Living with Glaucoma



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OF OCULAR SURFACE
& GLAUCOMA

Glossary of terms







Intraocular pressure (IOP) – The pressure of the eye caused by fluid inside.

Optic nerve – The nerve which transmits signals to your brain, allowing you to see. It runs from the back of your eye (retina) to your brain.

Aqueous humour – The clear fluid which fills the space between the lens and the cornea.

Lens – The lens is close to the middle of your eye and helps to create a clear image of objects in front of you.

Cornea – The transparent layer at the front of your eye.

Ocular hypertension – When the pressure in your eye **(see intraocular pressure, above)** is above the normal range.

Laser surgery – A type of surgery which uses a laser to make cuts.

Microinvasive glaucoma surgery (MIGS) – A type of surgery which uses very small incisions to treat glaucoma.

Contrast sensitivity – How well your eyes can detect the difference between different objects and their surroundings.

Visual field – The total area in which you can see objects.

Peripheral visual field – The part of your visual field which is outside the centre of your gaze.

WHAT IS GLAUCOMA?

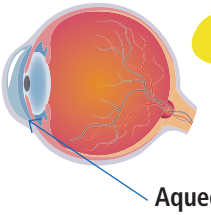


Glaucoma is a chronic disease which causes a build-up of fluid in your eyes, increasing the **intraocular pressure** (IOP). This pressure affects your **optic nerve** and if untreated can cause irreversible damage and even blindness. Glaucoma can be treated with eyedrops, laser or sometimes surgery. It is therefore very important that patients with glaucoma are correctly diagnosed and treated.

Glaucoma is the second leading cause of blindness in the world[1]. However, most people with glaucoma do not lose their vision[2].

Please read through this leaflet and do not hesitate to consult your ophthalmologist or glaucoma specialist nurse if you have any further questions.

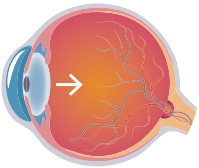
GLAUCOMA EXPLAINED IN 3 STEPS

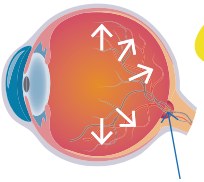


1 Due to an imbalance between fluid coming in and going out, a fluid called **aqueous humour** builds up around the inside area of the eye.

Aqueous humour

2 The build-up of aqueous humour increases the pressure and the IOP.





3 The elevation in IOP could pressurise the optic nerve and damage the fibres. This can cause a gradual decline in vision, which could lead to irreversible loss of vision if left untreated.

Optic nerve

What are the risk factors for developing glaucoma?

- Advanced age, in particular over 60 years of age[3]
- Being treated with topical corticosteroids[4,5]
- Having a family history of glaucoma, inflammatory eye disease or ocular hypertension[6]
    - People with an immediate family member who has glaucoma have a 9-fold greater risk of developing glaucoma[7]
- Your ethnicity: people of African, Caribbean or Asian origin are at a higher risk[7]
- Being short-sighted (myopia)[7]

Different types of glaucoma

There are several different types of glaucoma, and your treatment will depend on your type and stage of glaucoma. You can find out more about different types of glaucoma on page 18 of this leaflet.

WHAT CAN VISION BE LIKE WITH GLAUCOMA?

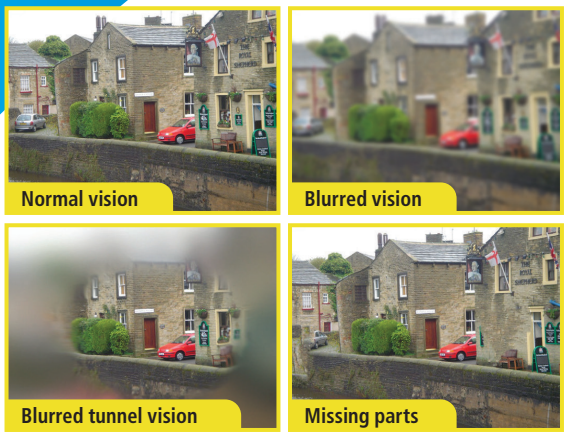


Figure 1. How Does Glaucoma Look?[8]

Initially, small areas of the outer or **peripheral visual field** will disappear slowly; these changes can go unnoticed. You may have difficulties adapting to light changes (for example when going into a tunnel). You may experience symptoms such as headaches or eye pain, red eyes, excessive tearing or blurred vision. However, not everybody has these symptoms, as glaucoma is an insidious disease with approximately 50% of people unaware that they have glaucoma[9].

As glaucoma can develop slowly over many years you may not notice any changes to your vision, as it is often only picked up during a routine eye test.

Will I go blind?

Some people do lose some peripheral vision, but it is uncommon for people to lose their sight entirely[10].

The best way to avoid vision loss is to take your medication every day and attend your regular appointments with your ophthalmologist where your vision will be tested.

Speak to your ophthalmologist if you have any concerns about vision loss.

How is glaucoma diagnosed?

The best way of detecting glaucoma is through having regular eye examinations, as you may not notice any problems with your vision in the early stages.

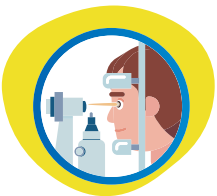


Measuring the intraocular pressure

This is an important test for detecting and monitoring glaucoma. It is painless and very quick.

Examining the iridocorneal angle

The ophthalmologist observes the angle between the eye's cornea and iris. During this test the ophthalmologist can see if this angle is open, closed or obstructed.



Examining and imaging the optic nerve

The ophthalmologist uses a beam of light or photo to look at the optic nerve head. This test is painless.



Assessing the visual field

Your peripheral vision can be affected before you notice any problems, your ophthalmologist will advise that you have a "field test" when necessary. This is non-invasive and painless.

Sitting in front of a screen, you will be asked to press a button when you are aware of any other lights in your peripheral vision. The test will show any weak areas in your vision and can help define the stage and type of your glaucoma.

HOW IS GLAUCOMA TREATED?



Glaucoma is usually treated with eyedrops to lower the IOP. Eye drops can come in single dose vials and in bottles and are preferably preservative-free. Your ophthalmologist will recommend the best type for you.

Why avoid preservatives?

Preservative-free eye drops tend to be more comfortable to put in and may reduce side effects like irritation on the surface of your eyes[11].

Will I need to have surgery?

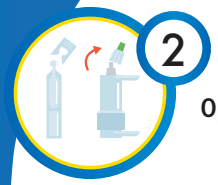
You may be offered surgery to treat your glaucoma. This may include new techniques, such as laser surgery or **micro-invasive glaucoma surgery** (MIGS).

Generally, surgery is offered at more advanced stages of glaucoma, although surgery may be appropriate at an earlier stage in the disease[12,13].

Mode of use – Please ask a healthcare professional to demonstrate to you the best way to apply your eye drops



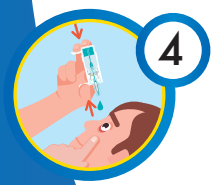
1 Wash your hands properly.



2 Open the single-dose or multi-dose vial.



3 Pull down your lower eyelid.



4 Press the single-dose or the multi-dose vial.



5 Keep your eye closed for 1 minute or press your finger into the inner corner of the eye to improve eye drop absorption and reduce systemic side effects.



6 Discard the single-dose vial or cover the multi-dose vial. Wait 5 minutes before instilling a second drug.

The best protection for your vision is the correct application of your treatment every day







You may not see any difference in vision with your treatment – that is why your regular appointments are so important. Only the ophthalmologist can determine if your treatment is effective.

If you are not comfortable with your eye drops, do not stop using them until you have discussed this with your ophthalmologist. It is not necessary to stop treatment ahead of an appointment with a healthcare professional (HCP) unless instructed to do so.

You might find it helpful to use reminders, such as:



- Taking your treatment as part of your daily routine, such as when you wake up, around mealtimes, and at bedtime.



- Setting an alarm and alerts on devices you keep close, such as your mobile phone, watch, computer or tablet, for reminders throughout the day.



- Or, asking someone to help, like a close family member or a nurse.

"Medication may not work as desired unless it is used as advised by your ophthalmologist".

European Professors of Ophthalmology, ECOS-G

MANAGING YOUR DAILY LIFE WITH GLAUCOMA



Just 60 minutes of meditation a day may be beneficial for people with glaucoma, both physically and mentally[14]. Always ask your ophthalmologist before changing your exercise habits and tell any exercise instructors about your glaucoma.



Due to overall reduction in vision and decreased peripheral vision specifically, glaucoma can increase the risk of falls and accidents[15]. Some simple adaptations in the home, such as marking hazards with bright colours and arranging household items and appliances in a specific way so they are accessible may be beneficial[16].



Greater consideration of surroundings through scanning the entire visual field when moving is also recommended, move your head from left to right, and up and down to cover your entire field of vision before walking, to help identify obstacles such as steps or objects, and then plan your route accordingly[17].



You may notice that you have more difficulty with reading. Sitting in good light can help with this[18]. Handheld magnifying devices enhance labels or text in books, and most web browsers allow the font size and contrast on your computer or tablet to be adjusted to make it easier to read; audiobooks and online audio readers may also be helpful[19,20].

You should always report any changes in your vision to an ophthalmologist.



Glaucoma can cause blurriness or a loss of **contrast sensitivity**, which makes it harder to navigate uneven surfaces or stairs. Improving lighting in your home and moving obstacles from high risk areas – such as hallways and stairs – can reduce your risk of having an accident[17,18]. It is important to avoid extremes of light where possible when undertaking activities; very bright as well as very dark environments can be problematic for glaucoma patients[19,20].

Your ophthalmologist may be able to recommend tinted lenses to help with contrast sensitivity, with many patients enjoying improved vision in environments with fluorescent tubes through yellow, amber or brown tints and improved vision at night with lighter yellow tints.



HEALTHY LIFESTYLE HABITS



Sports

Taking exercise can help you to control IOP* and can be beneficial for your mental health[21,22].

Don't worry if you haven't tried sports before, it's never too late to start[22]!

*for patients with open-angle glaucoma

How can I reduce my risk of developing glaucoma and control IOP?



Doing dynamic exercise such as walking, cycling, running and aerobic exercise[21-23].



Swimming is also encouraged, but you should always swim wearing a diving mask and avoid wearing goggles.

Extreme exercises, such as scuba diving, bungee jumping, maximum exertion activities like weight lifting, and some head-down postures in yoga are not recommended for glaucoma patients[21-25].



DIET

Eat plenty of fruits and vegetables to make sure you have a healthy, balanced diet[26]. Adopting a healthy lifestyle helps to prevent obesity which could have a negative impact on glaucoma[26,27].

Can I reduce my risk of developing glaucoma?

Some recent studies showed that eating a balanced diet could be beneficial for preventing glaucoma[28]. Nutrients such as vitamin A[29], vitamins B2 and B3[29], and omega-3 could be protective against glaucoma[29]. These nutrients are found in fresh carrots, leafy greens, peaches, walnuts and oily fish such as sardines and mackerel.

In any case, it is important to follow the nutritional recommendations. Always inform your doctor before making any changes, however minor, to your diet.



EMOTIONAL AND PSYCHOLOGICAL ASPECTS

It is completely normal to have concerns and fears particularly in the initial weeks following diagnosis; please try not to worry too much because help is available from a variety of sources. Talking to friends and family and utilising your local glaucoma patient association can make a real difference – this can help alleviate any understandable feelings about the uncertainty of being diagnosed with glaucoma and the impact upon your normal activities.

Talking to other people with glaucoma can help to reduce levels of stress that you may be experiencing. Your ophthalmologist will be able to provide you with details of local groups.





FREQUENTLY ASKED QUESTIONS



Does caffeine intake increase the risk of glaucoma?

For some people, more than three cups of coffee per day may increase the risk of developing glaucoma but there is no risk for others[30]. Moderate coffee intake is completely safe[31,32].

Does caffeine worsen my glaucoma?

It is true that caffeine intake increases IOP and may cause damage for those who drink a lot of caffeine[32]. As a precaution, you should avoid caffeine before IOP evaluation, but otherwise, a moderate consumption of caffeine is safe.

NB: caffeine is also contained in tea, some colas and some energy drinks.



Is glaucoma caused by too much television?

Using computers and screens can cause dry eye but does not appear to have any adverse effects on glaucoma[33,34].



Does smoking affect the risk of developing glaucoma?

Only heavy smokers may have an increased risk of glaucoma. However, smoking increases IOP and may influence the progression of visual-field defects in glaucoma[35,36]. Speak to your doctor if you would like help or advice with stopping smoking.



Is sleeping face down worse for glaucoma?

Sleeping face down is not recommended for people with or without glaucoma[36].



Does high blood pressure increase risk of glaucoma?

Both high and low blood pressure should be monitored with caution especially in patients with progressive glaucoma despite controlled IOP[37,38].



Pregnancy

Speak to your ophthalmologist if you are being treated for glaucoma and you are or intend to get pregnant[36].

FURTHER INFORMATION (GLAUCOMA[39])



- **Primary open angle glaucoma** (common) – tends to develop slowly over many years. It is caused by the drainage channels in the eye becoming gradually clogged over time.
- **Acute angle closure glaucoma** – an uncommon type caused by the drainage in the eye becoming suddenly blocked, which can raise the pressure inside the eye very quickly.
- **Secondary glaucoma** – caused by an underlying eye condition, such as inflammation of the eye (uveitis).
- **Childhood glaucoma** (congenital glaucoma) – a rare type that occurs in very young children, caused by an abnormality of the eye.

Your local national glaucoma patient association will be able to provide more information



DON'T FORGET THAT INTRAOCULAR PRESSURE (IOP) IS THE ONLY RISK FACTOR THAT CAN BE CONTROLLED BY:

- Using pressure-lowering eye drops that are preferably preservative-free.
- Using your eye drops as directed by your healthcare professional.
- Embracing simple lifestyle habits.
- Regular ophthalmological examinations.



CONTACT YOUR OPHTHALMOLOGIST IF YOU HAVE ANY QUESTIONS

References

1. D 2019 Blindness and Vision Impairment Collaborators; Vision Loss Expert Group of the Global Burden of Disease Study. Lancet Glob Health. 2020; 9(2):e144-60.
2. Bourne RRA. Vision 2020: where are we? Curr Opin Ophthalmol. 2020; 31(2):81-84.
3. Heijl A. Prevalence and Severity of Undetected Manifest Glaucoma: Results from the Early. Manifest Glaucoma Trial Screening. Ophthalmology. 2013; 120(8):1541-1545. doi:10.1016/j.ophtha.2013.01.043.
4. Renard JP. High blood pressure-low ocular pressure: the parallels. Vascular risk factors in glaucoma. [Article in French] J Fr Ophtalmol. 2007; 30(5 Pt 2):3S18-21.
5. Kersey JP, Broadway DC. Corticosteroid-induced glaucoma: a review of the literature. Eye (Lond). 2006 Apr; 20(4):407-16.
6. Friedman DS. et al. An evidence-based assessment of risk factors for the progression of ocular hypertension and glaucoma. Am J Ophthalmol. 2004; 138(3 Suppl):S19-31.
7. McMonnies C. Glaucoma history and risk factors. J Optom. 2017; 10(2):71-78. doi:10.1016/j optom.2016.02.003.
8. Crabb D, et al. How does glaucoma look?: a patient perception of visual field loss. Ophthalmology. 2013; 120(6):1220-6.
9. National Eye Institute. 2020. Glaucoma. [ONLINE] Available at: https://www.nei.nih.gov/learn-abouteye-health eye-conditions-and-diseases/glaucoma. [Accessed 10 December 2020]
10. Moroi SE. et al. Precision Medicine to Prevent Glaucoma-related Blindness. Curr Opin Ophthalmol. 2019; 30(3):187-198.
11. Thygesen J. Glaucoma therapy: preservative-free for all? Clin Ophthalmol. 2018 Apr 13; 12:707-717.
12. Gazzard G. et al. Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiGHT): a multicentre randomised controlled trial. The Lancet. 2019; 393:1505-16.
13. Lavia C. et al. Minimally-invasive glaucoma surgeries (MIGS) for open angle glaucoma: A systematic review and meta-analysis. PLoS ONE. 2017; 12(8): e0183142
14. Dada T. et al. Mindfulness Meditation Reduces Intraocular Pressure, Lowers Stress Biomarkers and Modulates Gene Expression in Glaucoma: A Randomized Controlled Trial. J Glaucoma. 2018; 27(12):1061-1067.
15. Haymes SA. et al. Risk of falls and motor vehicle collisions in glaucoma. Invest Ophthalmol Vis Sci. 2007; 48(3):1149-55.
16. Bright Focus Foundation. 2020. Glaucoma: Home & Personal Safety. [ONLINE] Available at: https://www.brightfocus.org/ glaucoma/home-safety. [Accessed 20 January 2021]
17. Lajoie K. et al. Glaucoma-Related Differences in Gaze Behavior When Negotiating Obstacles. Transl Vis Sci Technol. 2018; 7(4):10.
18. Bambo MP. et al. Evaluation of Contrast Sensitivity, Chromatic Vision, and Reading Ability in Patients with Primary Open Angle Glaucoma. Journal of Ophthalmology. 2016; 2016:1-6.
19. Burton R. et al. Glaucoma and reading: exploring the effects of contrast lowering of text. Optom Vis Sci. 2012; 89(9):1282-7.
20. Enoch J. et al. How do different lighting conditions affect the vision and quality of life of people with glaucoma? A systematic review. Eye. 2019; 34(1):138-154.
21. Risner D. et al. Effects of Exercise on Intraocular Pressure and Ocular Blood Flow. J Glaucoma. 2009; 18:429–36.
22. Zhu MM. et al. Physical exercise and glaucoma: a review on the roles of physical exercise on intraocular pressure control, ocular blood flow regulation, neuroprotection and glaucoma-related mental health. Acta Ophthalmol. 2018; 96(6): e676-e691.
23. Wylegała A. The Effects of Physical Exercises on Ocular Physiology: A Review. J Glaucoma. 2016; 25(10):e843-e849.
24. Goenadi CJ. et al. The Effect of a Diving Mask on Intraocular Pressure in a Healthy Population. Case Rep Ophthalmol. 2016; 7(2):328-32.
25. McMonnies C. et al. Intraocular pressure and glaucoma: Is physical exercise beneficial or a risk? Journal of Optometry. 2016; 9:139-47.
26. Coleman AL. et al. Glaucoma Risk and the Consumption of Fruits and Vegetables among Older Women in the Study of Osteoporotic Fractures. Am J Ophthalmol. 2008; 145:1081–1089.
27. Dang H. et al.The Impact of Obesity and Lifestyle-related Risk Indicators in Open-Angle Glaucoma: A Review. Univ Toronto Med J. 2014; 91(1):36-9.
28. Cheung N. et al. Obesity and eye diseases. Surg Ophthalmol. 2007; 52(2):180-95.
29. Ramdas WD. et al. The Effect of Vitamins on Glaucoma: A Systematic Review and Meta-Analysis. Nutrients. 2018; 10(3): E359.
30. Pasquale LR. et al. The Relationship between caffeine and coffee consumption and exfoliation glaucoma or glaucoma suspect: a prospective study in two cohorts. Invest Ophthalmol Vis Sci. 2012; 53(10):6427-33
31. Bussel I. et al. Dietary factors and the risk of glaucoma: a review. Ther Adv Chronic Dis. 2014; 5(4):188–94.
32. Chandrasekaran S. et al. Effects of Caffeine on Intraocular Pressure. J Glaucoma. 2005; 14:504–7.
33. Crossland MD. et al. Smartphone, tablet computer and e-reader use by people with vision impairment. Ophthalmic Physiol Opt. 2014; 34(5):552-7.
34. Qudsiya S. et al. Study of intraocular pressure among individuals working on computer screens for long hours. Ann Med Physiol. 2017; 1(1): 22-5.
35. Yoshida M. et al. Association of smoking with intraocular pressure in middle-aged and older Japanese residents. Environ Health Prev Med. 2014; 19:100–7.
36. Anton-Lopez A. et al. Lifestyles guide and glaucoma (II). Diet, supplements, drugs, sleep, pregnancy, and systemic hypertension. Arch Soc Esp Oftalmol. 2018; 93(2):76-86.
37. Chung H. et al. The Association between Primary Open-Angle Glaucoma and Blood Pressure: Two Aspects of Hypertension and Hypotension. Biomed Rest Int. 2015; 2015:827516.
38. De Moraes CG. et al. New Recommendations for the Treatment of Systemic Hypertension and their Potential Implications for Glaucoma Management. J Glaucoma. 2018; 27(7):567-571.
39. Glaucoma Facts and Stats. 2020. Glaucoma Facts and Stats. [ONLINE] Available at: https://www.glaucoma. org/ glaucoma/glaucoma-facts-and-stats.php. [Accessed 10 December 2020].

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ECOS-G gathers more than 100 ophthalmologists in glaucoma and ocular surface. The aim of the club is to provide clinical education with the latest scientific evidence to ophthalmologists and to answer unmet needs on OSD management in glaucoma patients.

Leading glaucoma specialists have contributed to the information within this leaflet.

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Théa
let's open our eyes

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