

The Charity for People with Glaucoma
Established 1974

GLAUCOMA

A Guide



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This free booklet is brought to you by the
International Glaucoma Association (IGA).

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Welcome



The International Glaucoma Association is the charity for people with glaucoma. This guide gives you an introduction to each of the glaucomas, their causes and their treatment, so that you can better understand your own situation and help you retain useful sight for life.

The vast majority of people diagnosed with glaucoma today will not go blind, but only if they adhere to the treatment regime prescribed by their glaucoma specialist and attend their follow up appointments regularly.

This booklet has been provided free of charge because we believe that you should receive the information you need when you ask for it rather than be given a price list. However, we should be most grateful for any donation you can make in order to help us maintain this service.

To donate to the IGA, call 01233 64 81 64.

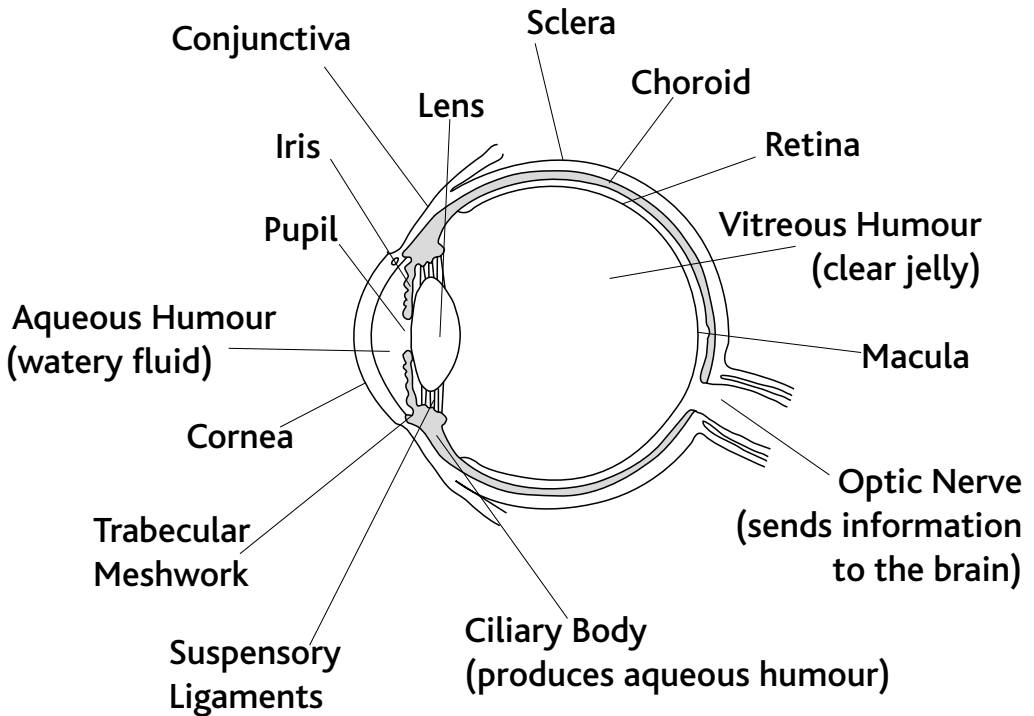
Alternatively, donate up to £10 by texting **EIGA11** followed by either **1, 2, 3, 4, 5 or 10** to indicate the amount of your donation, and send to **70070**. The text message is free and 100% of the donation will be passed to the IGA.

David Wright, Chief Executive

Structure of the eye

Patient Pictures

Health Press Limited (Oxford)



The eye is shaped like a ball. The tough white outer coat is called the sclera and its surface is covered by a thin skin layer called the conjunctiva. The outer coat is clear at the front of the eye and is called the cornea which is covered by the tear film. Behind the cornea is the iris – the coloured part of the eye – with the pupil forming a hole in its centre.

The space between the cornea and the lens is filled with a clear fluid, called aqueous humour; this fluid maintains the pressure in the eye (the intraocular pressure).

The pressure is determined by the balance between the fluid production inside the eye and its drainage out of the eye.

On the inside of the back of the eye is the retina, which is the light sensitive layer onto which an image of what is being seen is focussed by the cornea and the lens working together.

The central area of the retina, where the most detailed vision is to be found, is known as the macula and has a very high density of light-sensitive cells. Further away from this central detailed-vision area is the area of the retina which also provides our peripheral vision.

Immediately under the retina is the choroid, which is the layer of the eye that provides the blood supply to the cells of the retina and onto which the retina is attached. Light that has passed through the front of the eye and is focussed onto the retina is finally converted into a series of complex electrical impulses by retinal photoreceptor cells known as rods and cones. These signals pass along the optic nerve to the back of the brain, where the final image is processed.

What is glaucoma?



Glaucoma is the name given to a group of eye conditions in which the optic nerve is damaged where it leaves the eye. This nerve carries information about what is being seen from the eye to the brain and as it becomes damaged vision is lost. Glaucoma affects about two per cent of people over the age of 40 in the UK.

Although any vision which has been lost to glaucoma cannot be recovered, with early diagnosis, careful monitoring and regular use of the treatments, the vast majority of patients retain useful sight for life.

What causes glaucoma?



The damage to the optic nerve in glaucoma is usually associated with excessive pressure within the eye. A certain level of pressure is needed for the eye to keep its shape and to work properly, but if the eye pressure gets too high, it squeezes the optic nerve and kills some of the nerve fibres, which leads to sight loss. The first areas to be affected are the off-centre parts of the vision. If the glaucoma is left untreated, the damage can progress to tunnel vision and eventual loss of central vision, although blindness is rare.

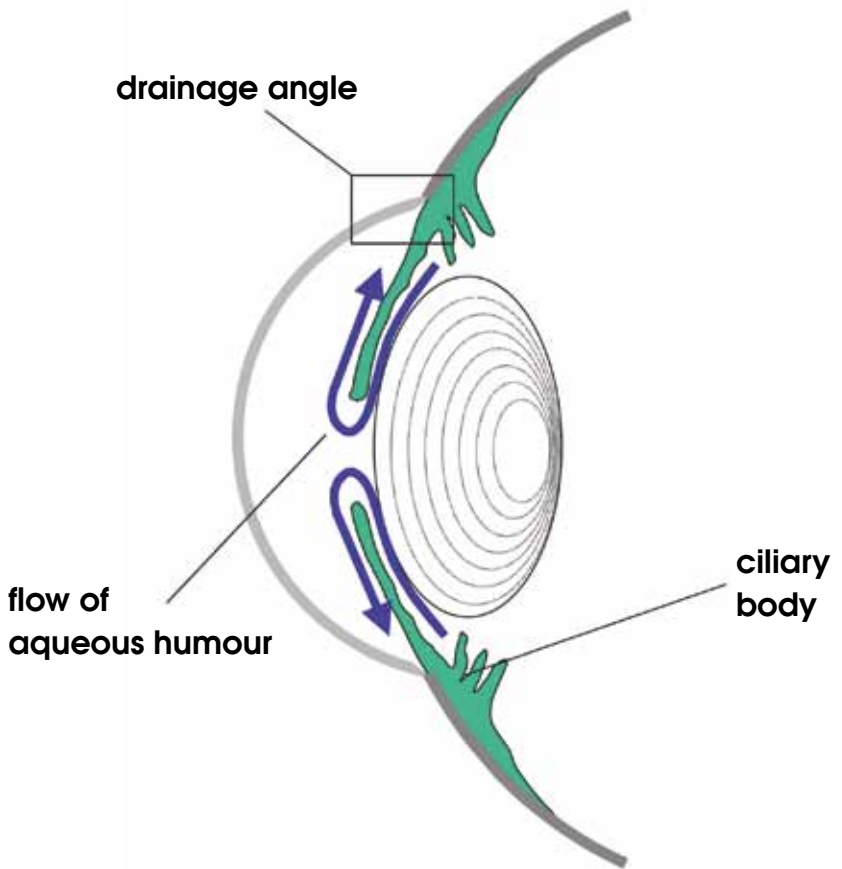
In some forms of glaucoma, the eye pressure is not raised. Glaucoma can develop where eye pressure is within the statistically-defined 'normal' range but the optic nerve still becomes damaged. This is known as **normal (or low) tension glaucoma**.

High eye pressure does not always cause glaucoma. A common condition is ocular hypertension, where the eye pressure is above the statistically-defined 'normal' level, but there is no detectable damage to the field of vision or optic nerve. This condition may be monitored without treatment or may be treated in the same way as glaucoma, depending on the specialist's view of the risk of developing glaucoma.

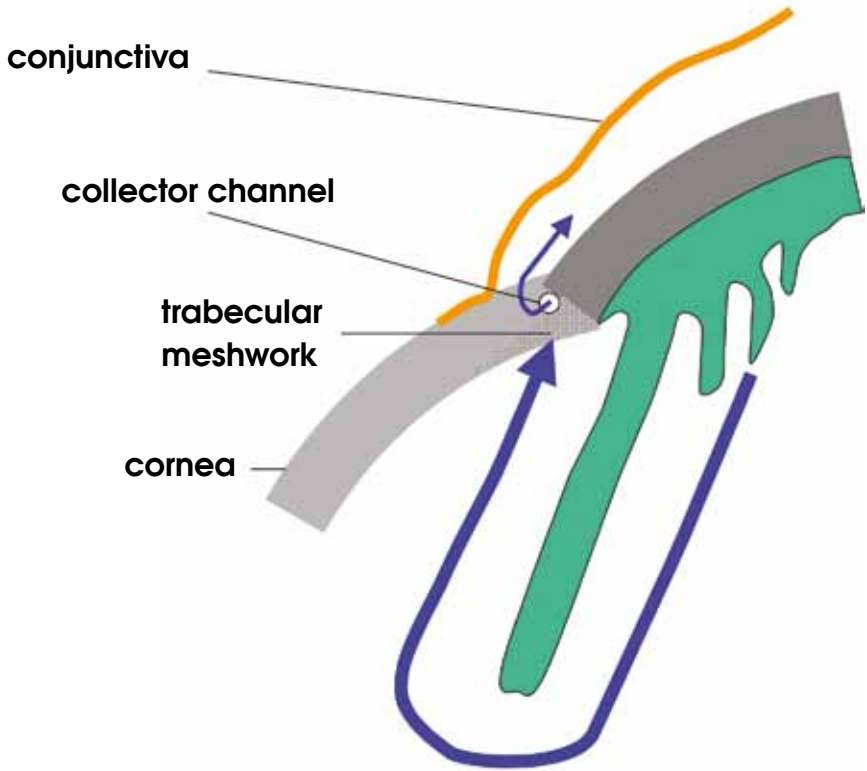
What creates pressure within the eye?

Eye pressure (**intraocular pressure**) is controlled by a watery fluid called **aqueous humour**, which fills the front part of the eye. This fluid is made in the **ciliary body** (a ring of tissue behind the coloured part of the eye, which is called the iris). It flows forward through the pupil and drains away through tiny drainage channels, called the **trabecular meshwork**.

The trabecular meshwork is situated in the **drainage angle** between the **cornea** (the clear window at the front of the eye) and the iris. In a normal eye there is a balance between the production and drainage of this fluid, but in some eyes this balance becomes disturbed. Most cases of glaucoma occur because the flow of fluid out of the eye becomes restricted and the pressure in the eye rises.



Flow of aqueous humour in the eye



Outflow of aqueous humour through the drainage angle

What are the different types of glaucoma?

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There are four main types of glaucoma:
primary open angle glaucoma, primary angle closure glaucoma, secondary glaucoma and developmental glaucoma.

Primary open angle glaucoma (POAG)

This is the most common form of glaucoma. It is a chronic (slowly-developing) condition in which the eye pressure rises because the drainage channels themselves are not good enough at draining fluid out of the eye. This is not because of a visible obstruction blocking the flow: as the name of this type of glaucoma suggests, the drainage angle remains 'open'. The eye pressure rises very slowly and there is no pain to warn of a problem, even though the optic nerve is being damaged. When part of the field of vision in one eye is damaged, the other eye may 'fill in' the gap if the damage has not occurred in the same part of the field of vision in both eyes. For this reason, much damage often has been done before the person with glaucoma realises there is a problem with his/her sight. It is important to diagnose and start treating sight-threatening glaucoma early on, before it has advanced to a stage where there has been extensive sight loss.

Primary angle closure glaucoma (PACG)

This sort of glaucoma is less common in Western countries and more often found in people of Asian origin. It may be acute (sudden onset) or chronic (slowly developing).

Acute primary angle closure (sometimes called '**acute glaucoma**') develops when the access of the aqueous humour to the trabecular meshwork is blocked because the iris has come forward, causing the drainage angle to 'close'. This means that fluid cannot escape from the eye and the pressure rises. This tends to be very painful because the rise in pressure happens suddenly. Symptoms include seeing halos around light sources, a red eye, cloudy vision and, sometimes, sickness. It must be treated straight away and, in most cases, the vision recovers completely. However, if treatment is delayed, there may be permanent damage to the eye and sight is irretrievably lost. When damage to the nerve has occurred, the term **primary angle closure glaucoma** is used. The tendency for this glaucoma to develop depends on the shape of the eye and is more common in 'long-sighted' eyes.

Sometimes people experience a series of mild attacks of angle closure. These are called **sub-acute attacks** and often occur in the evening. Vision may seem misty, with coloured rings around white lights and there may be some discomfort and redness in the eye. If you have these symptoms, you should consult your optometrist without delay. **Chronic angle closure** develops slowly, usually without symptoms, although the reason for the rise in eye pressure is similar to acute primary angle closure. When damage to the nerve has occurred, the

term **chronic primary angle closure glaucoma** is used. Treatment is given to reduce the eye pressure to a level at which no further damage to the optic nerve occurs.

Secondary glaucoma

This kind of glaucoma can either be open angle or closed angle in nature – in other words, there are various ways in which the eye pressure rises. It has an identifiable cause, being ‘secondary’ to another condition. As well as treating the glaucoma, the other condition which has caused the glaucoma also may need to be addressed. The eye may then return to a normal state and not require further treatment, or it may have been damaged so that ongoing glaucoma treatment will be required.

Developmental glaucoma

This is a rare condition where the eye has failed to form properly. It is present in about 1 in 10,000 babies and may be associated with other developmental abnormalities of the eye. For full details of symptoms and treatments, contact the International Glaucoma Association and ask for our booklet ‘Glaucoma in Babies and Children’.

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Thank you for any support you are able to give.

Are some people at increased risk of developing glaucoma?



Yes, there are several risk factors which make the onset of glaucoma more likely and they tend to be cumulative in their effect.

Age

POAG becomes much more common with increasing age. It is uncommon below the age of 40, but the number of people with the condition rises from about two per cent of people over the age of 40 to more than five per cent for those over the age of 80.

Blood pressure

People with low blood pressure, in relation to the eye pressure, have a greater risk of worsening of glaucomatous sight loss. The eye doctor may want to ensure that the blood pressure is not too low and may review blood pressure treatment, if it is being taken.

Race

People of African-Caribbean origin have about a four times increased risk of POAG when compared with those of a European origin. The condition also tends to come on at an earlier age and be more severe. Regular testing is therefore vital if visual impairment is to be avoided. People of Asian origin are at an increased risk of developing primary angle closure glaucoma.

Family history

There is at least a four times increased risk of developing glaucoma if you have a close blood relative with the condition (father, mother, brother, sister, or child). Eye examinations are funded by the NHS for such people from the age of 40 years, but an earlier test is recommended, especially if you also fall into one of the other risk categories. If you have glaucoma, don't forget to tell your relatives about the condition and the need for them to be tested. More information can be found in the IGA leaflet titled 'Glaucoma and your relatives'.

Short sight

People with myopia (short sight) are at increased risk of developing glaucoma, and should ensure that they are regularly tested for glaucoma.

Long sight

Long sighted people are known to be at increased risk of developing angle closure.

Diabetes

People with diabetes may be at increased risk of developing glaucoma, although it is not known whether there is a direct link between the two conditions.

However, all people with diabetes should have regular routine eye examinations for diabetic eye diseases and glaucoma tests can usually be requested at the same

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and help save sight

By joining us, you can keep up to date with the latest news and information about glaucoma and other eye conditions, as well as helping to support our work and fund research

Application Form

Your details: Name _____

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Please notify the International Glaucoma Association if you:

- **Want to cancel this declaration**
- **Change your name or home address**
- **No longer pay sufficient tax on your income and/or capital gains.**

If you pay Income Tax at the higher or additional rate and want to receive the additional tax relief due to you, you must include all your Gift Aid donations on your Self Assessment tax return or ask HM Revenue and Customs to adjust your tax code*

Signed _____

Date _____

* To make Gift Aid donations, you must have paid or pay an amount of income tax or capital gains tax at least equal to that reclaimed by us on your donation.

Please indicate membership type (tick one box only)

- FRIEND** For an annual subscription of £17.50 if you pay by cheque or debit/credit card (£15.00 if you pay by Direct Debit), you will receive:
- quarterly newsletters featuring the latest facts and viewpoints about glaucoma
 - invitations to 2 free open meetings (lecture + Q&A sessions) every year with glaucoma specialist speakers
 - details of support groups in your area
- MEMBER** For an annual subscription of £17.50 if you pay by cheque or debit/credit card (£15.00 if you pay by Direct Debit) you will receive the same benefits as a Friend, plus:
- an invitation to the Annual General Meeting (AGM)
 - the chance to put resolutions forward at the AGM
 - the right to vote at the AGM
 - eligibility for election to the Council of the Association (Board of Trustees)
 - the IGA Annual Report and Accounts, including minutes of the AGM
- LIFE FRIEND** For a single subscription of £250.00, you will receive the same benefits as a Friend, for your lifetime.
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Members and Life Members are liable for a maximum of £5.00 in the event that the IGA should become insolvent.

Please indicate payment type (tick one box only)

Direct Debit - £15.00

I am interested in paying by Direct Debit and receiving the £2.50 discount. Please call us on 01233 64 81 71.

Cheque - £17.50

I enclose my cheque made payable to International Glaucoma Association. (If you are making a payment from overseas, please send a sterling draft).

Debit/Credit Card - £17.50

I would like to pay by debit/credit card. I authorise the IGA to debit my account with the total shown below.

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To help us support you, please fill in the information below:

Which eye condition have you been diagnosed with? _____

When were you diagnosed? _____

Year of birth _____

Where did you hear of the IGA? _____

Where did you pick up our literature? _____

If you have joined on behalf of someone else, please let us know who. _____

The International Glaucoma Association is registered under the Data Protection Act 1998 of the United Kingdom. Your information will be held on a database within the UK. The database will be administered and controlled by the IGA.

By completing this request form you agree that we may use the information you have given in the following way:

- To maintain records of donations and requests for information.
- To use for future requests for support.

Only the IGA will have access to your information. It will not be disclosed to other third parties except to the extent required by the laws of the United Kingdom.

International Glaucoma Association

Woodcote House, 15 Highpoint Business Village
Henwood, Ashford, Kent TN24 8DH

Telephone: 01233 64 81 71 • **Email:** info@iga.org.uk

www.glaucoma-association.com

What should I do if I fall into one or more of these risk categories?



Glaucoma/ocular hypertension is usually painless and does not cause symptoms until it is quite advanced. It is therefore important to have regular eye health checks which test for it at an early stage. There are three tests that are used to check for glaucoma and ocular hypertension. These tests are rapid and painless.

They are:

1. **Ophthalmoscopy:** Viewing your optic nerve using an ophthalmoscope (special torch).
2. **Tonometry:** Measuring the pressure within your eye.
3. **Perimetry:** Testing your field of vision. This may not be required if your optic nerve appears healthy and your eye pressure is within the normal range.

When you have an eye health check the optometrist must, by law, examine the back of your eye. This will include looking at your optic nerve. It is also recommended that everyone who is considered to be at risk of glaucoma (such as those people who are over the age of forty) has the pressure measured within their eyes.

This is often done by gently blowing a puff of air at your eye. If the results of either of these tests are inconclusive, your optometrist may also ask you to do a field of vision test to make sure everything is normal.

How is glaucoma treated?



Treating primary open angle glaucoma

The aim of treating POAG is to reduce the pressure within the eye to a level at which no further damage occurs to the optic nerve.

Treatment is usually by means of eye drops. These can work to reduce the amount of fluid being produced by the eye, to increase the rate of drainage of fluid from the eye, or both.

There have been major advances in medical (eye drop) treatment in recent years, and the newer drops are far more effective and have fewer side effects than those which were previously available.

Laser treatment may be effective and is sometimes offered instead of, or in addition to, eye drops.

If the eye drops do not provide a sufficient pressure lowering effect, surgical treatments are available.

Normal tension glaucoma (also called normal pressure glaucoma)

Some people develop glaucoma with a normal eye pressure (this is called normal tension or low tension glaucoma). It is believed that poor blood flow to the eye may contribute to the development of the optic nerve damage. In these people, pressure-lowering drops are still the first choice of treatment, with a view to reducing the eye pressure to a level at which further damage to the optic nerve is prevented. However, the eye doctor may want to ensure that the blood pressure is not too low and may review blood pressure treatment, if it is being taken.

Treating primary angle closure glaucoma

Acute angle closure is initially treated with drops and an intravenous injection to lower the eye pressure. Once the pressure is lowered, a laser (iridotomy - laser spots are applied to make a small hole through the iris) or surgical procedure (iridectomy - a small part of the iris is removed) is carried out in order to bypass the blockage in your eye's drainage system and prevent a recurrence of the problem. Normally the same procedure is also performed in the other eye, in order to prevent an attack of acute angle closure in that eye. These treatments are not painful and are usually done on a day patient basis, although a short stay in hospital may occasionally be required. If acute

primary angle closure is diagnosed and treated without delay there may be an almost complete and permanent restoration of vision. However, any delay in addressing the problem may result in permanent damage to the affected eye.

Occasionally the pressure may remain raised and ongoing treatment will be required, as for POAG.

Chronic primary angle closure is treated in a similar way to POAG, with drops to lower the pressure. In addition, laser treatment is often given to prevent further angle closure.

Are there any other types of treatment?

Other treatments, such as tablets, laser therapy and surgery are available, either in place of, or in addition to, eye drops.

Laser trabeculoplasty

Laser spots are applied to the trabecular meshwork to stimulate the flow of fluid out of the eye. The treatment is painless.

Trabeculectomy

This is the most common operation. In a trabeculectomy, the surgeon makes a flap valve over a small hole in the outer wall of the eye. This creates a new passage for the fluid to leave the eye, under the white skin of the

eye, forming a small bump under the upper lid, called a trabeculectomy bleb.

Eye drops & glaucoma



Initial treatment is usually with eye drops. These are sufficient to keep the pressure in the target range in most people. There are several different types of eye drop for glaucoma and your eye doctor may need to change your treatment until the right drop, or combination of drops, is found. Once eye drops have been started, they usually need to be taken for life (there is no such thing as a 'course of treatment' for glaucoma).

How should I take my eye drops?

It is worth getting into a routine so that the drops are not forgotten. For instance you could keep the bottle or phial by your toothbrush, which will be a reminder when you brush your teeth. Rarely drops need to be stored in the 'fridge once they have been opened.

There are various ways to put drops in the eye and everyone will decide which is best for them. One of the simplest is to sit or stand in front of a mirror, pull down the lower lid with a finger of one hand, squeeze or tap the bottle according to instructions with the other hand, and let the drop fall into the pocket between the eye and the lid.

Instilling eye drops



Another method is to tilt your head backwards while sitting, standing or lying down. If your drops are gel and not liquid, it may be easier to lie down in order to spread the gel along the inside of the lower lid.

Closing the tear duct



Photos by Rachel Ganszczyk

After putting the drop in your eye, close your eye and gently press on the inside corner with a finger for one or two minutes. This will help to slow the rate at which drops drain out through the tear duct into your system, rather than staying in the eye where they are needed. A small amount may, even then, drain through the tear duct and be swallowed, which is not harmful but which may lead to unwanted side effects in susceptible people.

Tips:



- If you take more than one type of drop, it is important to leave five minutes or more between each differing drop to prevent the second one washing out the first.
- If you take a drop more than once a day, spread the dose over the day eg if twice a day use the drop at the same time morning and evening i.e. 12 hours apart.
- If you have difficulty knowing if a drop has gone into the eye, keep your drops in the door of the fridge (not the freezer); you will then feel the coldness of the drop entering the eye. Be sure to check with the patient information leaflet (PIL) or pharmacist that your drops can be stored this way.

If you experience any problems with putting your eye drops in, there are compliance aids available to help you. For further information, please contact the IGA Sightline and ask for the leaflet 'Eye Drops and Glaucoma', which gives information and advice on the different drops and their side effects, or ask the staff at your eye clinic.

Because damage to vision in glaucoma is permanent, it is important to prevent it getting worse. For this reason, it is essential to take your eye drops regularly if you want to preserve your vision.

Can I continue to drive with glaucoma?



Most people are still able to drive, provided that their visual field loss is not severe. However, if you have glaucoma in both eyes, you must, by law, inform the Driver and Vehicle Licensing Authority (DVLA) about your condition and undergo a special visual field test in order to check the extent of damage to your sight.

The requirements for driving with glaucoma have been changing in recent times, so please contact the International Glaucoma Association for the latest information.

More information can be found in the IGA leaflet titled: 'Driving and Glaucoma'.

What if my glaucoma cannot be fully controlled?



More than 90 per cent of people diagnosed with glaucoma today will retain useful vision (blindness is rare).

In certain cases, however, it may not be possible to control the glaucoma well enough to retain useful vision. This is often where the condition has been diagnosed at a late stage, treatments have been ineffective, or where the person with glaucoma has had difficulty taking the prescribed medications.

If your vision has deteriorated to an extent where you have difficulty carrying out normal daily tasks, much can be done to help you to use your remaining vision effectively. You should contact your ophthalmologist or optometrist to find out about low vision aids and whether you are eligible for registration as sight impaired or severe sight impaired. Registration is the key to expert help and, in some cases, financial benefit.

Useful contact details:



Driver and Vehicle Licensing Agency (DVLA)
Drivers Customer Services (DCS)
Correspondence Team DVLA, Swansea SA6 7JL

Car Licence Group One call: 0300 790 6806
LGV and PVC Group Two call: 0300 790 6807
Email: drivers.dvla@gtnet.gov.uk
www.dvla.gov.uk

Mission & Vision



The International Glaucoma Association is the charity for people with glaucoma, with the mission to raise awareness of glaucoma, promote research related to early diagnosis and treatment and to provide support to patients and all those who care for them.

Our vision is to ensure that all people with or at risk of glaucoma have the knowledge and access to care that will enable them to maintain a good quality of life.

To find out more about glaucoma, please contact Sightline on 01233 64 81 70

To find out more about the IGA, or to make a donation, please contact us on 01233 64 81 64

For more information



For further information, please contact the IGA Sightline on 01233 64 81 70 or info@iga.org.uk.

Our Sightline advisors can also provide you with more details on Juvenile Glaucoma on request.

Other useful contacts

Benefits line: (0800) 88 22 00

National Blind Children's Society: (01278) 76 47 70

A full list of references and information sources used in the compilation of this leaflet is available on request by phone: 01233 64 81 70 (Sightline) or by email: info@iga.org.uk

We hope that you found this booklet helpful. Your feedback is important to us, please help us improve our information by sending us your comments about the content and format of this publication at marketing@iga.org.uk or by writing to us at the address shown on the back of this booklet.

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Other booklets



Available from the International Glaucoma Association:

Cataracts - A Guide

Dry Eye Syndrome - A Guide

Eye Drops and Dispensing Aids - A Guide

Glaucoma - Babies & Children

Ocular Hypertension - A Guide

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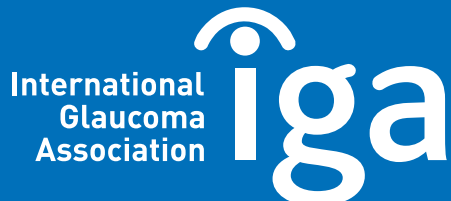
Don't forget:

- take your eye drops as prescribed by your consultant as it is the only way to avoid further sight loss in most cases
- tell your close relatives that you have glaucoma and that they are at higher risk so that they can be tested too as early as possible
- contact the IGA Sightline if you have any questions, we are here to help you

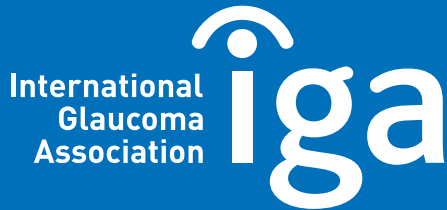
A membership form is enclosed in the middle of this booklet. If you already are a member, please pass it to a relative or friend, you may save someone else's sight.

Sightline: 01233 64 81 70

Monday-Friday 9.30am-5.00pm



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Established 1974



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