pressure is usually started with eye drops. These act by reducing the amount of fluid produced in the eye or by opening up the drainage channels so that excess liquid can drain away. If this does not help, your specialist may suggest either laser treatment or an operation called a trabeculectomy to improve the drainage of fluids from your eye.

Your specialist will discuss with you which is the best method in your particular case.

### **Can chronic glaucoma be cured?**

Although damage already done cannot be repaired, with early diagnosis and careful regular observation and treatment, damage can usually be kept to a minimum, and good vision can be enjoyed indefinitely.

### **What is acute glaucoma?**

In acute glaucoma the pressure in the eye rises rapidly. This is because the periphery of the iris and the front of the eye (the cornea) come into contact so that aqueous is not able to reach the tiny drainage channels in the angle between them. This is sometimes called closed angle glaucoma (see [Figure 2](#)).

### **What are the symptoms of a acute glaucoma?**

The sudden increase in eye pressure can be very painful. The affected eye becomes red, the sight deteriorates and may even blackout. There may also be nausea and vomiting. In the early stages you may see misty rainbow coloured rings around white lights.

### **Is acute glaucoma always severe?**

Sometimes, people have a series of mild attacks, often in the evening. Vision may seem 'misty' with coloured rings seen around white lights and there may be some discomfort in the eye. If you think that you are having mild attacks you should contact your doctor without delay. In routine examinations the structure of the eye may make the examiner suspect a risk of acute glaucoma and advise further tests.

### **What is the treatment?**

If you have an acute attack you will need to go into hospital **immediately** so that the pain and the pressure in the eye can be relieved. Drugs will be given which both reduce the production of aqueous liquid in the eye and improve its drainage.

An acute attack, if treated early, can usually be brought under control in a few hours. Your eye will become more comfortable and sight starts to return. When the pain and inflammation have gone down, your surgeon will advise making a small hole in the outer border of the iris to relieve the obstruction, allowing the fluid to drain away. This is usually done by laser treatment or by a small operation.

Usually the surgeon will also advise you to have the same treatment on the other eye, because there is a high risk that it will develop the same problem.

This treatment is not painful. Depending on the circumstances and the response to treatment, it may not require admission to hospital. Sometimes a short stay in hospital may be advised.

### **Can acute glaucoma be cured?**

If diagnosed without delay and treated promptly and effectively there may be almost complete and permanent recovery of vision. Delay may cause loss of sight in the affected eye. Occasionally the eye pressure may remain a little raised and treatment is required as for chronic glaucoma.

### **Will I be able to drive?**

Most people can still drive if the loss of visual field is not advanced. To assess possible damage to your peripheral vision you will need a special test to see whether your sight meets the standard of the Driver and Vehicle Licensing Authority. Ask your specialist about this. The [IGA](#) leaflet about driving may also be helpful.

### **What if my sight cannot be fully restored?**

Early detection and treatment will usually prevent or retard further damage by glaucoma. Much can be done to help you use your remaining vision as fully as possible. You should ask your optician or optometrist about low vision aids and whether you are eligible to register as partially sighted or blind. Registration opens the door to expert help and sometimes to financial benefits.

## **Further help and information**

The **International Glaucoma Association** supports patients by providing information, so that they can cooperate fully in their treatment and prevent sight loss. It also promotes awareness and early detection of glaucoma, and support and carries out research.

### **The International Glaucoma Association (IGA),**

108c Warner Road  
London  
SE5 9HQ

Sightline - 020 7737 3265

Website [www.iga.org.uk](http://www.iga.org.uk)

Available for advice by phone, letter or email between 9.30am to 5.00pm Monday to Friday.

**The Partially Sighted Society** offers information and advice, publications, aids to vision, enlargement services and local support to help you make the most of your vision. Contact:

### **The Partially Sighted Society**

Queen's Road,  
Doncaster DN1 2NX  
Tel. +44 (0) 1302 323132

The **Royal National Institute for the Blind (RNIB)** provides over 60 different services to help anyone with impaired vision. It provides talking books, value-for-money holidays and special products such as easy-to-see watches. It also offers information, advice and a wide range of publications including Your Guide to RNIB services (free).

### **Royal National Institute for the Blind,**

224 Great Portland Street,  
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