

Glaucoma (Primary Open Angle)

In primary open angle glaucoma there is damage to the optic nerve. It is usually caused by an increase in eye pressure. Treatment to reduce eye pressure can prevent, or delay, glaucoma from getting worse. All adults over 35-40 should have regular eye checks to detect early glaucoma.

What is glaucoma?

Glaucoma is an eye condition where the nerve at the back of the eye (the optic nerve) is damaged. This can lead to loss of vision. In most cases, the damage to the optic nerve is due to an increased pressure within the eye. There are different types of glaucoma.

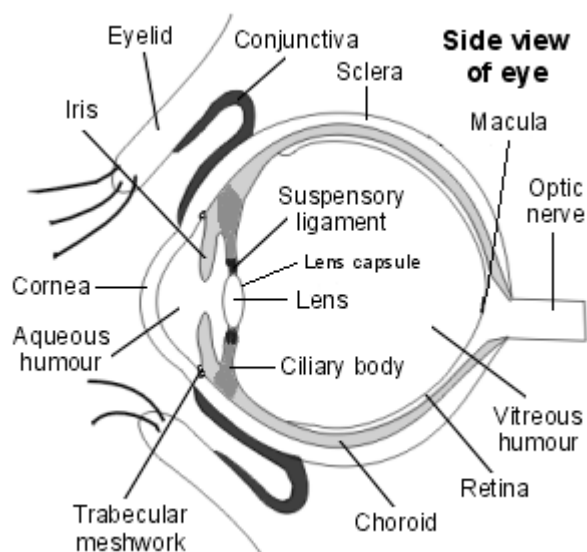
- **Primary open angle glaucoma** (also called chronic glaucoma) is the most common type. This develops slowly so that any damage to the nerve and loss of sight is gradual. The term 'open angle' refers to the angle between the iris and sclera which is normal, in contrast to:
- **Acute angle closure glaucoma** where the angle is narrowed. This is uncommon. In this condition there is a sudden increase in the pressure within one eye. The eye quickly becomes painful and red.
- **Secondary glaucoma** is caused by various other eye conditions which can cause a rise in the pressure within the eye. For example, glaucoma may develop as a 'secondary' complication to some eye injuries.
- **Congenital glaucoma (buphthalmos)** is where glaucoma is present from birth.

The rest of this leaflet deals only with primary open angle glaucoma.

The eye and aqueous humour

The eye needs to keep its shape so that light rays are focussed accurately onto the retina. So, the bulk of the eye is filled with a jelly like substance called the vitreous humour. But, in front of the lens the eye is filled with a clear fluid called aqueous humour.

Aqueous humour is made by cells that line the ciliary body. This fluid fills the front of the eye and gives a little outward pressure to maintain the shape of the eye. Aqueous humour also contains oxygen and sugars to nourish parts of the eye.



The aqueous humour drains out from the eye into the bloodstream through the sieve-like trabecular meshwork. This is near the base of the iris. So, there is a constant production and drainage of aqueous humour.

What happens in primary open angle glaucoma?

In primary open angle glaucoma (just called 'glaucoma' from now on) there is a partial blockage within the trabecular meshwork. This restricts the drainage of aqueous humour. The reason why the trabecular meshwork becomes blocked and does not drain well is not fully understood. The pressure of the aqueous humour builds up if the drainage is faulty. But, this also increases the pressure on the back of the eye.

The increased pressure in the eye can damage the optic nerve (the main nerve of sight) and the nerve fibres running towards it from the retina. The retina contains the 'seeing' cells at the back of the eye. The damaged parts of the nerve and retina lead to permanent patches of vision loss. In some cases this can eventually lead to total blindness.

What is the difference between increased eye pressure and glaucoma?

Glaucoma means that part of the optic nerve is damaged, usually caused by increased eye pressure. But, about 1 in 5 people with glaucoma have eye pressures in the normal range. This is called 'normal pressure glaucoma'. In this condition the optic nerve is damaged by relatively low eye pressures. Other factors such as a poor blood supply may make the optic nerve sensitive even to modest pressure. In contrast, some people have an increased eye pressure with no ill effect to the optic nerve.

However, as a rule, if your eye pressure is high you have a much increased risk of developing glaucoma and visual loss.

Who gets primary open angle glaucoma?

In the UK, about 1 in 50 people over 40 have glaucoma. It is unusual in people under the age of 35. It becomes more common with increasing age. Glaucoma can affect anyone, but it is more common if you:

- Have a family history of glaucoma.
- Have very short sight.
- Have diabetes.
- Are from African or Afro-Caribbean origin.

What are the symptoms of primary open angle glaucoma?

At first there are usually no symptoms. There is no pain or redness in the eye. Most people with glaucoma do not notice problems until quite a bit of visual loss has occurred. This is because the first part of the vision to 'go' is the outer (peripheral) field of vision. Central vision, used to focus on an object such as when we read, is spared until relatively late in the disease. Also, although glaucoma usually affects both eyes, it may not affect them equally. The better eye may 'fill in' for a while if the other eye starts to lose patches of visual field.

Some elderly people with glaucoma put their gradual failing vision down to 'just getting old'. They might not have had their eyes checked for many years and may needlessly lose their sight. Untreated glaucoma is one of the world's leading causes of blindness.

But, blindness can be prevented if glaucoma is diagnosed and treated early enough.

Who should be tested for glaucoma?

Everyone aged over 35-40 should have an eye check by an optometrist at least every 5 years. A check every 2-3 years is advised if you are over 50. Eye checks are particularly important if you are in any of the 'at risk' groups listed above. The eye check will detect early signs of glaucoma before any significant vision loss occurs. The eye test normally includes:

- measuring the eye pressure.
- a look at the back of the eye with a special torch.
- checking the field of vision.

People aged over 40 with a first-degree relative (mother, father, brother, or sister) with glaucoma are entitled to free eye tests.

What is the treatment for primary open angle glaucoma?

The aim of treatment is to lower the eye pressure. If the eye pressure is lowered, further damage to the optic nerve is likely to be prevented or delayed. The eye pressure to 'aim for' varies from case to case. It partly depends on how high the original pressure is. Your eye specialist will advise. Eye pressure can be lowered in various ways

Eye drops

A variety of eye drop can lower eye pressure. They work either to:

- Reduce the amount of aqueous humour that you make
- Increase the drainage of aqueous humour.

Your eye specialist will advise. Some drops work better in some people than in others. Some drops are not suitable if you have asthma. Also, the possible side-effects vary between the different types of drops. So, if the first does not work so well, or does not suit, another may work fine. In some cases, two different types of drops are needed to keep the eye pressure low.

It is vital to use your drops exactly as instructed. If you are unsure that you are using your drops correctly, ask for advice from your doctor or practice nurse. An eye specialist will keep a regular check on your eye pressures, optic nerves, and field of vision.

Tablets

These are sometimes used. They work by reducing the amount of aqueous humour that you make.

Surgery

An operation called trabeculectomy is an option. This involves creating a channel between just inside of the eye to just under the conjunctiva. So, the aqueous humour can bypass the blocked trabecular meshwork. In effect, it is like forming a small 'safety-valve' for the aqueous humour.

Surgery may be advised if a trial of eye drops has failed to achieve target eye pressures, especially in younger people, or if you have very high eye pressures.

Like with all operations, there is a small risk of complications. Also the operation may have to be repeated in some cases. This is usually because some scar tissue forms at the site of the channel and prevents it working to drain the aqueous humour.

Laser treatments

A laser can 'burn' the trabecular meshwork which improves the drainage of the aqueous humour. Another technique is to destroy parts of the ciliary body which reduces the amount of aqueous humour that is made. However, the reduction in eye pressure after laser treatments often only lasts a short time. So, laser treatments are not commonly done.

Further information and help

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