

Patient Information

Glaucoma and monitoring tests

Introduction

This leaflet explains more about glaucoma and the tests used to diagnose and monitor it.

What is glaucoma?

Glaucoma is a condition which can affect sight, usually due to a build-up of pressure within the eye.

It often affects both eyes, usually to varying degrees. One eye may develop glaucoma quicker than the other.

In some people, the pressure may be normal, but damage still occurs because of weaknesses of the optic nerve.

A diagnosis of glaucoma is given if you have damage to your optic nerve.

What causes pressure within the eye?

A fluid (called aqueous humour) is produced inside the eye by a layer of cells on the muscle that moves the lens in the eye. The fluid is needed to:

- Provide nutrients to the front of the eye, especially the cornea and lens that have no blood vessels.
- Remove waste products from the eye.

The fluid drains mainly through a structure called the trabecular meshwork. This meshwork lies in the angle where the cornea meets the iris.

The normal pressure in the eye is between 10 and 24 millimetres of mercury (mmHg). If for any reason the fluid is blocked and cannot get out, the pressure can rise and glaucoma may occur.

What types of glaucoma are there?

There are two main types of glaucoma:

- Open-angle
- Narrow-angle

Both types may happen by themselves, which is known as primary glaucoma, or as a result of another eye condition, known as secondary glaucoma.

Open-angle glaucoma

Open-angle glaucoma is more common and affects two per cent of adults over 40. It is more likely to happen

- With increasing age – it affects 10 per cent of those over 75.
- In African races.
- In those who are very short-sighted.
- In those with diabetes.
- In those with family history of it.
- In those who have used steroids for a long time.

This type of glaucoma is when the drainage channel is open. Its exact cause is unknown. Although the drainage angle is open and appears normal when examined, research has found that there is resistance to fluid draining out at the trabecular meshwork.

This resistance to drainage causes the pressure to rise, which causes damage to the optic nerve. This damage is possibly caused by the force of the pressure or reduced blood supply to the nerve.

Open-angle glaucoma often develops gradually over time and affects both eyes. People frequently do not realise their sight is being damaged because the first part of the eye to be affected is the outer field of vision (peripheral vision).

The danger of this condition is that the eye seems perfectly normal and the loss of vision is so gradual and painless that people are often unaware of it until the damage is considerable and permanent.

At first, the damage to vision tends to be in the shape of an arc, either a little above or below the centre of the field of vision.

If untreated, this progresses until most of the outer field of vision is lost and there is only a small central tunnel of vision left. Eventually, this too can be lost, causing complete blindness.

As most patients have few or no symptoms, it is important to have your eye pressure checked regularly, especially if there is a family history of glaucoma.

Narrow-angle glaucoma

This is where the drainage angle between the cornea and iris becomes closed.

With this type of glaucoma, there will be symptoms such as colour haloes, a headache or brow ache. There may possibly be more severe symptoms of an acute attack, including pain, nausea (feeling sick) and reduced vision.

This is an eye emergency and needs to be checked urgently at either an eye emergency clinic or an emergency department, preferably at an eye hospital.

What tests are used to diagnose glaucoma?

There are several glaucoma tests, and they are often carried out during the same appointment to ensure results are as accurate as possible. They are painless and quite quick.

Optic nerve assessment

The optic nerve is usually examined using a slit lamp, which is a microscope with a very bright light. You will need to put your head in a headrest. The ophthalmologist will look at your eyes using the light and a lens held near to your eye.

We may have to use eye drops to widen the pupils of your eyes so that we can get a clear view. The eye drops can make your sight blurry for a while, so we advise you **not to drive to this appointment**. People who have glaucoma often have an optic nerve which looks abnormal where it has been damaged.

Eye pressure test

Measurement of the pressure within the eye is called tonometry. It uses an instrument called a tonometer to measure the pressure inside your eye.

The ophthalmologist will put some drops of anaesthetic (a painkilling medication) into your eye. Then, yellow / orange dye is used to temporarily stain the tears. You will need to put your head in a headrest, and then the ophthalmologist will shine a blue light on your eye.

We use a small, round, flat instrument to painlessly flatten the cornea of your eye. We can measure the pressure of your eye by how much the cornea flattens.

Central corneal thickness measurements

This is performed by anaesthetising the eye with drops and placing a small ultrasonic probe on the centre of your cornea for a few seconds. The measurements from this can help the ophthalmologist check how accurate the pressure values were from the eye pressure test.

Examination of the drainage angle

To do this examination, we put anaesthetic drops into your eye, and then put a contact lens on your eye. This allows your ophthalmologist to see in the angle between the cornea and iris, to see if it is open or closed. They will also examine the trabecular meshwork where the fluid drains out of your eye.

Other tests

Other tests that are sometimes used to diagnose or monitor people with glaucoma are as follows:

All day measurements of eye pressure (phasing)

Eye pressure can vary a great deal throughout the day and is often higher in the early morning. Therefore, we may need to assess the pressure every two hours over an eight to 24 hour period. This is called phasing. It is useful if your eye pressure is borderline or if glaucoma is progressing even though you have normal eye pressure measurements.

Visual field test

A visual field test is sometimes called perimetry. It checks for missing areas in the field of vision and can be used to monitor progression of glaucoma.

For the test, you will need to put your head in a headrest. You will be shown a series of lights on a screen, and you will need to press a buzzer when you see one. Some dots will appear in your peripheral vision (around the sides of your eyeball), which is where glaucoma begins. One eye is tested at a time.

If you cannot see the spots in your peripheral vision, it may mean that glaucoma has damaged your vision.

Three-dimensional (3D) scanning of the optic nerve

A quick and painless scan can be performed of the optic nerve using various specialised scanning systems, including Heidelberg Retinal Tomography and Optical Coherence Tomography. This can produce an accurate 3D image of the optic nerve and retinal nerve fibres. It can be useful in monitoring glaucoma in some patients.

Please note: due to the ongoing COVID-19 pandemic, it has been necessary to make changes to the way we run our clinics. Your consultant has undertaken a detailed review of your medical records and has made a clinical decision on what are the most important diagnostic tests for you to have at this time. You have been allocated to a clinic based on the tests you require, and these clinics are as follows:

VGC1 – this involves a visual acuity check followed by a measurement of the pressure in your eyes. This will most likely be done with a "puff of air", but other methods of pressure measurement are available should this be required.

VGC2 – this involves a visual acuity check, scans and photos of the back of the eye, and a measurement of the pressure in your eyes.

VGC3 – this involves a visual acuity check, a visual field test and a measurement of the pressure in your eyes.

VGC4 – this involves all tests in VGC1 to VGC3.

This means your visit may last anywhere between 10 minutes to an hour, depending on the clinic you have been booked into.

All of your results will be reviewed by an ophthalmologist or an advanced glaucoma practitioner who will then be in touch with you via a letter or telephone call to inform you of the outcome and the future management of your case.

Thank you for assisting us in keeping our staff and patients safe at this time.

What if I have any problems or questions after reading this leaflet?

If there is anything you do not understand, or you are concerned or worried about any part of the treatment, contact:

The **Urgent Referral Clinic** team at Russells Hall Hospital Eye Clinic on **01384 456111 ext. 3633**.

Eye emergency, out of hours

In case of an eye emergency after the closing hours of the Eye Clinic at Russells Hall Hospital (including weekends and bank holidays), please contact:

Birmingham and Midland Eye Centre on **0121 507 4440**

The doctor on call is usually based at the Eye Centre, City Hospital, Dudley Road, Birmingham. They may need to call you back, and if necessary, they will arrange for you to visit them.

Note: the information in this booklet is provided for information only. The information found is **not** a substitute for professional medical advice or care by a qualified doctor or other health care professional.

Always check with your doctor if you have any concerns about your condition or treatment. This is only indicative and general information for the procedure. Individual experiences may vary and all the points may not apply to all patients at all times. Please discuss your individual circumstances with your eye doctor.

Where can I find out more?

The Royal National Institute of Blind People (RNIB) booklet, 'Understanding Glaucoma', contains more information. You can also visit the RNIB website:

<http://www.rnib.org.uk/eye-health-eye-conditions-z-eye-conditions/glaucoma>

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This leaflet can be downloaded or printed from:

<http://dgft.nhs.uk/services-and-wards/ophthalmology/>

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