Glaucoma UK

All about glaucoma

Glaucoma UK helpline

If you have questions about anything to do with glaucoma, contact our helpline on:

01233 648 170

Monday to Friday 9.30am to 5.00pm

Calls are charged at your standard network cost.

Other ways to find out more

Email: **helpline@glaucoma.uk**

Visit our website: **glaucoma.uk**

Help us keep our services free

Glaucoma UK is the UK's only charity solely focused on ending preventable vision loss from glaucoma. Everyone who needs help and information about glaucoma should be able to get it for free. That's why there's no charge for our booklets and services. We rely on donations, and every contribution truly matters.

If you'd like to contribute to the cost of this booklet or help fund our services, please go to **www.glaucoma.uk/donate** or call **01233 648 164**. We really could not continue without our amazing supporters. Thank you.

Contents

Key points

Glaucoma is a group of common eye diseases where the nerve that takes information from your eye to your brain has become damaged.

Glaucoma can lead to vision loss. But with treatment, most people with glaucoma keep good vision.

Protect your vision by going to all your eye clinic appointments and using any prescribed eye drops every day.

If you get side effects or symptoms that worry you, contact your eye clinic as soon as you can.

Glaucoma can run in families. If you have glaucoma, tell your close family so they can get their eyes tested regularly.

If you drive and have glaucoma in both eyes, you must tell the DVLA (in England, Scotland and Wales) or DVA (in Northern Ireland). If you drive a bus, coach or lorry, you must tell them even if you have glaucoma in just one eye.

What is glaucoma?

Glaucoma is a group of common eye diseases where your optic nerve has become damaged.

Your optic nerve connects your eye to your brain, so damage to this nerve affects your vision. How glaucoma affects vision is different for each person, but most people keep good vision.

For most people, glaucoma starts slowly without symptoms. It usually affects both eyes, but one eye may be worse than the other.

Glaucoma is often – but not always – linked to a build-up of fluid, raising pressure inside the front of your eye. This pressure is called eye pressure or intraocular pressure (IOP).

Your eyes and eye pressure

The front of your eye contains a clear watery fluid called aqueous humour, or sometimes aqueous fluid or just aqueous. Aqueous helps your eye keep its shape and takes oxygen and nutrients to the front of your eye.

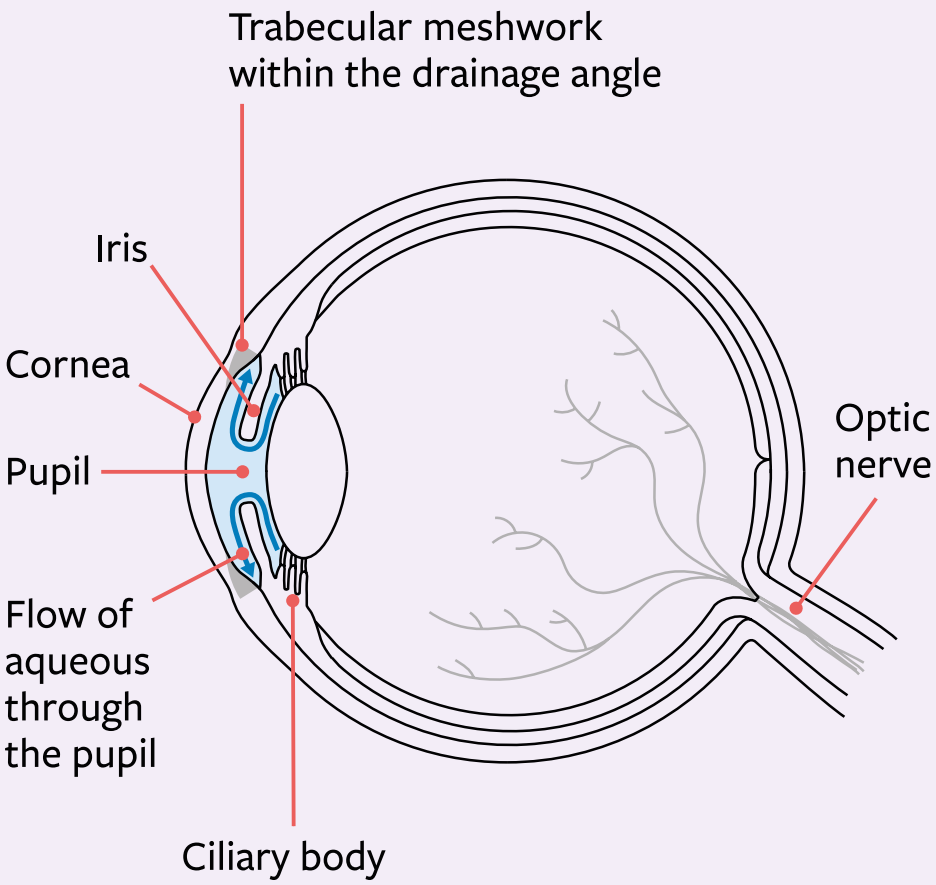
Aqueous is made by a part of your eye called the **ciliary body**.

Aqueous flows from the ciliary body, through your **pupil** to the front of your eye. Your pupil is the opening in the middle of your **iris** that looks like a black dot. Your iris is the coloured part of your eye.

Aqueous drains out of your eye into your bloodstream through tiny drainage channels called the **trabecular meshwork**. These drainage channels are in the **drainage angle** – between your iris and **cornea**. Your cornea is the clear window at the front of your eye.

If aqueous cannot drain properly, it builds up inside your eye and your eye pressure goes up. High eye pressure can damage your optic nerve. Damage to your optic nerve is glaucoma.

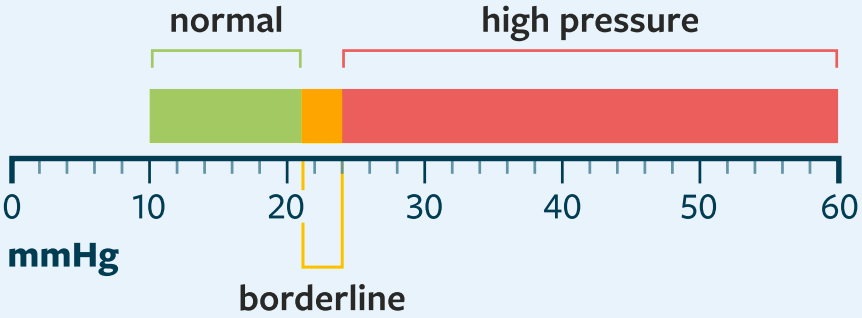
▼ **Structure of eye showing flow of aqueous**



You can have high eye pressure without damage to your optic nerve. This is called ocular hypertension. If you have ocular hypertension, you are at higher risk of developing glaucoma. You should have regular eye tests. It's only glaucoma if there's damage to your optic nerve.

You can have glaucoma damage to your optic nerve without high eye pressure. This is called normal tension glaucoma.

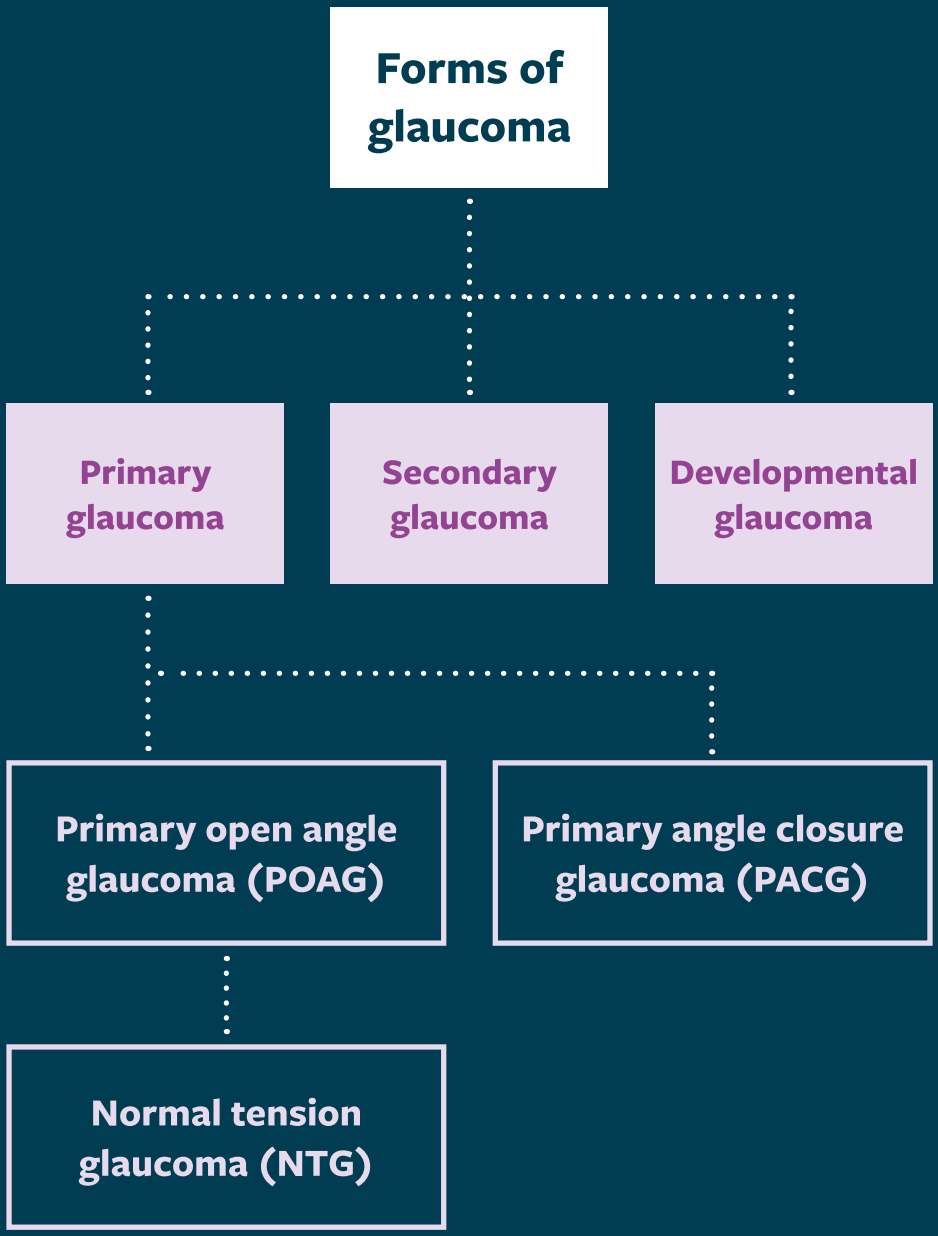
Eye pressure is measured in millimetres of mercury (mmHg). Eye pressure between 10 and 21 mmHg is normal, between 21 and 24 mmHg is borderline, and above 24 mmHg is high.



Forms of glaucoma

Glaucoma is a group of eye diseases, not a single disease.

The main forms of glaucoma are:


Forms of glaucoma
Primary glaucoma
Secondary glaucoma
Developmental glaucoma
Primary open angle glaucoma (POAG)
Primary angle closure glaucoma (PACG)
Normal tension glaucoma (NTG)

Primary open angle glaucoma

Primary open angle glaucoma (POAG) is the most common form of glaucoma in the UK.

POAG is sometimes called chronic open angle glaucoma or just open angle glaucoma.

In POAG, aqueous cannot drain out of your eye properly. Your drainage channels (the trabecular meshwork) do not work well. Aqueous builds up inside your eye, and eye pressure rises.

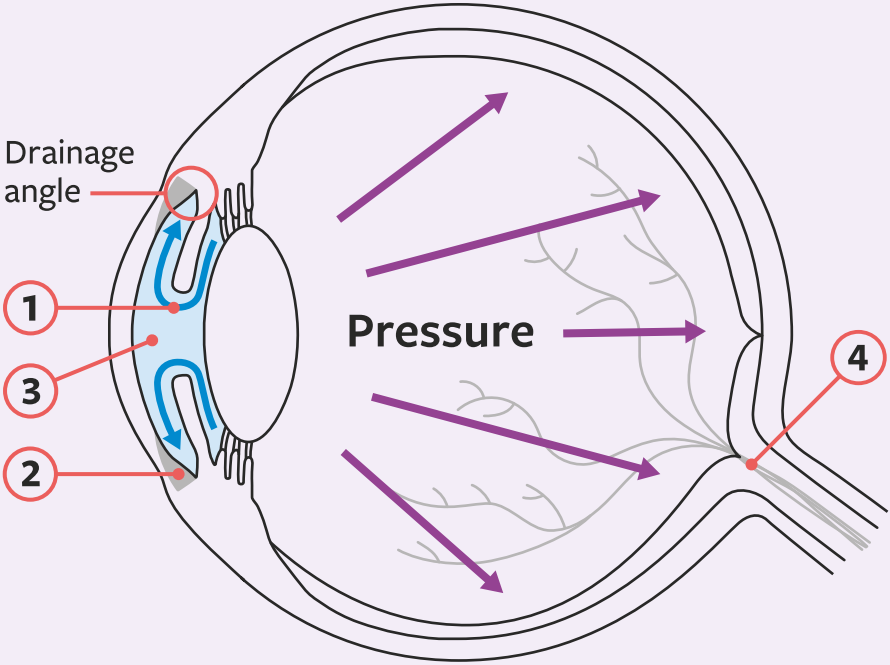
The term primary means that it happens by itself. There's no obvious cause, and it's likely due to genetic factors.

It's called open angle because the angle between your iris and cornea (the drainage angle) is wide open. There's usually no visible block.

POAG starts slowly and without symptoms. Most people with POAG get no pain, and are unaware of vision loss particularly in the early stages.

POAG usually affects both eyes, although one may be more affected than the other.

▼ The drainage angle



1. Aqueous flows through the pupil

2. Poor drainage of aqueous through the trabecular meshwork

3. Too much aqueous stays in the eye, increasing pressure

4. Increased pressure damages the optic nerve

Normal tension glaucoma

Normal tension glaucoma (NTG) is a variant of primary open angle glaucoma.

NTG is sometimes called low tension glaucoma, low pressure glaucoma or normal pressure glaucoma.

In NTG, there's damage to your optic nerve even though your eye pressure is in the 'normal' range.

Doctors are unsure what causes damage to your optic nerve in NTG. Possible causes include:

- Reduced blood flow to your optic nerve
- Pressure inside your eye going up and down more than is healthy for your eye
- Changes to your optic nerve, which lead to it getting damaged more easily

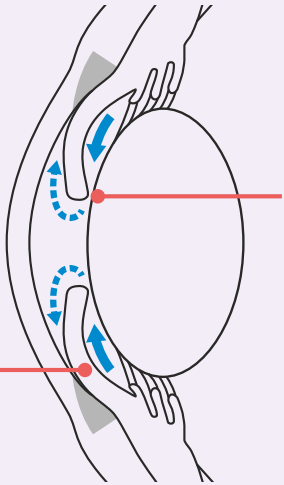
NTG starts slowly and without symptoms. Most people with NTG get no pain, and are unaware of vision loss, particularly in the early stages.

Primary angle closure glaucoma

In **primary angle closure glaucoma** (PACG), your iris moves forward, closing the angle between it and your cornea.

This angle is known as the drainage angle because it's where your drainage channels are. This blocks the drainage channels and aqueous cannot drain properly. Aqueous builds up inside your eye and eye pressure rises, damaging your optic nerve.

Angle closure blocks the drainage channels and leads to high eye pressure ▶



PACG may happen slowly (chronic) or suddenly (acute).

Chronic PACG often has no symptoms, particularly in the early stages.

Symptoms of acute PACG can include:

- Intense eye pain
- Headache
- Feeling or being sick
- Seeing coloured rings around lights
- Red eye
- Blurred or reduced vision

If you get symptoms of acute PACG, go straight to Accident and Emergency or an emergency eye clinic.

Secondary glaucoma

Secondary glaucoma is when something else causes an increase in eye pressure that damages your optic nerve.

Many things can cause secondary glaucoma.
For example:

- Swelling in your eye
- Other eye conditions
- Eye injuries
- Some medicines (such as steroids)

Secondary glaucoma can be open angle or angle closure. The result is the same—aqueous cannot drain well out of your eye, and eye pressure goes up.

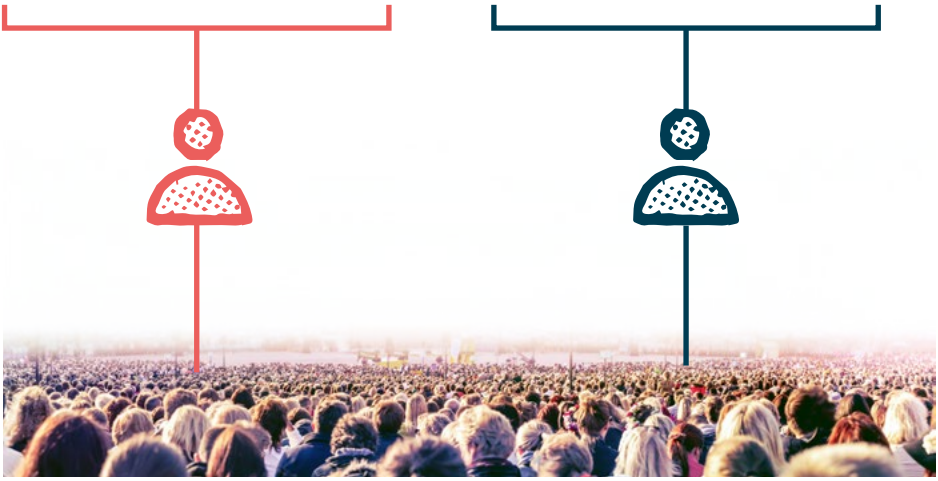
If they can, your eyecare professional will remove or treat the cause of your high eye pressure. For example, they may give you eye drops to reduce swelling in your eye. Often, eye pressure goes back to 'normal' after the cause is treated.

Sometimes your eyecare professional will also directly treat your high eye pressure.

Developmental glaucoma

Around 1 in 20,000 babies are born with glaucoma.

A similar number of children develop it later.



This is called developmental, congenital, infantile or childhood glaucoma.

Developmental glaucoma happens when your eye does not develop properly. Developmental glaucoma may happen by itself (primary) or due to other eye or health conditions (secondary).

How might glaucoma affect what I see?

Glaucoma affects everyone differently. People who notice glaucoma vision loss often describe blurry or misty patches in their vision.

Most people cannot tell they have glaucoma.

Glaucoma vision loss usually starts in your off-centre (peripheral) vision. Central vision is clear for much longer. You use central vision for detailed tasks like reading, watching TV and looking at faces. You use off-centre (peripheral) vision for driving, getting around and seeing things at the edge of your vision.

Your two eyes work together. If you have a gap in your vision in one eye, your other eye might make up for it. You might only notice misty or blurry patches when you close one eye. Even then, your brain might fill in the gaps, so what you see looks complete.

Examples of what you might see if you have full vision, moderate glaucoma and advanced glaucoma

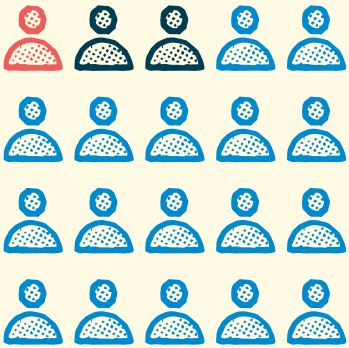
Most people with glaucoma keep good vision for life.

If your glaucoma does lead to vision loss, you might start to notice for example that:

- You trip over things on the floor.
- You find it harder to see things with poor colour contrast.
- It's harder or takes you longer to find what you're looking for.
- Cars seem to suddenly appear from nowhere.

Most people **do not** go blind with glaucoma.

On average across all forms of glaucoma, out of 20 people with glaucoma:



Only around **one** develops severe vision loss.

Around **two more** develop vision loss that affects day-to-day activities like driving.

Around **seventeen** barely notice vision loss.

These numbers might be better or worse for some forms of glaucoma.

Thanks to modern treatments, fewer people lose their vision due to glaucoma now than in the past.

Most people who have severe vision loss due to glaucoma were diagnosed late or had other underlying health or eye conditions. It's unusual to lose all vision due to glaucoma. But because vision loss is possible, it's important to go to all your eye clinic appointments and to use any treatment as prescribed.

Who gets glaucoma?

Anyone can develop glaucoma, but some people are more likely to than others.

Age

Glaucoma gets more likely as you get older. In the UK, glaucoma is uncommon below the age of 40 years.

≈ 

About 2 in 100 people over 40 have glaucoma.

≈ 

About 10 in 100 people over 80 have glaucoma.

Family history

If you have a close blood relative (brother, sister, parent or child) with glaucoma, you are more likely to develop it yourself. How much more likely depends on the form of glaucoma and how close the relative is. As a rough guide, it may be up to 10 times more likely. For example:

≈ 

Around 2 in 100 people have primary open angle glaucoma (POAG).

≈ 

But around 20 in 100 people who have a sibling with POAG also have it.

Ethnicity

If you're of Black African origin, you may be up to four times more likely to develop **primary open angle glaucoma (POAG)** than people of European origin.

Up to 8 in 100 people of Black African origin may have POAG

compared to around 2 in 100 people of European origin.

If you're of Black African origin, you're also more likely to get POAG younger and to lose vision.

If you're of Asian origin you're a little over twice as likely than people of European origin to develop **primary angle closure glaucoma (PACG).**

Around 10 in 1,000 people of Asian origin have PACG, compared to around 4 in 1,000 people of European origin.

Short or long sight

If you have extreme short sight, you may be at increased risk of developing open angle glaucoma.

If you have long sight, you may be at increased risk of developing angle closure glaucoma.

Diabetes

If you have diabetes, you may be at increased risk of developing glaucoma. However, it's unclear whether there is a direct link.

If you have diabetes, you should have both routine eye tests and diabetic eye screening because these check for different things.

What tests will I have?

You'll have several tests for glaucoma.

You may have had some of these tests during routine visits to your local high street optician.

For example: How well can you see detail at a distance?

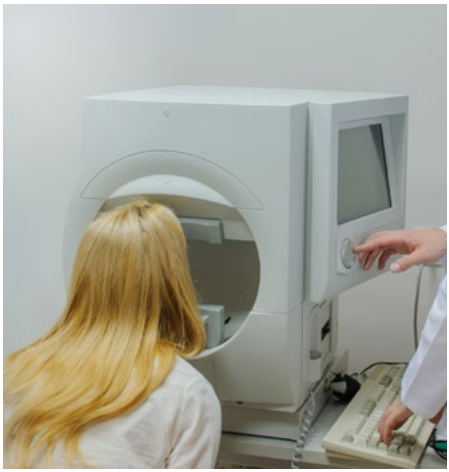
This is called visual acuity.

▲ Visual acuity test

Where can you see things?

If you look at something straight ahead and keep your eye still, how far up, down, left and right can you see? Are there patches of vision loss?

This is called your visual field. If you have glaucoma, you'll have patches of vision loss, usually starting in your peripheral (off-centre) vision.

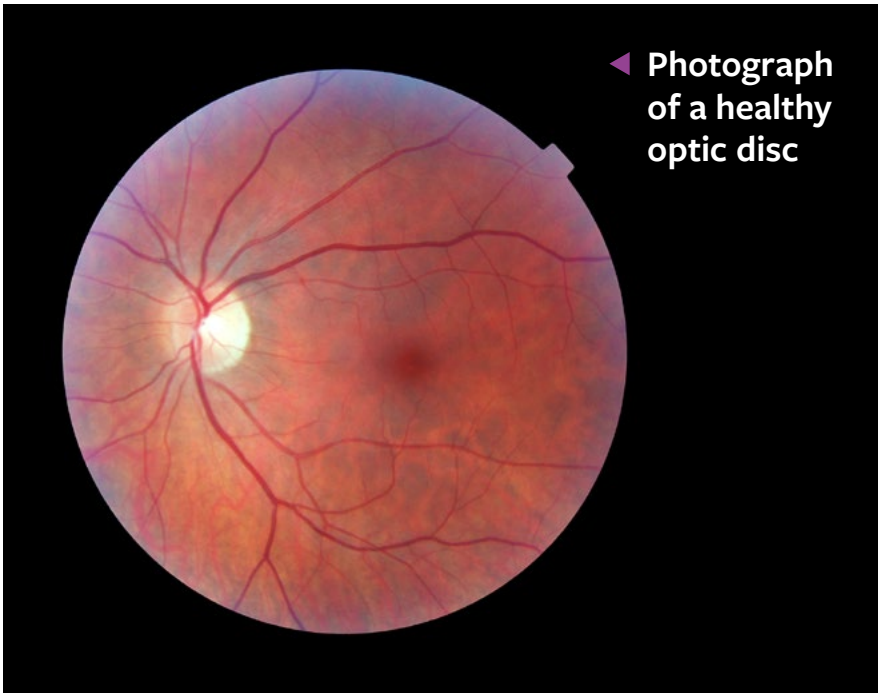


▲ **Visual field test machine**

What's your eye pressure?

If your eye pressure is high, you're more at risk of glaucoma.

▲ **Tonometer for measuring eye pressure**



Photograph of a healthy optic disc

Are there any signs of possible damage to your optic nerve where it leaves your eye (the optic disc)?

Your eyecare professional may scan or photograph the back of your eyes so that there's a record to compare against at future appointments. Signs of possible damage to your optic disc could be glaucoma.

Other tests you may not have had at routine visits to your local high street optician.

For example:

How thick is your cornea (the clear window at the front of your eye)? The thickness of your cornea helps the eyecare professional make sense of your eye pressure.

What does your drainage angle look like? Can aqueous flow freely through your eye and drain away? This check is called gonioscopy. In angle closure glaucoma, your drainage angle is narrowed or closed. In open angle glaucoma, your drainage angle is open.

These tests may be done by an optometrist, nurse or other eyecare professional. An optometrist is an eyecare professional trained to check eye health and measure vision. An ophthalmologist checks the test results. An ophthalmologist is a doctor specialising in eye and vision care.

The ophthalmologist should tell you:

- If you have glaucoma
- How much vision loss you have, if any
- The form of glaucoma you have
- A plan for treatment

The ophthalmologist should also answer any questions you have about your glaucoma and what you need to do.

Sometimes, the ophthalmologist needs more information to decide whether you have glaucoma. If so, they'll ask you back for another appointment to repeat the tests. They may say that you have suspected glaucoma. This may happen if your results are borderline, for example if your eye pressure is a bit high or your optic disc looks like it might have early signs of damage.

If you have glaucoma, you'll need to have regular appointments to check your eyes and how well treatment is working for you. These follow up appointments may be at a hospital or in a community setting such as a high street optician or GP practice.

What treatment might I have?

There are lots of treatment options to lower eye pressure and slow down possible future vision loss.

But treatment does not cure glaucoma, and any vision loss from glaucoma is permanent. This can be difficult to come to terms with.

Our helpline is there for you to talk through how you're feeling as well as the practical side of things.

01233 648 170

Monday to Friday 9.30am to 5.00pm

helpline@glaucoma.uk

Your eyecare professional will suggest treatment based on your test results and the form of glaucoma you have. They'll also take account of other things like your health, your age and your preferences.

Eye drops

Eye drops are a common treatment for glaucoma. Some eye drops reduce how much aqueous your eye makes. Others help aqueous drain out of your eye.

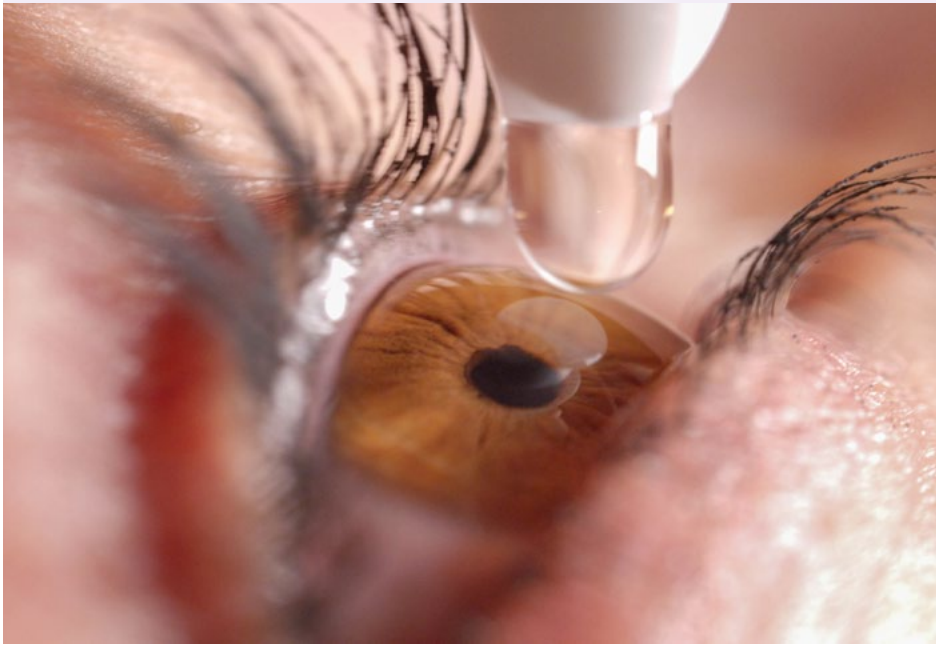
If your eyecare professional asks you to use eye drops, you'll usually need to use them every day for life. You might need to use one or more kind of eye drop.

Like all medicines, eye drops can have side effects. Red, sore or itchy eyes are common side effects of using eye drops.

If you get side effects talk to your eyecare professional. Ask about using preservative-free eye drops or if another treatment may be suitable. Try using lubricating eye drops, ointments or gels to soothe your eyes. Keep using your eye drops unless told to stop by your eyecare professional.

If you get side effects that worry you, contact your eye clinic as soon as you can.

Putting your eye drops in every day is one of the most important things you can do to protect your vision.



Laser treatment

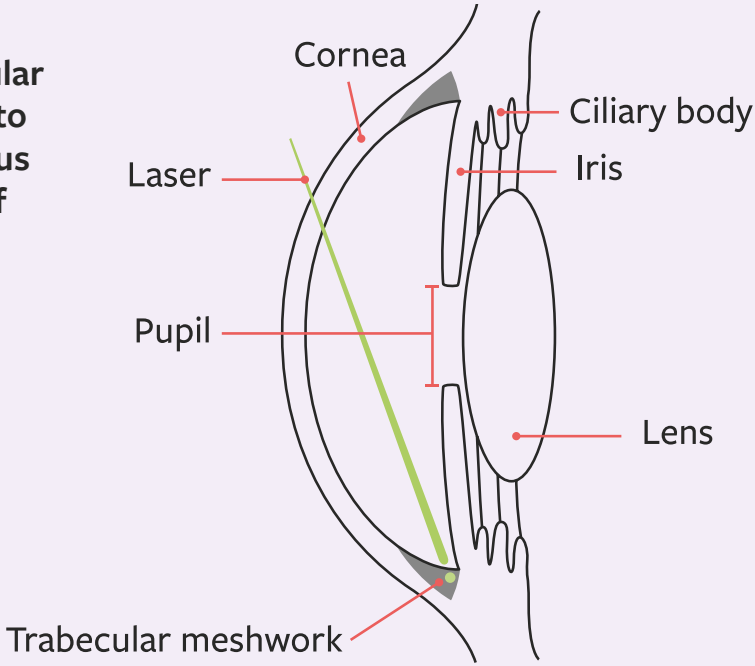
There are several laser treatments for glaucoma. Which laser treatment, if any, is right for you depends on the form and severity of your glaucoma. How long you've had glaucoma may also make a difference.

▲ **An example of SLT treatment.** Photograph provided by and used with permission from Zeiss, www.zeiss.co.uk

Laser treatment for primary open angle glaucoma

Selective laser trabeculoplasty (SLT) is a common treatment for primary open angle glaucoma (POAG). An eyecare professional aims a laser beam at your drainage channels (known as the trabecular meshwork) to help the flow of aqueous out of your eye. Most people find SLT painless. SLT takes around 10 minutes per eye, and is done at the eye clinic.

SLT targets the trabecular meshwork to help aqueous drain out of your eye ▶



SLT may lower your eye pressure enough by itself, or you may need eye drops as well. If you need eye drops, you may need fewer than you'd have needed without SLT.

SLT typically lasts for a few years. After that the effect can wear off. When it stops working so well, you can usually have SLT again.

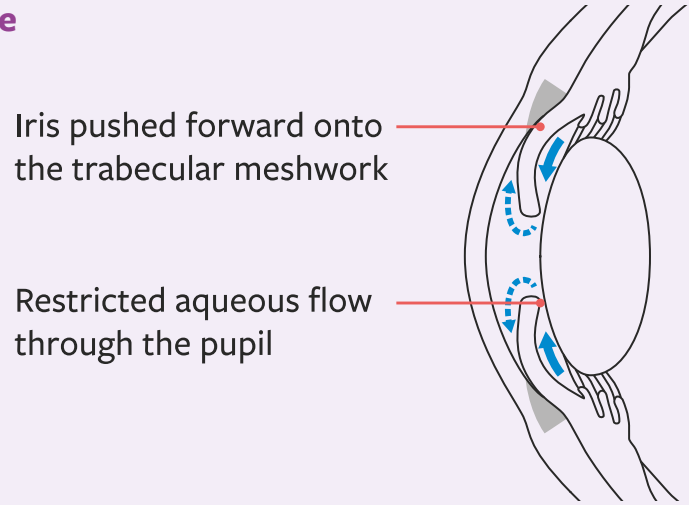
Laser treatment for primary angle closure glaucoma

Laser iridotomy is a common treatment for primary angle closure glaucoma. It's sometimes also used to prevent angle closure glaucoma in people who are at high risk of it.

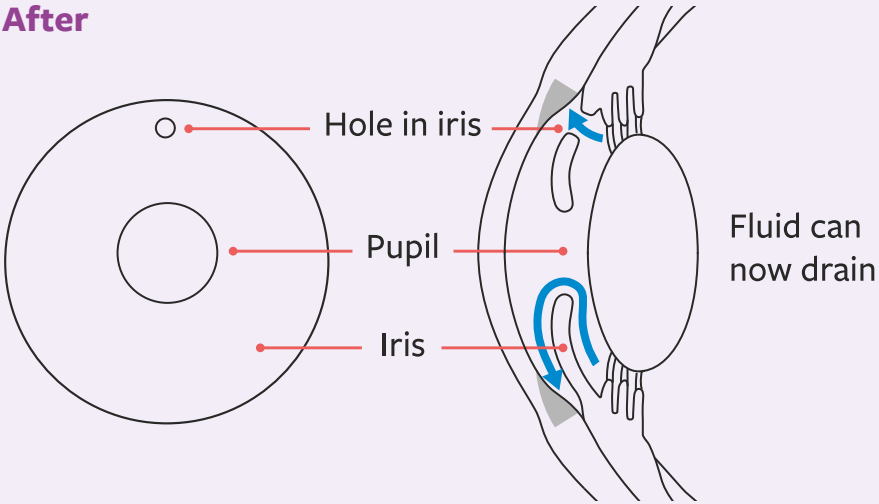
An eyecare professional aims a laser beam at your iris to make a hole. This helps aqueous fluid flow through your eye, and helps to keep your drainage angle open. Laser iridotomy is done in an eye clinic.

▼ Laser iridotomy helps aqueous drain out of your eye

Before



After



Surgery

Most people with glaucoma will not need surgery. However, surgery can be an effective treatment, especially for people with more advanced or severe glaucoma.

Trabeculectomy

The most common form of surgery for glaucoma is trabeculectomy. Your eye doctor makes a tiny flap over a small hole in the outer wall of your eye. This makes a new drainage route for aqueous to drain out of your eye, lowering your eye pressure.

Shunt or tube surgery

Another form of surgery is tube or shunt surgery. Your eye doctor puts a small tube into your eye to create a new drainage route.

Replacing your lens

If you have primary angle closure glaucoma, your eye doctor may replace the lens in your eye with an artificial one.

Because the new lens is thinner than the old one, there's more space in your eye and your drainage angle can open. This may lower your eye pressure.

If your lens is cloudy, this surgery is called cataract surgery. If your lens is clear, it's called clear lens extraction.

Minimally Invasive Glaucoma Surgery (MIGS)

In minimally invasive glaucoma surgery (MIGS), your eye doctor puts a tiny device or makes a small cut into your eye's drainage channels. It helps aqueous drain out of your eye.

Your eye doctor may suggest MIGS if:

- your eye pressure is too high even after laser treatment or eye drops;
- you struggle with eye drops;
- you're having cataract surgery.

MIGS is minor surgery with fewer risks and faster recovery than other forms of glaucoma surgery. But MIGS tends to lower eye pressure less.

No treatment

You may decide against having any treatment even if your eyecare professional recommends it. **This increases your risk of vision loss due to glaucoma.**

Whether or not you have treatment, you should go to follow-up appointments and routine eye tests.

What if my eye pressure stays high?

There are lots of treatments for glaucoma. For most people, there is at least one that will lower eye pressure.

If one treatment fails to lower your eye pressure, your eyecare professional may try another. It may take time to find the right one for you. As your glaucoma changes, the best treatment for you may also change. Everyone is different.

How do I use eye drops?

Always read the patient information leaflet that comes with your eye drops. It has important information about how to store and use your drops and about possible side effects.

It's common to find it hard to put in eye drops. There are lots of ways to put eye drops in, and lots of aids that can make it easier. For help, contact our helpline or ask a healthcare professional such as a nurse, eye care liaison officer, pharmacist or optometrist.

Top tips:

- Wash your hands before and after using your eye drops.
- If you wear contact lenses, take them out before putting in your eye drops. After putting in your eye drops, wait 15 minutes before putting your contact lenses back in.
- If two drops go into your eye, that's okay.
- After putting in your eye drops, gently close your eye. With a finger, press lightly on the corner of your eye near your nose for a couple of minutes. This blocks your tear duct, and helps keep the eye drop in your eye where it's needed.

- **More than one kind of glaucoma eye drop?** Wait 5 minutes between each one.
- **Glaucoma drops and dry eye drops?** Wait 15 minutes between each one.

Is it okay to drive with glaucoma?

Driving is important to many people, but you need to be safe on the roads.

You must tell the DVLA (in England, Scotland or Wales) or the DVA (in Northern Ireland) if:

You drive a car or motorcycle, and you have glaucoma in both eyes.

You drive a bus, coach or lorry, and you have glaucoma in one or both eyes.

The DVLA or DVA will ask you to take a special visual field test at a high street optician. This test checks you meet the minimum vision standards for driving.

Most people with glaucoma meet the minimum vision standards for driving.

You should also check with your motor insurer whether you need to tell them about glaucoma.

Further help and information from Glaucoma UK

We offer other free information booklets on a range of topics, including:

- **Different types of glaucoma**
- **Treatments such as eye drops, laser treatments and surgery**
- **Driving and glaucoma**

For a full list of available booklets and to order or download them, visit our website or contact our helpline.

As well as our information booklets, helpline and website, there are lots of other ways we can help you to live well with glaucoma.

Some examples of our services are:

- **Buddy scheme**
  If your eyecare professional recommends laser treatment or surgery, we can pair you up for a chat with someone who's already had the treatment.
- **Glaucoma support groups**
  Find out more about glaucoma, share information, and ask questions. Visit our website or call our helpline to see if there's a group near you and to find out about online groups.
- **Health Unlocked**
  Join our online forum and talk to other people with glaucoma. Visit **healthunlocked.com/glaucoma-uk** to get involved.

For more information, to get involved or to give us feedback contact our helpline, visit **www.glaucoma.uk/more** or scan the QR code.

About Glaucoma UK

Glaucoma UK is the charity for people with glaucoma. We raise awareness of the risks of glaucoma, and offer help and support to people living with the disease.

We fund high-quality research into prevention, diagnosis, treatment and, hopefully one day, a cure. We also work with professionals to influence policy and practice with the goal of improving services. Our aim is to end preventable glaucoma vision loss.

Raising awareness

Helping people understand why they may be at risk of glaucoma.

Providing support

Ensuring people can access reliable help and advice when and how they need it.

Influencing policy and professional practice

Advocating for glaucoma patients with those who develop policy, commission services and deliver care.

Supporting research and development

Funding high-quality research into glaucoma prevention, diagnosis, treatment and cure.

Keep in touch

We'd love to keep in touch.

Visit our website to sign up for our email newsletter to hear more about our work and how we can help you.

Join Glaucoma UK

Join Glaucoma UK and become a member of our supportive glaucoma community.

You'll receive exclusive benefits, including our magazine full of news and information about glaucoma.

Find out more at **www.glaucoma.uk/membership** or call **01233 648 164**.

Disclaimer

The information in this booklet was correct at the time of last review and is intended as a general guide only. Always ask an eyecare professional or doctor for advice specific to you.

A list of sources is available on request.

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With thanks to our contributors and reviewers

- Professor Anthony King, Honorary Professor of Clinical Ophthalmology, University of Nottingham
- Professor Philip Bloom, Consultant Ophthalmic Surgeon, Imperial College Healthcare NHS Trust
- Volunteers on our readers' panel

Trusted Information Creator

Patient Information Forum

Glaucoma UK
Kent House
81 Station Road
Ashford
Kent TN23 1PP

Phone: **01233 648 164**
Email: **info@glaucoma.uk**
Website: **glaucoma.uk**

Glaucoma UK helpline

01233 648 170
Monday to Friday 9.30am to 5.00pm

Email: **helpline@glaucoma.uk**