RNIB

See differently

Understanding

Glaucoma

The ROYAL COLLEGE of OPHTHALMOLOGISTS

Contact us

We're here to answer any questions you have about your eye condition or treatment. If you need further information about glaucoma or on coping with changes in your vision, then our Helpline is there for you.

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RNIB's Understanding series

The Understanding series is designed to help you, your friends and family understand a little bit more about your eye condition.

The series covers a range of eye conditions, and is available in audio, print and braille formats.

Contents

What is glaucoma?

Glaucoma is an eye condition where your optic nerve is damaged by the pressure of the fluid inside your eye.

This may be because your eye pressure is higher than normal, or because of a weakness to your optic nerve.

What parts of the eye does glaucoma affect?

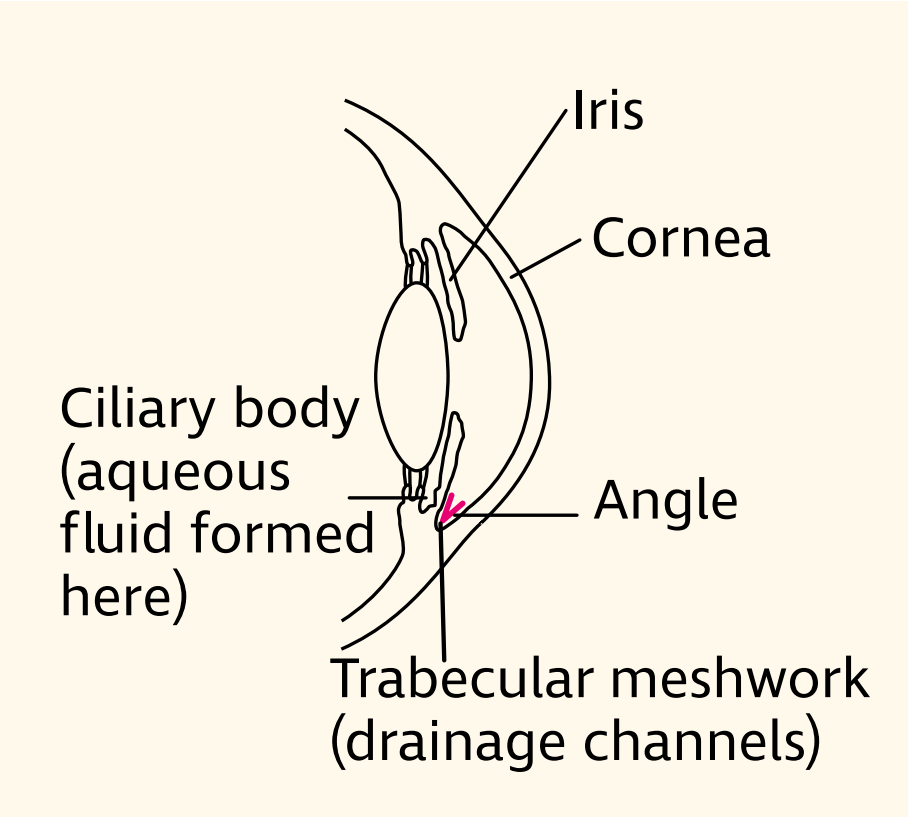
The anterior chamber of your eye (the inside of the front of your eye) is filled with a watery fluid called the aqueous humour. This fluid creates a pressure in your eye, which keeps it healthy and in the right shape. Your eye pressure is known as your intraocular pressure (IOP) and it isn't connected to your blood pressure in any way. The aqueous fluid, which is inside your eye, is different from your tears.

Aqueous fluid is produced in a ring of tissue, called the ciliary body, behind the coloured part of your eye, the iris. It flows through the pupil and drains away through a spongy network of holes called the trabecular meshwork. This sits in the angle where your iris and cornea, the clear front surface of your eye, meet.

Usually, aqueous fluid drains away at the same rate as it's produced to keep your eye at the correct pressure. The normal range of eye pressure is roughly around 10 to 21mmHg (mmHg stands for millimetres of mercury and is the measurement used for eye pressure).

If the fluid cannot leave your eye as quickly as it's produced, your eye pressure will build up. This pressure can cause damage to your optic nerve at the point where it leaves the back of your eye. This damage is called glaucoma.

Your optic nerve is important for sight because it's the pathway for the signals from your retina, the light sensitive cells at the back of your eye, to your brain. This pathway allows you to "see" the world around you.



What are the types of glaucoma?

The main types of glaucoma are:

- **Primary open angle glaucoma** where damage to the optic nerve occurs slowly over a long period of time due to your eye pressure increasing to more than 21mmHg.
- **Closed angle glaucoma** where damage to the optic nerve can happen very quickly due to a sudden rise in eye pressure.
- **Normal tension glaucoma** when an eye pressure of less than 21mmHg still causes damage to the optic nerve.
- **Secondary glaucoma** which occurs as a result of another eye condition, an injury to the eye or due to medication.
- **Congenital glaucoma**, when a baby is born with glaucoma.

Who is at risk of getting glaucoma?

Anyone can develop glaucoma but some factors can put you at more risk. These include:

- **Your age:** Glaucoma is more common as you get older. It occurs in two per cent of people over the age of 40, increasing to almost 10 per cent of people over the age of 75.
- **Your family history:** You're at a higher risk of developing glaucoma if you have a close blood relative (a parent, brother, sister or child) with glaucoma. If you've been diagnosed with glaucoma, let these close family members know. If they're over 40, they should see their optometrist (also known as an optician) every year, and they won't have to pay for their eye examinations.
- **Your race:** If you're from an African-Caribbean ethnic background, then you may be at a higher risk of developing open angle glaucoma. It's also more likely to develop earlier in life – before the age of 40, and there is a chance that it may develop more quickly. Being of East Asian origin can increase your risk for closed angle glaucoma.

- **Your eyesight prescription:** Being short-sighted can increase your risk of developing open angle glaucoma. Closed angle glaucoma is more common in people who are long-sighted.
- **Being diabetic** can increase your risk of developing glaucoma.
- If you have used **steroids** for a long period of time, you may develop glaucoma.

Primary open angle glaucoma

This is the most common type of glaucoma in the UK. It's also known as **chronic open angle glaucoma** which means the damage to your optic nerve and changes to your sight happen very slowly over time.

Will I have any symptoms?

You can't "feel" primary open angle glaucoma; it doesn't cause any symptoms and the eye pressure doesn't cause any pain. You may not notice any difference in your vision because glaucoma affects your peripheral vision (also known as your side vision) first. As your peripheral vision is not as sensitive as your central vision, it's difficult to notice any early changes to your vision – but your sight is being damaged.

Because you may not notice a problem until your glaucoma is more advanced, it's important to have regular eye tests as this is the only way to know if you have it. The earlier your glaucoma is picked up and treated, the more of your sight can be protected.

How can primary open angle glaucoma affect my sight?

If there is damage to your optic nerve, blind spots can begin to form in the outer edges of your vision. You may miss things in your peripheral vision.

Without treatment, sight loss can slowly progress so that your field of vision becomes very narrow and it can appear as if you're looking through a tunnel. Finally, if left untreated, your central vision may be affected too, causing blind spots to appear when you look straight ahead.

Unfortunately, once sight loss occurs, it can't be reversed as there are currently no treatments which can restore the damaged nerve. This means that it's really important that your glaucoma is picked up and treated early to prevent optic nerve damage in the first place and to avoid sight loss.

Primary open angle glaucoma usually affects both eyes, but one eye may be affected more than the other.

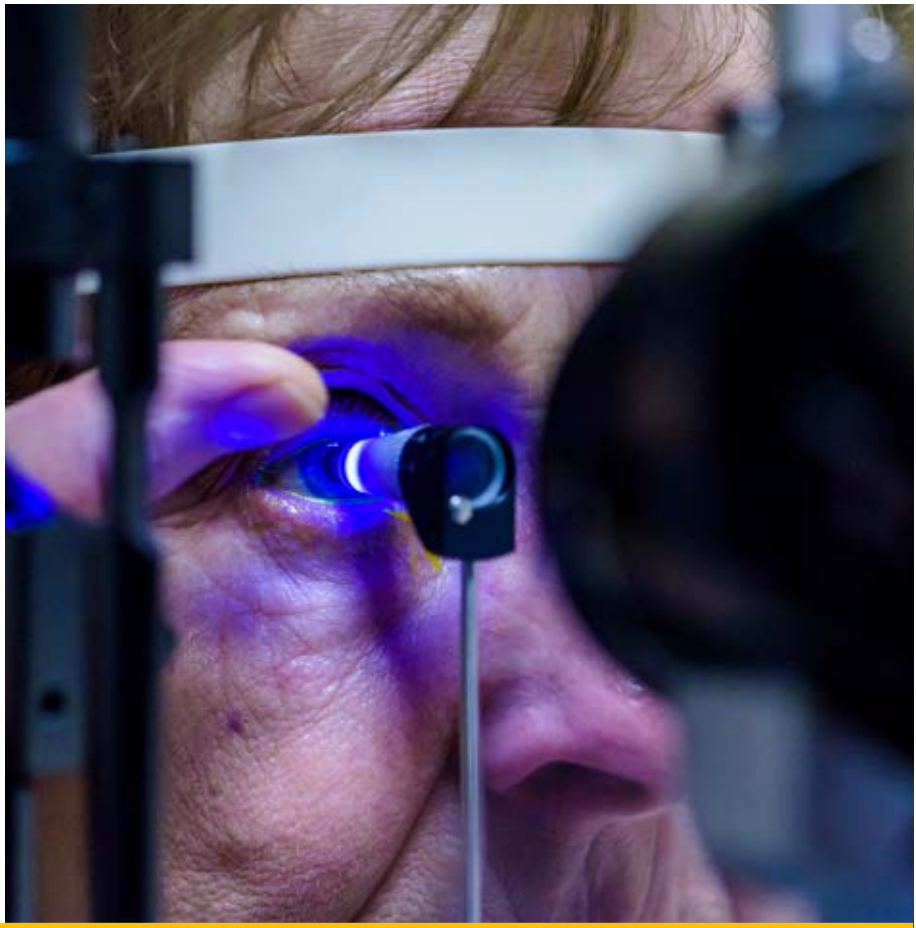
What are the tests for primary open angle glaucoma?

There are three main tests your optometrist will use to check for glaucoma:

- Looking at the health of your optic nerve at the back of your eye using a bright light to check for any changes. Some optometrists may also take a photograph of the optic nerve at the back of your eye.
- Measuring your eye pressure (tonometry). Most optometrists do this using the "puff of air" test, known as non-contact tonometry. Although this test may make you jump, it's not painful and doesn't harm your eye in any way. Some optometrists may measure your eye pressure in a slightly different way, using anaesthetic eye drops and a small instrument which gently touches your eye, known as contact tonometry.
- Measuring your field of vision. This is to check for any missing areas of vision or blind spots. During this test, you'll be asked to focus on the centre of a screen and press a button each time you see a small flash of light in your side vision.

It’s possible to have glaucoma even if you have normal eye pressure, so the results of all of these tests will be looked at together.

If your optometrist is concerned about the results of any of these tests, they may carry out further tests, or will refer you to another optometrist or an ophthalmologist (also known as a hospital eye doctor) for further tests.



Further tests the optometrist or ophthalmologist may want to do include:

- Measuring your eye pressure using contact tonometry. This is done by using anaesthetic and yellow eye drops, a blue light and an instrument which gently touches the front of your eye. The anaesthetic eye drops numb your eye beforehand so it's not painful. This method of measuring eye pressure tends to give a more accurate reading than the "puff of air" test.
- Measuring the thickness of your cornea, because this can help with the accuracy of your eye pressure readings.
- Examining the area, or angle, in your eye where the aqueous fluid drains out using a mirrored lens – a procedure called gonioscopy.
- Using OCT (ocular coherence tomography) to provide a detailed scan of the optic nerve. This can show up any damage to the cells of the optic nerve. OCT can also be used to examine the drainage angle of your eye.

What is the treatment for primary open angle glaucoma?

All treatment for glaucoma aims to lower your eye pressure to prevent damage to your optic nerve and your sight.

Damage to the optic nerve can occur at different eye pressures among different people. Even if your eye pressure is at a normal level to begin with, treatment will still be aimed at lowering this pressure to a level which is safe for you – your ophthalmologist may call this your "target eye pressure".

Eye drops

Treatment to lower your eye pressure usually starts with eye drops, and for most people with glaucoma, this is all the treatment they will ever need. But, these drops will need to be used long term or for life.

The eye drops work by either reducing the amount of aqueous fluid that your eye produces, or by helping the aqueous fluid drain away more quickly. There are different types of eye drops that can be prescribed for glaucoma. Your ophthalmologist will decide on the type of eye drops to prescribe, depending on your medical history. They will

monitor your eye pressure at regular check-ups to make sure the drops are working.

It may take time to find the right drop or combination of drops to control your eye pressure. If you've just started using eye drops, or if you have recently changed your type of eye drops, your eye pressure would normally be checked within a few months of starting the new drops to find out how well they're working.

Taking the drops will not cause any change in your sight, so it can be difficult to understand why you need to put them in every day. Your drops are preventing any future damage to your sight so it's very important to keep using them. If you don't use your drops then your eye pressure will remain too high and damage your optic nerve, which will cause you to lose your sight.

Laser treatment

If it's not possible to control your eye pressure with eye drops alone, your ophthalmologist may suggest laser treatment. Your ophthalmologist is the best person to advise you whether this is likely to work in your eyes.

The most common treatment is called a laser trabeculoplasty. The laser treatment is applied

to the trabecular meshwork, which helps it to work and drain fluid better, lowering your eye pressure.

Laser treatments are generally straightforward procedures usually done in the outpatient clinic under local anaesthetic, and most people recover very quickly.

Laser trabeculoplasty is very successful at helping to lower eye pressure in some patients, but you will normally still need to continue using eye drops after your treatment to keep your eye pressure stable.

Surgery

In a very small number of people with glaucoma, where eye drops haven't been successful in keeping the eye pressure stable, or where the glaucoma is advanced, surgery may be an option.

The most common surgery for glaucoma is called a trabeculectomy. This surgery creates a new permanent drainage channel in your eye for the aqueous fluid to drain away, lowering your eye pressure.

The new opening is made in the sclera (also known as the white of your eye). The aqueous fluid drains out through the opening and

forms a small reservoir, called a bleb, on the surface of your eye, which is hidden under your upper eyelid.

The fluid then gets reabsorbed back into your bloodstream. Anti-scarring medicine is used on the eye during the operation to prevent the opening from closing up.

You will normally be checked very frequently at the eye clinic in the weeks following your operation. During these visits, you may have further small procedures such as removing or adjusting stitches to fine-tune the eye pressure, or injections of anti-scarring medication.

After having a trabeculectomy, some people's eye pressures come down enough that eye drops may no longer be needed on the eye that has had the operation. Your ophthalmologist will be able to let you know if this is the case for you. You'll still be monitored regularly at the eye clinic whether you need continuing treatment or not.

There are other types of surgery for glaucoma, such as aqueous shunts or tube implants. Your ophthalmologist will be able to explain the different types of surgery with you and discuss what options are right for you.

Closed angle glaucoma

Acute closed angle glaucoma happens when your eye pressure rises very suddenly, which can cause damage to your optic nerve over a very short space of time. It happens when the outer edge of the iris is pushed forward by the aqueous fluid behind it. This causes the iris to come into contact with the cornea, closing the drainage angle. This stops the aqueous fluid from draining away altogether.

What are the symptoms of closed angle glaucoma?

In the early stages, some people may get a series of mild attacks. Your vision may seem misty, you may see rainbow-coloured rings around white lights, or your eyes may feel achy especially in the evenings. If you have any of these symptoms, it's important to have your eyes tested as soon as possible and let your optometrist know.

However, for most people, there's no warning. A sudden increase in eye pressure is very painful, your eye becomes red and your sight gets worse. You may even black out, feel nauseous or be sick. It usually affects only one eye at a time and it's rare for both eyes to have an attack at the same time.

Sometimes, during a routine eye test, your optometrist may notice your drainage angles are very narrow, which may be an early sign that you're at risk of closed angle glaucoma. Your optometrist may refer you to an ophthalmologist for further tests and treatment, even if you don't have any symptoms.

What is the treatment for closed angle glaucoma?

If you have an acute attack, you'll need to go to the hospital immediately to have treatment to lower your eye pressure quickly and prevent permanent sight loss. This treatment will be a combination of eye drops and a tablet or injection, which reduces your eye pressure quickly, and eases the pressure and pain. In most cases, if treatment is given quickly, your sight can recover almost completely.

Once your eye pressure is under control again, it's normal to need some further treatment to prevent you from having another acute attack. Usually, this is a laser treatment to make a small hole in your iris, a procedure known as a peripheral iridotomy.

The laser creates a channel for the aqueous to flow through, which prevents the iris being pushed forward and prevents the angle from closing. The treatment is normally carried out on both eyes to prevent the same problem occurring in either eye in the future. It's generally a straightforward procedure from which people recover quickly and the holes can't be noticed by other people.

A laser iridotomy may also be given to people whose drainage angles appear narrow during an eye test. This is to prevent them from having a possible closed angle attack in the first place.

What happens in the long term?

If an acute closed angle attack is treated quickly, it can usually be brought under control within a few hours. Your eye becomes more comfortable and your sight can recover almost completely.

Occasionally, following all the treatments, eye pressure can remain high. In these cases, you may need to use regular eye drops in the long term to keep your eye pressure controlled and prevent damage to your optic nerve.

Normal tension glaucoma

This type of glaucoma occurs when your eye pressure is within normal range, but causes damage to your optic nerve.

It's not entirely known why some people's optic nerve becomes damaged even though their eye pressure is at a normal level. It's thought that perhaps some people's optic nerve may just be weaker or have a more fragile blood supply, and unable to cope with an eye pressure within the normal range.

Normal tension glaucoma is treated in the same way as open angle glaucoma – by lowering your eye pressure to a level which is right for you, to keep your sight safe.

Secondary glaucoma

Secondary glaucoma is caused by the effect of another eye condition, an injury to the eye, or certain treatments, medications or operations.

Some causes of secondary glaucoma include:

- Pigment dispersion syndrome and pseudoexfoliation which is where pigment or flakes get deposited in the trabecular meshwork. This can increase eye pressure and lead to glaucoma.
- Uveitis (inflammation inside the eye) can lead to high eye pressure and glaucoma.
- Steroid medication can sometimes cause eye pressure to rise and lead to glaucoma.
- Abnormal blood vessel growth at the iris in conditions such as diabetic retinopathy or retinal vein occlusion can cause glaucoma, known as neovascular glaucoma.

The treatment for these types of glaucoma is again aimed at reducing the eye pressure as well as treating the underlying cause or eye condition.

Congenital glaucoma

Congenital glaucoma is a rare form where a baby is born with glaucoma because their drainage system didn't develop properly before birth.

Congenital glaucoma is usually treated early on in life, usually with surgery, and is managed by specialist clinics.

Ocular hypertension (high eye pressure)

Some people naturally have eye pressure above the normal range, but this pressure doesn't cause any damage to their optic nerve. This is described as ocular hypertension rather than glaucoma.

Different people can have different optic nerve strengths, and some people's optic nerves stay healthy at higher than normal eye pressures.

Most people's eye pressures are in the range of 10 to 21mmHg. If you have an eye test and your eye pressure is higher than 24 mmHg, your optometrist may refer you to the eye clinic for more tests. These tests will check whether this higher eye pressure is likely to cause any problems to your optic nerve.

An ophthalmologist may diagnose you with ocular hypertension. This means that the pressure in your eye is high but that it is not causing any damage to your optic nerve. A high pressure may be completely normal for your eye.

If you have ocular hypertension, it can increase your risk of developing glaucoma so this needs to be monitored. Sometimes you may be prescribed

eye drops to help reduce your eye pressure and reduce your risk of developing glaucoma. If this is the case, you'll be followed up at the eye clinic regularly to monitor your eye pressure.

You may be discharged from the eye clinic if you don't require eye drops and tests show that there is no sign of glaucoma. However, it's important for you to visit your optometrist regularly for your eyes to be checked so that any future changes can be picked up. Your optometrist or ophthalmologist will be able to tell you how often you should have your eyes checked.

Managing your glaucoma

Having glaucoma may mean you need to make a few changes to your everyday life in order to prevent sight loss. For most people, this includes using eye drops daily and having to attend regular eye clinic visits.

Most people with glaucoma use eye drops for many years or for life. Using your drops regularly helps to keep your eye pressure under control and prevents damage to your sight. Not using your drops could, in the long term, make your glaucoma unstable and lead to permanent sight loss. Unfortunately, once sight loss due to glaucoma has occurred, it is not reversible.

It's important to tell your ophthalmologist if your eye drops are causing you any problems. Like all medications, some drops do have side effects, such as eye irritation, and some aren't suitable for people with certain underlying health conditions. Usually only a small number of people experience side effects. The risk of side effects is very small compared to the risk of losing your sight if you don't use the drops.

If you're having a problem with a particular type of eye drop, it may be possible for your ophthalmologist to suggest an alternative drop. Preservative-free eye drops may be an option if you're sensitive to any of the preservatives added to the drops.

It's also very important to attend all your appointments at the eye clinic to make sure your eye pressure stays stable. This is because changes in eye pressure have no symptoms, and without regular checks you won't be able to tell that your treatment is working. It also gives you a good opportunity to ask your ophthalmologist any questions you may have about your glaucoma treatment. How often you need to be seen at the eye clinic will depend on how well your treatment is working.

You'll usually have a regular visual field test done at your eye clinic visits, which helps your ophthalmologist monitor how your glaucoma is affecting your sight. It's easy to lose concentration as the test can take 10 minutes per eye, but it's important to get an accurate result as it allows your ophthalmologist to make the right decisions about your treatment.

Can I still drive when I have glaucoma?

Many people with glaucoma are able to carry on driving, depending on how much of their peripheral vision has been affected. You are required by law to report a condition which may affect your sight to the Driver and Vehicle Licensing Authority (DVLA), including if you have glaucoma in both eyes, but not ocular hypertension.

The DVLA will need to assess your peripheral vision to see whether your sight meets their standards. The DVLA may also ask you to have these tests regularly to assess if it's safe for you to continue to drive.

Coping

It's completely natural to be upset when you've been diagnosed with glaucoma and it's normal to find yourself worrying about the future and how you will manage with a change in your vision.

It can sometimes be helpful to talk about these feelings with someone outside of your circle of friends or family. At RNIB, we can help with our telephone Helpline and our Sight Loss Counselling team. Your GP or social worker may also find a counsellor for you if you feel this might help.

Your eye clinic may also have a sight loss adviser (also known as an Eye Clinic Liaison Officer or ECLO), who can be on hand to provide you with further practical and emotional support about your eye condition.

Further help and support

If glaucoma is picked up and treated early, you may not experience much of a change to your vision. You can carry on with everyday activities such as reading, watching television and using the computer – these things will not make your glaucoma worse.

If you do have some sight loss, there are a lot of things you can do to make the most of your remaining vision. This may mean making things bigger, using brighter lighting or using colour to make things easier to see. We have a series of leaflets with helpful information on living with sight loss, including how to make the most of your sight. You can find out more about our range of titles by calling our Helpline.

You should ask your ophthalmologist, optometrist or GP about low vision aids and getting a low vision assessment. During this assessment with an optometrist, you'll be able to discuss the use of magnifiers and aids to help you to see things more clearly.

You should also ask your ophthalmologist whether you're eligible to register as sight impaired (partially sighted) or severely sight impaired (blind). Registration can act as your passport to expert help and sometimes to financial concessions. Even if you aren't registered, a lot of this support is still available to you.

Local social services should be able to give you information on staying safe in your home and getting out and about safely. They should also be able to offer you some practical mobility training to give you more confidence when you are out.

If you have questions about anything you've read in this publication, please get in touch with us.

Our Helpline is your direct line to the support, advice and services you need. Whether you want to know more about your eye condition, buy a product from our shop, join our library, find out about possible benefit entitlements, or be put in touch with a trained counsellor, we're only a call away.

It's also a way for you to join RNIB Connect, our community for anyone affected by sight loss. RNIB Connect is free to join and you'll have the chance to meet other people with similar experiences in our helpful, welcoming and supportive community.

Give us a call today to find out how we can help you.

RNIB Helpline
0303 123 9999
helpline@rnib.org.uk

We're ready to answer your call Monday to Friday 8am to 8pm and Saturday 9am to 1pm.

You can also get in touch by post or by visiting our website:

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SightLine (IGA's helpline): **01233 64 81 70**
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www.glaucoma-association.com

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We value your feedback

You can help us improve this publication by letting us know what you think about it. Please complete and return the form opposite to:

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3. Is there any information you would have found helpful, that was missing?

4. Do you have any other comments about this publication or any aspect of your contact with RNIB?

Information sources

RNIB and The Royal College of Ophthalmologists do all we can to ensure that the information we supply is accurate, up to date and in line with the latest research and expertise.

This publication uses information from:

- The Royal College of Ophthalmologists' guidelines for treatment
- clinical research and studies obtained through literature reviews
- specific support groups for individual conditions
- medical text books
- RNIB publications and research.

For a full list of references and information sources used in the compilation of this publication, email **eyehealth@rnib.org.uk**.

About The Royal College of Ophthalmologists

The Royal College of Ophthalmologists champions excellence in the practice of ophthalmology and is the only professional membership body for medically qualified ophthalmologists.

The College is unable to offer direct advice to patients. If you're concerned about the health of your eyes, you should seek medical advice from your GP or ophthalmologist.

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RNIB

If you or someone you know is living with sight loss, we're here to help.

RNIB Helpline
0303 123 9999
helpline@rnib.org.uk

The Sight Advice FAQ answers questions about living with sight loss, eye health or being newly diagnosed with a sight condition. It is produced by RNIB in partnership with a number of other sight loss organisations. **sightadvicefaq.org.uk**

This leaflet has been produced jointly by RNIB and The Royal College of Ophthalmologists.

Printing of this booklet was supported by a grant from Novartis Pharmaceuticals UK Ltd, who had no influence on the content.

Produced date February 2019
Review date February 2022

PR10003
ISBN 978-1-85878-730-5
Ed 2

The Information Standard
Certified member

SE180804

Appendix 1D

Real patients coming to real harm

Ophthalmology services in Wales

Dr Tammy Boyce

RNIB Cymru

Supporting people with sight loss

Acknowledgements

I would like to express my gratitude to the clinical staff from health boards in Wales who were willing to share their experiences and insights into some of the capacity issues in the hospital eye service and the impact that this has on patients' sight.

Our thanks also go to Dr Tammy Boyce, the Royal College of Ophthalmologists, Alex McMillan, Sian Biddyr, Elin Wyn and Andy Williams at RNIB Cymru for their input and support with producing this report.

Ceri Jackson
Director, RNIB Cymru

Cover photo: Andrew Bassett/Shutterstock.com

Contents

Why RNIB Cymru commissioned this report

It's a shocking reality that every day in Wales people are going blind unnecessarily because of capacity problems in eye clinics. Every week at RNIB Cymru we hear of patients experiencing significant delays for sight saving treatments and follow up appointments. Clinicians tell us that the system is breaking down and is unable to cope. This report by Dr Tammy Boyce highlights the impact of this and confirms that people are going blind in Wales due to cancelled or delayed appointments.

Staff have described the situation as "chaotic" and "outright dangerous" with patients waiting sometimes for years for a follow up appointment or even disappearing from the system altogether. Even when clinical staff offer suggestions for improvement they are often ignored. This frustration causes low morale with one consultant describing the situation as "crisis management on a daily basis".

It is clear that there is a serious lack of capacity within the health boards to meet the increasing demand for ophthalmology services. We have an ageing population in Wales and the number of people with sight loss is predicted to double by 2050. This is compounded by an increase in some of the underlying causes of sight loss, such as diabetes and obesity. As well as planning for increased demand in the future the issues facing people today need to be addressed.

It is of grave concern that many health boards could not tell us how many patients are waiting to be seen. The bureaucratic systems that are in place mean that patients disappear into a black hole. RNIB Cymru wants to see new systems put in place to ensure eye clinics have the appropriate information to prioritise appointments in line with clinical need and not waiting time targets. It's also of vital importance that patients are informed of the risks to their sight if their appointments are delayed or cancelled.

Another alarming finding in this report is the inconsistent approach to recording the incidence of patients losing their sight while waiting for an appointment. It is totally unacceptable that one health board medical director suggests that recording these on patient safety incident forms was "unhelpful". This lack of data from health boards means that the report estimate of 48 people in Wales going blind because they are waiting too long for an appointment is a very conservative estimate.

RNIB Cymru is calling on the Welsh Government and health boards to take immediate steps to clear the backlog of patients waiting to be seen by ophthalmology services. In the longer term, a strategic plan needs to be implemented to ascertain and address the increasing capacity issues within ophthalmology services.

Nobody should lose their sight from a treatable eye condition simply because their eye clinic is too busy to provide care within a clinically appropriate timescale

Foreword

The Royal College of Ophthalmologists acknowledges the issues highlighted in this report, and that these recurring themes are not unique to Wales alone but are prevalent across the UK.

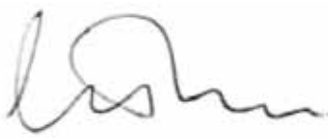
A substantial part of the workload of ophthalmology services is the care of long term conditions such as glaucoma, diabetic retinopathy and age-related macular degeneration. These conditions all become increasingly common with advancing age and all require timely recognition and treatment in order to avoid preventable sight loss. Unfortunately, clinical services for these long term conditions seem to be particularly vulnerable and pressurised resulting in increased and repeated postponement of follow up appointments. Many hospitals have been artificially forced to have fixed new to review ratios such as 1:3 and are not paid beyond that. These arbitrary ratios are clearly incorrect for patients with chronic eye conditions who need regular lifelong follow up.

It is the view of the Royal College of Ophthalmologists that those responsible for commissioning and providing eye health services need to work together effectively to protect the eye health of the populations they serve. This is not to suggest that these problems are easy to solve, far from it. But we suggest that the first step towards solutions needs to be systematic ascertainment of eye health needs across health boards or clinical commissioning groups, followed by systematic capacity planning. In addition, we would go so far as to recommend that follow up patients are protected with a waiting time “target” just as new patients are and therefore provides them with equal priority.

For some aspects of ophthalmology, such as primary and emergency care, health need is inherently difficult to predict and the capacity of services is usually based on historical demand. However, this is not the case for the long term eye conditions, where incidence and prevalence are relatively stable and can be extrapolated to local populations from national statistics with a fair degree of accuracy.

To take glaucoma as a particular example, it is possible to predict with reasonable accuracy how many new appointments, follow up examinations, visual field tests and prescriptions for medication are likely to be required per annum at a health board level to ensure that all patients are seen by the right eye health care professional in the right location and at the clinically appropriate frequency. This process of capacity planning can then inform discussions about workforce planning and skill-mix.

Whilst not based on a robust study, the findings in the report highlight the pressing need for joint work to protect the eye health of the population and prevent avoidable sight loss.



Professor Caroline MacEwen
President, The Royal College of Ophthalmologists

The Royal College of Ophthalmologists

1. Introduction

We can save sight but the ability to do so is increasingly compromised. We have the tools and the staff but not the system. What's going wrong?

In Wales, patients are going blind whilst waiting on lists. We conservatively estimate each year in Wales that 48 patients are losing their sight due to the length of time spent waiting to be seen in ophthalmology departments. This is because of a mismatch between demand and capacity – the number of ophthalmology patients is growing however the capacity to treat them is not.

Photo: Ingram/Thinkstock.com

Waiting lists are getting longer and the problem is worsening

Many patients are waiting longer than they should for review and follow up appointments – for example if ophthalmologists want to see the patient in three months, many patients are waiting six or more months. The length of time patients are waiting for their first appointments is increasing as well as the total number of patients waiting.

Patients that are waiting to be seen acutely (for example those with wet age-related macular degeneration (wet AMD)) are also waiting for too long.

Current waiting lists do not accurately reflect the true wait

Follow up patients, the majority seen in ophthalmology, are not accurately counted. We don't know the full scope of the problem. In addition to patients irreversibly losing their sight, there are numerous direct and indirect effects of the long waits:

- increasing costs – due to falls, return visits to primary care
- increasing health inequalities
- reducing staff morale – clinics are overbooked, relationships with management are poor.

Reducing waiting lists must start now or the lists will get longer

- Develop and fund short and long term plans and targets set to reduce waiting lists.

Change referral to treatment (RTT) targets to emphasise follow up patients

- Collect relevant and accurate data to outline real demand. This may require modifying current IT systems and funding additional staff and equipment or infrastructures.

2. Methodology

The information in the report is based on findings from interviews and an RNIB Cymru survey.

In April 2014, 15 people in Wales were interviewed to gauge opinion on capacity in hospital eye clinics, this included: ten ophthalmologists, one nurse and two managers from six health boards. Two optometrists were also interviewed to supplement the information.

Some words have been added to the quotes in order to improve understanding, as they were taken from live interviews. However, the meanings have not been altered.

Eight interviewees were identified when they completed the RNIB Cymru survey in December 2013 and agreed to be interviewed for this research. The remaining seven interviewees were recommended by those interviewed (ie snowballing technique). The 2013 RNIB Cymru survey received answers from 11 ophthalmologists and four nurses. Respondents repeatedly stated all Welsh ophthalmology departments faced similarly dire capacity problems.

The aim of this report was to understand more about the capacity problems in secondary care in Welsh ophthalmology departments. The interviews with clinical staff utilised qualitative methods and generated rich data enabling this research to identify capacity problems in secondary care in Welsh ophthalmology departments. Representatives from six health boards were interviewed in order to provide an understanding of which issues were prevalent across the country. In the semi-structured interviews, interviewees were asked whether departments had capacity problems; to describe these problems, how they affected patients, how these problems arose, and possible solutions.

The World Health Organisation states “there are no rules for sample size in qualitative research” **[1]**.

Of the 60 consultant ophthalmologists in Wales, ten were interviewed for this report, which equates to one-sixth of the workforce. Seven of the ten ophthalmologists interviewed were either previous or current heads of their departments. In addition to interviewing ophthalmologists, interviews were carried out with a small number of related staff that included optometrists, nurses and managers.

Data was analysed using a thematic analysis approach which allows meaning to emerge from the data **[2]**.

3. Findings

3.1 Patients are going blind

Patients in Wales are spending so long on waiting lists that they are unnecessarily losing their sight. Ophthalmology departments do not have the capacity to meet the demand.

All ten consultant ophthalmologists interviewed from six health boards stated patients are unnecessarily losing their sight whilst on the waiting lists. This confirmed findings from the RNIB Cymru survey in December 2013 survey where over two-thirds of respondents (nine out of 14, with one abstention) said patients were either "sometimes or often" losing sight due to delayed diagnosis caused by capacity problems, or losing sight due to delays in treatment and monitoring caused by capacity problems. This is supported by survey findings in England where 37 per cent of 170 ophthalmologists and nurses said patients are "sometimes" losing their sight unnecessarily due to delayed treatment and monitoring caused by capacity problems. A further four per cent of respondents said this is happening "often".

- "I think there's little doubt, in aggregate, patients are coming to harm... in individual cases it's hard to say if a patient would've got worse if he or she had been seen in a reasonable time scale. Were it not for that I think our Trust would've been sued to blazes, I think it's only a matter of time before it does... I think there will be a scandal about this if they don't do something." Ophthalmologist with over ten years' experience
- "Absolutely true...many could be losing their eyesight...we suddenly come across a patient who is progressing significantly whilst waiting for a clinic appointment." Ophthalmologist
- "Several consultants have done clinical governance incident issues saying 'we feel this patient has lost sight because of their delayed appointment' because when they should've, say, been examined in two months' time with possible need of more laser treatment, they haven't received that treatment." Nurse

There are inconsistencies in recording when patients are losing their sight whilst waiting. One health board in Wales completes patient safety incident forms as a result of patients permanently losing their sight whilst waiting to be seen. Another health board was discouraged from completing these

forms, their medical director advising it would be “unhelpful”. This confirms evidence from the Royal College of Ophthalmologists which found “under-reporting is widespread...only a minority of NHS incidents are reported.” [3]

Based on 2012 figures from the health board that does complete safety incident forms, we conservatively estimate each year in Wales that 48 patients come to “definite harm associated with delay in follow ups.” Based on their figure as a percentage of the Welsh population, we extrapolated to find that 48 patients are going blind each year due to the length of time spent waiting to be seen in ophthalmology departments.

Each year in Wales 48 patients are losing their sight due to long waits

3.2 Waiting lists are long and the problems are getting worse

- "People need to...be assured they will have rapid access to services and support when they need it." Mark Drakeford AM, Welsh Health Minister, September 2013

Despite the Health Minister's commitment and increased support and the work by the Welsh Government and the Delivery Support Unit – ophthalmology patients in Wales are experiencing long delays for both new and follow up appointments. The number of patients waiting for their first ophthalmology appointment is increasing as well as the length of time they are waiting for the appointment.

Since 2012, waiting times for ophthalmology appointments have increased, particularly the number waiting over 36 weeks for their first appointment.

More than 36 weeks	All Wales	ABM	AB	BC	Cardiff and Vale	Cwm Taf	Hywel Dda	Powys
January 2012	809	0	0	6	111	692	0	0
January 2013	1059	2	35	512	285	216	9	0
January 2014	2468	51	198	1180	548	239	252	0

Table 1. Patients waiting more than 36 weeks 2012–2014 (Welsh Government statistics)

Table 1 outlines the number of patients waiting more than 36 weeks for an ophthalmology appointment in January 2012, 2013 and 2014. Each health board in Wales was examined as well as the overall number of patients waiting in all of Wales. Overall in Wales the number of patients waiting more than 36 weeks for their first appointment has more than doubled between 2012 and 2014. In some health boards the increase is large – for example, Betsi Cadwaladr (BC) and Cardiff and Vale went from six in January 2012 to 1184 in January 2014. In some areas the increase is moderate (Aneurin Bevan (AB), Hywel Dda) and in the remaining areas there is no increase or a decrease (Abertawe Bro Morgannwg (ABM), Cwm Taf, Powys).

All interview and survey respondents agreed patients were not monitored or treated within clinically appropriate timescales.

Clinicians were more concerned that follow up appointments are frequently rescheduled or cancelled. Delays for these patients can lead to:

- "Real patients coming to real harm."
- "Patients suffering irreversible visual loss."

Interviews and surveys provided numerous examples of patients waiting longer than clinically advised – even for acute conditions like AMD. Ophthalmologists from two different health boards said the Royal College of Ophthalmology recommended timescale of a two week referral to treatment for wet AMD, is often not met:

- "We miserably fail to hit the two week referral. I don't think we do more than 20 per cent in that time. The usual wait is a month to six weeks." Ophthalmologist with over three years' experience
- "AMD patients are waiting six to eight weeks." Health care professional

Patients waiting under six weeks also waited longer than clinically advised:

- "We have a deficit of about 140 appointments every month for AMD alone...That's the size of people we should be absolutely seeing in four weeks but we are not able to. Instead of seeing in four weeks, we see an average of every six weeks." Ophthalmologist with over ten years' experience

If ophthalmologists wish to book a patient more than six weeks later, they find patients disappear into a "follow up not booked system" or a "black hole". This inability to book beyond six weeks (due to the Welsh Government's partial booking policy which encourages healthcare providers to make appointments no more than six weeks in advance, the minimum period consultants have to give to take leave) is perversely harming patients, even those with acute conditions.

- "Sheer lack of capacity and follow up 'not booked system', implemented in a way which is outright dangerous and certainly led to people coming to irretrievable harm." Ophthalmologist with over ten years' experience
- "Some patients asked to come back in three months may come back nine or twelve months later and this is particularly a problem

with diabetic retinopathy where post-treatment you need to decide if more treatment is required and if the patient doesn't pitch up for another nine months they can come to harm." Ophthalmologist with over ten years' experience

- "Say somebody comes in with suspected glaucoma. I see that patient today and we say they need to come back in six weeks' time and that never happens. And that patient completely disappears off the radar; they just go on the holding list. They don't have the capacity to reappoint the patient and he just disappears. That happens in every health board...the patients wait and wait and wait." Ophthalmologist with over ten years' experience

- "We have 2,000 patients on the holding list, patients who are attending once, waiting for further follow up appointments, who haven't been given an appointment as yet because there is no capacity. The majority are glaucoma and diabetic patients and they are potential sight threatening conditions. Because they are on a holding list, nobody knows what the numbers are or what type of patient they are until they attend." Ophthalmologist with over ten years' experience

In May 2013, Betsi Cadwaladr University Health Board acknowledged that over 7,000 patients' follow up appointment was more than 50 per cent overdue [4]. In interviews, consultants from different health boards also said ophthalmology patients in their areas were waiting years to be seen.

- "I've seen glaucoma patients who are two to three years off their sell by date." Ophthalmologist with over ten years' experience

- "Some patients on the holding list never get a chance to come into the system, they get pushed on and on. Some are waiting for two to three years - which is shocking." Ophthalmologist with over ten years' experience

Routine patients with conditions such as cataracts are "waiting and waiting and waiting" because ophthalmology departments only have the capacity to see urgent cases. Long waits on ophthalmology lists are becoming embedded in departments. One ophthalmologist examined their departmental waiting list and found 3.3 per cent of the entire Gwent population were due or overdue for follow up appointments in eye clinic. Long waits are also exacerbating health inequalities. In the old county of Gwent, Monmouthshire had high follow up rates compared to Blaenau Gwent and Torfaen with much lower follow up rates.

3.3 Waiting lists are inaccurate

Current waiting lists do not accurately reflect the true wait. Follow up patients, the majority seen in ophthalmology, are not accurately counted.

- "Follow up patients are never on the radar. They never come under the spotlight." Ophthalmologist with over ten years' experience

When asked if waiting lists were accurate for follow ups, all interviewees said they were either not at all accurate or not as accurate as lists for new patients.

- "Patients just disappear from the waiting list...mainly people with chronic conditions like glaucoma, diabetes...There was a patient last week who I saw in 2011 and wanted to see in three months. For reasons I don't understand – they turned up as a new patient." Ophthalmologist with over ten years' experience

- "We found one list where patients could easily get lost. We have a main consultant list and have other eye lists, things like laser clinic or emergency eye clinic and we found some patients on those lists who are well past follow up dates but how they get into consultant clinics is not clear." Ophthalmologist with over ten years' experience

A National Audit Office report in 2014 found England's official waiting statistics also do not capture the full waiting time experienced by patients from the time they are referred to treatment [5].

Because the waiting lists are so long, consultants are trying to circumvent the long waits but with little success.

- "If I see a patient I think ought to be seen in a year, I ask for an appointment in six months. If everybody does, it doesn't help; it conceals the problem and makes it more muddy and complicated." Ophthalmologist with over ten years' experience

Another way consultants seek to reduce the waiting lists, particularly for acute conditions, is to overbook clinics. This practice leads to long waits in ophthalmology departments on the day of the patient's appointment.

- "Overbooking is a big problem with us. Years ago you could say I've got so many slots left over in this clinic; we can fill them with new patients now. Unfortunately, because of targets and partial booking systems, all the slots are booked... urgent cases who are seen in clinic or casualty and need to come back within a week or two weeks' time, are squeezed in as extras." Health care professional

- **"Our clinics are about 50 per cent overbooked…if the patient needs to be seen in two weeks then I will see them."** Ophthalmologist with over ten years' experience

In light of the rising number of patient safety incidents, in 2009 the National Patient Safety Agency recommended departments:

- review levels of hospital-initiated cancellation of appointments rates for patients with established or suspected glaucoma
- identify the number of patients currently awaiting follow up and confirm that there is sufficient capacity within the local health community to meet this number in terms of outpatient appointments and any specialist investigations [6].

Despite these recommendations and the increasing number of patients waiting longer periods, neither of these recommendations were implemented. In 2013 RNIB Cymru sent Freedom of Information requests to each health board concerning glaucoma waits. The requests included the following questions:

- For each month of the last twelve months, how many patients with glaucoma or suspect glaucoma or ocular hypertension in your health board area were not seen within 26 weeks of referral?
- How many patients in your health board area with a diagnosis of glaucoma have not been seen within their due follow up?
- How many glaucoma patients had appointments cancelled or rearranged?

The main finding of this Freedom of Information request was that data on follow up waits is not known as it is not collected. Only Cwm Taf Health Board answered. Five health boards namely, Abertawe Bro Morgannwg University, Aneurin Bevan University, Betsi Cadwaladr University, Cardiff and Vale University, and Powys Teaching stated they do not collect the data.

If one health board is able to collect this data, it can be expected that all health boards are capable of doing the same. That this data is not collected also affects and worries ophthalmologists:

- **"The most dangerous thing is that there is no feedback to us. If I have a patient I want to see in three months and this is postponed, I'm not told, much less consulted."** Ophthalmologist with over ten years' experience

In some areas, booking clerks decide which patients are cancelled or delayed. Interviewees agreed:

- "Booking clerks do not necessarily know the risk in that, in terms of the importance of the patient being seen in six or twelve months. The consultants and clinicians don't make a decision about which patient is being pushed on." Health care professional

Follow up patients are never on the radar. They never come under the spotlight

3.4 The impact of long waiting lists for patients and the NHS

Ophthalmology departments are "heaving". In the survey, 14 out of the 15 respondents said there was either "not enough capacity to meet current demand" or "lack of capacity is a significant problem". Interviewees agreed clinics were "overwhelmed".

Waiting increases costs

Long waiting times damage patients' health and increase costs of care. "Waiting for treatment adds to health deterioration, increases financial costs to the NHS, and increases the burden on others, such as carers and general practices." [7] Deteriorating sight loss is associated with falls and waiting increases the risk of falling. In 2009, estimates of the total cost of falls related to partial sightedness and blindness in the direct health care system (not including long term institutional care) was £25.1million [8].

Patients are going back to primary care for another referral

Ophthalmologists from three health boards stated patients are going back to their GP for re-referral.

- "It has reached such a stage now that patients are going back to GPs and GPs are re-referring them as new patients. They have a better chance of getting into the system as a new patient." Ophthalmologist with over ten years' experience

Health inequalities are exacerbated

Ophthalmologists said those patients who complained were more likely to be pushed up lists. Many described the "types" of patients unlikely to complain:

- "You don't know about the ones who never are seen again. The ones we tend to recapture have the gumption to ring up and ask where's my appointment gone? I suspect older women... who trust that the system is working as it should, are the ones who are losing out." Ophthalmologist with over ten years' experience

Staff morale is low

- "Morale is hugely down. We get blamed for lack of performance. We've met with our medical director. Constructive suggestions are given but it never gets implemented. It's not the lack of solutions, it's implementation of ideas...That is the irony, a lot of money is spent. Money is thrown in a very unproductive way." Ophthalmologist with over ten years' experience

- “It is very chaotic; it’s always crisis management on a daily basis.” Ophthalmologist with over three years’ experience
- “A lot of people are completely dragged down by the system … some consultants are very good and others just have no interest at all, they’ve become inured to it all, they’re just dying for it all to go away.” Ophthalmologist with over ten years’ experience

3.5 Causes and solutions to capacity problems

> "We've been making do and mending for several years."
> Ophthalmologist with over ten years' experience

Interview and survey respondents named numerous causes of the capacity problems in ophthalmology departments.

3.5.1 Unalterable causes and suggested solutions

Increasing demand in services due to an ageing population

When the NHS was established in 1948 there were 200,000 people in the United Kingdom aged 85 or over. In 2014 this population has increased to 1.4 million and is expected to rise to almost three million by 2050 [9]. In addition, in Wales the population is older and consequently has increased health needs [10]. An ageing population places a greater demand on eyecare services as the prevalence of eye conditions increases significantly with age [11] [see Table 2].

Table 2 outlines the prevalence of the five most common sight threatening conditions in the UK and estimates their prevalence in 2010 and 2020. In all five conditions – wet AMD, dry AMD, glaucoma, early state diabetic retinopathy, diabetic maculopathy – the prevalence increases between 2010 and 2020.

Sight condition	UK prevalence 2010	UK prevalence 2020
Wet AMD	415,000	516,000
Dry AMD	194,000	240,000
Glaucoma	266,000	561,000
Early stage diabetic retinopathy	748,000	938,000
Diabetic maculopathy	188,000	236,000

Table 2. Prevalence of the common sight threatening conditions in the UK in 2010 and 2020 [12]

Increasing demand in services - more treatments available and developments in National Institute for Health and Care Excellence (NICE) guidance

All clinicians agreed that treatments and NICE guidance have increased the number of patients seen in ophthalmology departments. Whilst treatments for wet AMD reduced the number of people certified for visual impairment, ophthalmology departments were not allocated increased funding to administer these drugs nor for other new treatments or NICE guidance that increased their workloads.

- "The new NICE treatments have created huge capacity gaps and we do not have adequate staffing to meet the demands of the service." Ophthalmologist of over ten years' experience
- "NICE guidelines are fine, pharmacies get money back from the government, but I can't implement the whole thing because I don't have additional resources – that's how the NHS falls apart." Ophthalmologist with over ten years' experience

In the future, waiting lists are likely to increase as health boards are yet to offer a number of NICE approved treatments due to current capacity problems:

- "A lot of places do not provide to their local population things which are NICE approved...because of the capacity problems – doctors and space, staffing at all levels - nurse practitioners, orthoptists. (Interviewer: Have you asked for funding?) Yes, managers say they have no money." Ophthalmologist with over ten years' experience

Whilst the Welsh Government is unable to influence these two factors, there are other capacity related issues in Welsh ophthalmology departments that can be addressed.


3D OCT-2000
Patient ID 001
Menu
View
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3.5.2 Alterable causes and possible solutions

The policy emphasis on follow up patients

The current RTT targets emphasise the first contact or appointment yet the majority of ophthalmology outpatients are not new. Ophthalmology is outpatient based and patients tend to stay in systems. In 2011 and 2012, ophthalmology outpatient appointments accounted for 10.5 per cent of all outpatient appointments. The majority were follow up appointments – 244,965 versus 81,253 new appointments.

- "New patients are being seen to meet targets at the expense of follow up patients who have the risk of blinding disease, whereas the majority of new patients don't. Clinical priorities have been skewed and people with potential blinding disease in need of follow up for diabetes and glaucoma and possibly treated tumours and AMD, these patients are in the backlog rather than the clinic." Ophthalmologist with over ten years' experience

- "All conditions, irrespective of whether they are disabling or not... are painted with the same brush... a skin tag... given the same weight as glaucoma, not acute conditions..." Ophthalmologist with over ten years' experience

- "Last month some of my colleagues were breaching targets [13], cataract and squint patients were going to breach. I forfeited three of my theatre lists so that my colleague, who was struggling, could use my theatre sessions... but next month I was breaching. So it's just shuffling them about." Ophthalmologist with over three years' experience

In 2011, the Royal College of Ophthalmologists warned that the emphasis on seeing new patients is "deeply flawed" and warned that "the consequences of these actions in term of irreversible loss of sight, may take years to manifest." [14]

- "We've been arguing that there should be clinically oriented priorities rather than blindly following RTT. What hospital management is looking at is the pecking order. This patient is going to breach the RTT, we need to get them in." Ophthalmologist with over ten years' experience

Unless the Welsh Government changes the target, health boards will continue to chase the existing one – potentially leading to unnecessary irreversible sight loss. This is avoidable.

Shifting from short to longer term planning and targets

The emphasis on new patients has led to short term planning to meet the RTT targets with managers depending on solutions such as waiting list initiatives and delaying reappointing staff.

- "Robbing Peter to pay Paul. When vacancies come up they should be filled properly... if one nurse practitioner goes off you are left with a black hole." Health care professional

Collecting appropriate data to identify and address the actual capacity problems in ophthalmology departments.

Basic information is not collected to address actual demands – such as who is waiting (glaucoma or diabetes patients), how many cataract patients are waiting, how long are patients waiting or how many appointments are cancelled?

- "The biggest issue for us is lack of outpatient diagnostic data. We are not in a position to say, without looking at notes, if a patient has glaucoma/diabetic retinopathy. We can't plan." Ophthalmologist with over ten years' experience
- "How many patients have glaucoma? I honestly couldn't tell you from the information we get back from Myrddin or clinical work station – it's only by consultants physically going through every follow up patient can we get good information." Ophthalmologist with over ten years' experience

Managers and clinicians agree better evidence is needed to find the best solutions.

- "Rational decision making depends upon knowing how well services are performing. There are huge gaps in available data, and quite often the data that does emerge leaves clinical teams frustrated and suspicious. No one defends decision making in the dark, but this is precisely what follows." [15]

IT systems, like Myrddin, should be modified to collect information useful in reducing waiting lists.

- "It's not a good system... it's not sufficiently detailed to breakdown the patients' waiting - if you want to find who are the people who are really liable to come to harm." Health care professional

Investing in IT

Evidence is growing that virtual clinics increase the number of patients seen.

- "Every time I see a virtual patient in three minutes I'm freeing up 17 minutes of doctor time." Ophthalmologist with over ten years' experience

Scotland has funded improved IT links between hospitals and optometrists and reduced waiting lists. In 2011 the Scottish Government funded a £6.6million IT link so High Street optometrists would have a secure digital connection to eye clinics in hospitals - allowing them to transfer digital images instantaneously, removing the need for a referral pathway through GPs. This resulted in a considerable reduction in waiting times and freeing up secondary care [16].

Investing in IT will enable waiting lists to be properly validated. Departments in five health boards attempted to validate waiting lists. All validation exercises resulted in reduced waiting lists. Consultants in one hospital who validated their follow up lists estimate that about five to ten per cent of patients are at a particularly high risk of harm.

- "Many patients are still on the list who shouldn't be. We have gone through some of them and validating reduced 20-30 per cent of the original list. We are not validating now – because it requires time." Ophthalmologist with over ten years' experience
- "We have validated in an ad hoc way for some time. Since December/January 2014 I've been doing it systematically. I did it with 1200 patients who were delayed follow ups on my list and locum lists. Found about 20 per cent suitable for nurse led clinics, around 40 per cent patients didn't need to be followed up at all... it was skewed a bit because of a locum and he tended to bring people back that perhaps we wouldn't." Ophthalmologist with over ten years' experience

Annual or consistent validation of waiting lists is a potentially sustainable way to reduce waiting lists.

North Wales' efforts to reduce waiting lists

Consultants in North Wales sought to reduce lengthy waiting lists in two ways. These include:

a. Prioritising

The project had mixed results. Referral patients (from GPs and optometrists) were categorised as:

- P1 – conditions where a delay will produce irreversible harm to patient (for example glaucoma, diabetic macular oedema)
- P2 – reversible harm (for example cataracts)
- P3 – no harm produced as a result of deferred or delayed treatment apart from inconvenience (for example watery eye or skin tag).

Prioritisation was carried out in three areas initially but is now only done in Central areas because IT systems are unable to capture the necessary data in Wrexham and Bangor – where the pilot stopped in 2013. In the Central area, prioritising demonstrated a significant improvement. However, even in the Central area disadvantages arose. Clinically important patients were seen sooner but few of the cataracts were seen (as they come under P2) and some P3 patients were never seen.

b. Optometrists

Optometrists reviewed notes to identify "long waiters" – patients waiting more than 50 per cent over the follow up date (for example patient waiting to be seen in six months now waiting over nine months). Again, this effort to reduce the waiting list had mixed results. In Bangor a selection of patients were analysed and all children, and patients with glaucoma or diabetic retinopathy were removed.

In Wrexham a random sample of patients were analysed. The success of this project requires better analysis. There is no doubt that the number of patients on waiting lists reduced but interviewees claimed a reduction of between five to 60 per cent - depending on the method used. Efforts to reduce lists, such as this, are not analysed or publicised and this greatly misses an opportunity to efficiently reduce waiting lists across Wales. It is efficient and more sustainable for the Welsh Government and health boards to share information about their own efforts to reduce waiting lists.

Waiting lists will not decrease without more staff

Despite the increase in treatments, numbers of staff in ophthalmology departments are decreasing. For years the number of ophthalmic staff increased but these numbers are now moving in the opposite direction.

At 31 December 2013, there were 781 ophthalmic practitioners on health board lists, a decrease of 28 (3.5 per cent) on the previous year and an increase of 152 (24.2 per cent) since 2003. 773 (99 per cent) were optometrists (a decrease of 22 from 2012) and eight (one per cent) were ophthalmic medical practitioners (OMPs). Since 2003 the number of optometrists have increased by 179 (30.1 per cent) and OMPs have fallen by 27 (77.1 per cent) **[17]**.

In North Wales consultants at Wrexham Maelor hospital see over twice the number of new patients as the other two hospitals [Table 3]. Whilst the shortfall in staff has been highlighted to the Welsh Government, Wales Audit Office and the Royal College of Ophthalmologists, the department has been told repeatedly "there's no money for additional consultants".

Table 3 outlines the number of new patients seen by consultants in North Wales. It shows that consultants at Wrexham Maelor hospital see many more new patients compared to the other two hospitals in North Wales, suggesting a shortage in staff at Wrexham.

Area	Number of patients
Wrexham	2,024
Central	1,007
Bangor	908

Table 3. New patients seen by consultant – North Wales

Staffing solutions do not mean hiring more doctors, but it does mean spending some money.

- "The main areas where the demand is much greater than capacity is glaucoma and medical retina...We'd like to set up nurse led glaucoma clinics, virtual clinics. We could use up to four more nurse practitioners (Interviewer: Have you asked for funding?) Oh yes, they say they haven't got any money." Ophthalmologist with over ten years' experience

- “If you want to save money by using a band five person to see a glaucoma or AMD patient rather than a consultant to see them, you have to spend a little bit of money upgrading that person. In the long run you do save money but health boards haven’t got any money at all. To innovate they have to spend.” Ophthalmologist with over ten years’ experience

Some consultant ophthalmologists “need to learn to trust their colleagues in allied professions” (RNIB Cymru 2013 survey findings) but many stated they understood that clinical nurse specialists, orthoptists and technicians have an increasing role in reducing waiting lists.

- “I don’t care who does the work... the majority of the consultant body in ophthalmology is aware that the only way we’re going to get this work done is by all hands to the pump, the appropriate hands and, if you want to look at it from a manager’s point of view, the cheapest hands that can do any particular part of the job.” Ophthalmologist with over ten years’ experience
- “We need to replicate the glaucoma nurse practitioner system for the AMD clinics and increase the hours of these sorts of people... because nurse practitioners are very good in these roles but they don’t grow on trees.” Ophthalmologist with over ten years’ experience

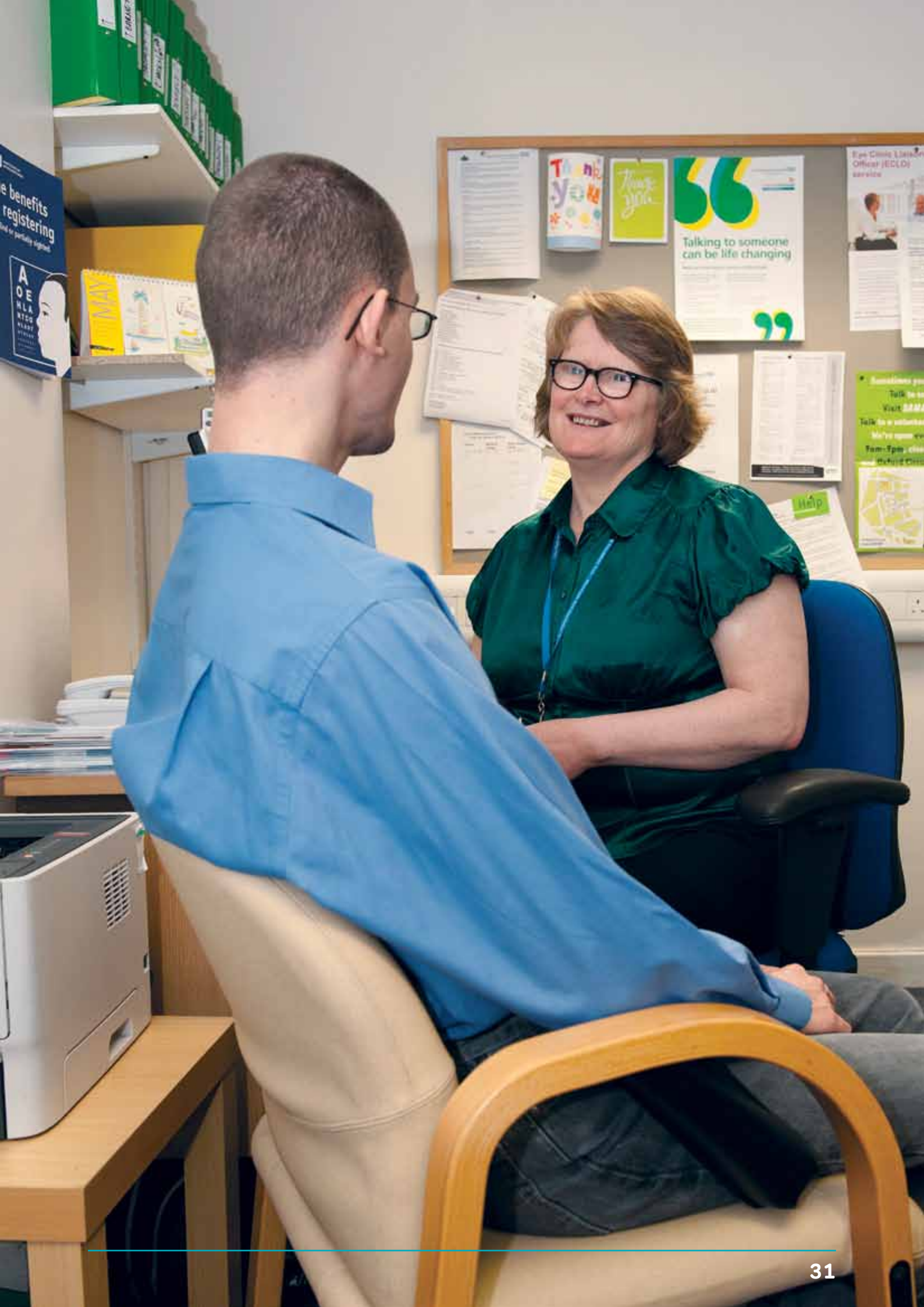
Addressing problems related to department infrastructure. If staffing issues are addressed, infrastructures will also need to be considered in order to meet actual capacity. Consultants from five health boards identified a number of related issues and solutions:

- “We have eleven consultants in a department designed for four. We have a new hospital... have expanded our footprint but we’re still really at limit of our space in service like Lucentis or wet AMD treatment.” Ophthalmologist with over ten years’ experience
- “We have a bay for eye patients and if there is a big winter pressure, lots of patients with flu, they take over our eye bay and eye lists get cancelled. Last year we lost about six to eight weeks in two months... 60-70 appointments a week.” Ophthalmologist with over ten years’ experience

- "We've made it clear that there is availability during the week... We're not using our time as efficiently as we could during the week. There's also staffing levels to consider, if I'm free and theatre's free that's great, but it doesn't work that way. I need nurses and others." Ophthalmologist with over ten years' experience
- "We need seats in the waiting area." RNIB Cymru survey findings
- "We keep telling them they are wasting money on waiting list initiatives. It's not a sustainable solution... our Monday to Friday capacity is not fully utilised because of various reasons and come to the weekend, they throw a whole load of money to see these patients again on Saturday and Sunday and it's absolutely barmy! It's scandalous, it's tax payers money... we've said our space utilisation is poor, we've showed them the figures and why it is happening... we've said we're not doing any weekend work until we get a sustainable solution." Ophthalmologist with over three years' experience

One way to fund improvements to departments is to use the Lucentis funding in ophthalmology departments instead of redirecting it out of the department. Ophthalmology departments receive £1,350 per assessment for patients receiving Lucentis wet AMD injection treatments and £65 per visit for assessments without injections. Ophthalmology departments should benefit from their own work.

- "They've diverted all of the millions of pounds of Welsh Government subsidy for other purposes. It's been difficult to get the infrastructure for the Lucentis work. They've refused to spend any of it on equipment or anything like. Welsh Government bought us an OCT (Optical Coherence Tomography) machine even though getting subsidies per patient." Ophthalmologist of over three years' experience
- "My health board has been embezzling the Welsh Government subsidy and spending it on other things." Ophthalmologist with over ten years' experience


Talking to someone can be life changing
Thank you
Help

4. Moving forward

The Welsh Government needs to fulfil its commitment to:

- revise targets for ophthalmology to incorporate measures for all patients (new and follow up) that are based on clinical need and risk of irreversible sight loss
- work with health boards to develop systems to improve routine data collection for demand, capacity, activity and backlog.

In order to meet these commitments the Welsh Government should:

- understand and plan to match demand against actual capacity
- create targets longer than one year:
  - to reduce likelihood of perverse incentives that cause departments to chase targets rather than address under-lying problems
- public reporting to be service and condition specific
- invest in IT, it is a solution – not an afterthought or the first budget cut:
  - virtual clinics save clinician time and increase the number of patients seen
  - roll out the Open Eyes electronic patient records system across Wales. With Open Eyes clinicians are able to access all the information they need about their patient in one place.

Together we can reduce waiting lists

In 2014 the Welsh Government can also:

- improve patient communication. Patients have a right to expect timely and good information on the length of waits – particularly what to do if appointments go beyond the time requested by clinicians

> "The real mischief of the system is it is completely opaque to patients and to us. If you are trying to find out when you are going to be seen, you can't." Ophthalmologist of over ten year's experience

- address staffing capacity issues – see the whole ophthalmology team as the solution
  - in Scotland the use of optometry and effective triaging in primary care reduced hospital referrals by 25 per cent
  - solutions are not just staffing costs – nurse practitioners require adequate space to see patients
- fully implement all eyecare pathways across Wales
- better understand and share results of efforts to reduce waiting lists
- commit to increased funding:
  - prevention is not cheap or free. The Welsh Government should plan and fund both prevention and treatment. Waiting lists will not decrease without investment. Ophthalmology departments are working at full capacity. You cannot expect more.

In 2015–2020 the Welsh Government can:

- plan targets for follow up and new patients
- reduce waiting lists
- create IT systems adequately analysing capacity problems, able to identify waiting list issues
- address staffing and spacing issues in ophthalmology departments to reduce waiting lists.

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I think there will be a scandal about this if they don't do something

Ophthalmologist with over ten years' experience

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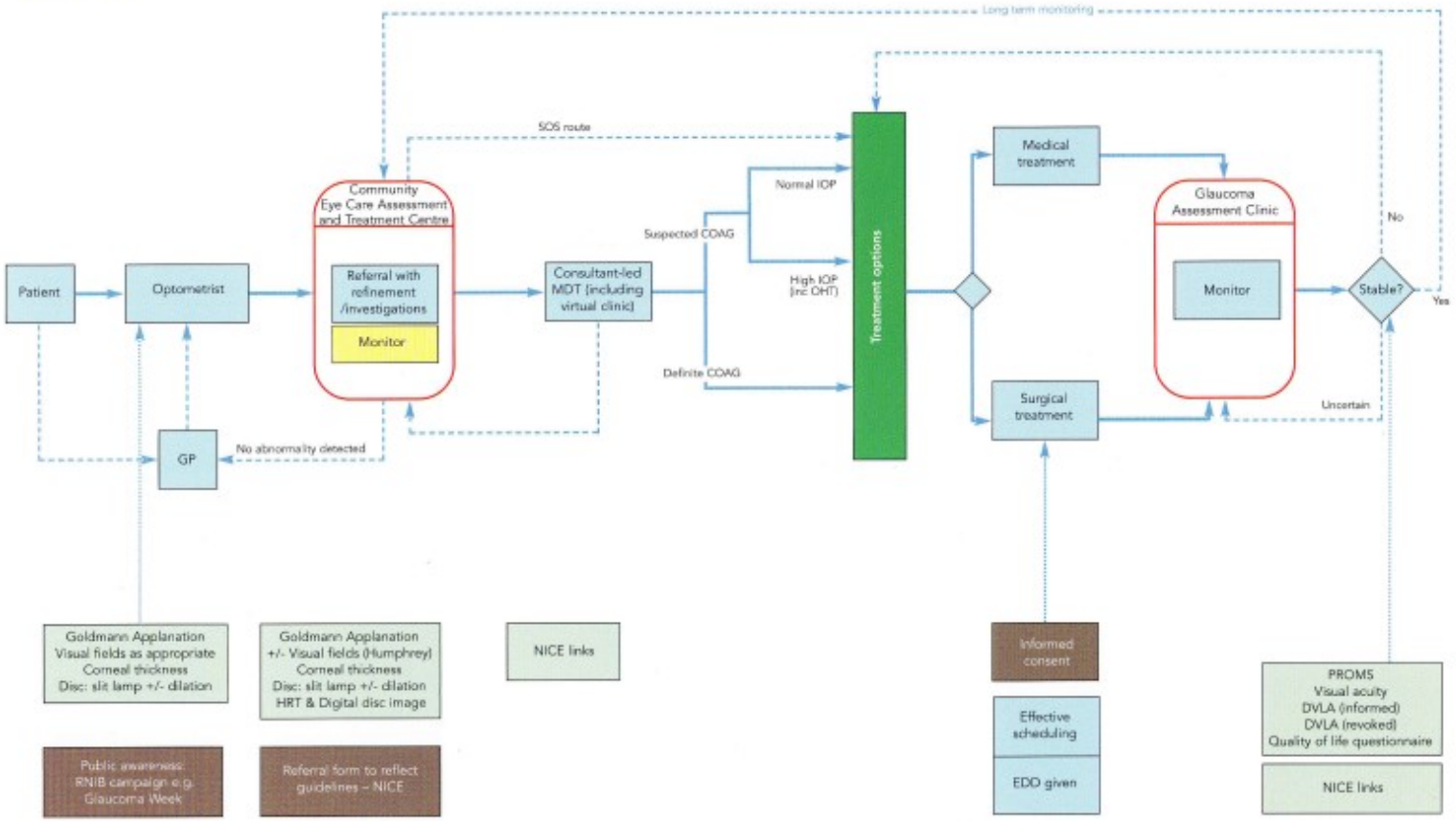
GIG CYMRU NHS WALES

Glaucoma Pathway

DELIVERY AND SUPPORT UNIT
UNED CYFLENWI A CHYMORTH



Wales Integrated Clinical Pathway for Glaucoma and Ocular Hypertension

'A Commentary'

Michael Austin June 2020
(consultant ophthalmologist,
glaucoma specialist, WOPCB chair)

Please note: click on text in blue to follow web links

Introduction

'The Glaucomas' make up a group of related conditions affecting the eye. The chief feature causing loss of sight in glaucoma is a characteristic pattern of loss of nerve fibres from the optic nerve (that connects the eye to the rest of the brain). Basic information relating to glaucoma may be found on the International Glaucoma Association website (see links section).

The purpose of this commentary is to give an overview for any persons who may be unfamiliar with the Wales Glaucoma Pathway (2010) and to place the existing arrangements in the context of current preferred practice patterns such as the guidelines of the National Institute for Health and Care Excellence (NICE, CG85 of 2009 - updated as NG81 in 2017), a new Ophthalmic Common Clinical Competency Framework (OCCCF) for non-medical multidisciplinary team (MDT) members compiled by the various professional stakeholder bodies, together with other recent publications from the United Kingdom Ophthalmology Alliance (UKOA), the European Glaucoma Society and the Colleges of Optometrists (CoO) and Ophthalmologists (RCOphth - see links below).

The Wales Glaucoma Pathway was designed and agreed in 2009-10 as part of the Welsh Government and NHS Wales project *Focus on Ophthalmology (FOO),* itself part of the *Access [to care] 2009* initiative. This venture was supported by all stakeholder groups, from which a comprehensive participation was achieved. This included representation from; patients, The Third Sector, Primary Care, Secondary Care, Optometry, Ophthalmic Nursing, Orthoptics, Ophthalmology, Health Board Management, the NHS Wales Delivery and Support Unit and Welsh Government.

The Glaucoma Pathway that was designed was in turn agreed for implementation by all Health Boards in Wales. These events were timely as they coincided with both a pilot project for MDT working in glaucoma in Wales (led by Cardiff Eye Unit) and the first guidelines for glaucoma from NICE. Further incorporation of the FOO pathways into the Wales National Eye Care Plans has taken place since 2010, and latterly oversight of the pathways has fallen to the Wales Ophthalmic Planned Care Board (WOPCB). Given the time elapsed since the FOO pathways were first agreed, it is appropriate for a review of the pathways in 2020 to ensure relevance and fitness for purpose. To this end, WOPCB Task and Finish Groups have been set up, with tight deadlines for reporting and the Glaucoma Pathway is included in this process.

Fundamentals

The Wales Glaucoma Pathway is shown in the diagram at Annex 1 (attached). The Pathway endorses the tenets of the NICE Guidelines (see link below) and the statements regarding organisation of care as set out by the professional and regulatory bodies of the health care professionals involved with patient care within the Pathway. The chief role of the Pathway in day to day practice is to set out how patients may pass through the various pathway elements during their individual journeys. It is envisaged that health boards will use the pathway design to determine their local models of service delivery as supported by proceedings of their Eye Care Collaborative Groups, business cases and local health economics etc. to serve local needs

Settings within the Pathway

Primary Care Optometric Practice: is usually a patient's first point of contact, acting as the 'front door' of the NHS. Previously known as ophthalmic opticians, optometrists are primary health care specialists trained to examine the eyes to detect defects in vision, signs of injury, ocular diseases or abnormality as well as some problems with general health. They provide patients with comprehensive ocular health assessments, refractions for provision of spectacles and also contact lens fittings. The Welsh Government funds the Eye Health Examination Wales (EHEW) as an addition to the General Ophthalmic Services (GOS). EHEW provides expert eye care to those patients with an eye problem needing urgent attention or those at higher risk of eye disease. Additional examinations and tests regarding possible glaucoma may also be undertaken by EHEW accredited optometrists. Referral may be made if required, to an optometrist with a higher qualification in glaucoma, an Ophthalmic Diagnosis and Treatment Centre (ODTC, see below), Hospital Eye Service consultant ophthalmologist, GP or pharmacist for further treatment or investigation. The College of Optometrists offers a number of higher qualifications in glaucoma (see link). These allow the holders to undertake clinical practice additional to that of core qualifications and EHEW accreditation. Also, the Departments of Health in the United Kingdom have granted optometrists the independent authority to prescribe medications, provided they undergo appropriate training and obtain the necessary qualification. Clinical scenarios relating to glaucoma covered by the various optometric qualifications are set out in the table at Annex 2

Ophthalmic Diagnosis and Treatment Centres (ODTCs): see below in Diagnosis. ODTCs are special to Wales and have been created to allow patients to have care and investigations at the *clinical* interface that sits between Primary Care Optometry and Secondary Care Hospital Eye Service clinics of consultant ophthalmologists. They are a shared common resource. ODTCs for glaucoma are staffed by non-medical glaucoma practitioners (specialist nurses, orthoptists and optometrists) aided by ophthalmic technicians and supported by clerical, administrative and informatics staff. Clinical governance and oversight are provided by a consultant ophthalmologist clinical lead for the Glaucoma Pathway within the Health Board. ODTCs are *'geographically agnostic'* i.e. they may be sited wherever the health board concerned considers best suits its population. Population needs will include environmental

concerns and the carbon footprint of the Pathway. ODTCs may be considered as part of a Community Eye Care service as referenced by the College of Optometrists and the Royal College of Ophthalmologists in that: "*The descriptor 'community' does not imply any particular location. The key is that the service should be delivered by a community of multidisciplinary eye health professionals in the most appropriate settings to provide accessible, timely, high quality network of care to patients across traditional health sector boundaries. [These settings] may include optical practices, hospital-led sites, health centres, or other alternative settings".* ODTCs may be involved in the assessment and care of both new referrals and existing patients deemed suitable for the setting. 'Suitability' here may be assigned by a consultant undertaking triage of new referrals, or the Glaucoma MDT member undertaking a clinic session and requesting a follow-up appointment for an existing patient.

Consultant-led virtual clinic (VC): *(see link to RCOphth standards document).* A 'virtual clinic' is a setting where a patient's clinical scenario is assessed by a specialist without the patient being physically present. Whilst some VC activity may be 'synchronous' e.g. telemedicine consultation via a webcam to discuss management options in real-time, the majority of VCs in the Glaucoma Pathway will be 'asynchronous' in that the patient will not be present when a specialist will be reviewing patients' clinical data alongside examination findings in the clinical record in order to progress assessment and management, as well as answer any questions raised by other MDT members. In the Wales Pathway, the clinical record is to be an electronic patient record (EPR) and available for viewing and making entries by all eye care professionals in all pathway settings. Population size and needs will influence VC configuration and for larger services it is likely a number of MDT members will need to undertake VC work, this will still be consultant-led.

Consultant-led clinic: at present based in Secondary Care Hospital Eye Services (HES, see link for RCOphth service guidance document). This the traditional setting for consultations between patients referred from Primary Care and ophthalmologists. Given the reconfigurations of services in more recent times (e.g. the design of this pathway), consultant-led clinics for glaucoma are increasingly sub-specialist and tend to concentrate on more complex or demanding cases, and those requiring surgical management. Most 'routine' Glaucoma Pathway face to face activity may now take place on the basis of patients being seen by non-medical glaucoma practitioners, supported and overseen by a consultant clinical lead.

<u>Case-finding</u>

At initial presentation, the overwhelming majority of glaucoma pathway cases have no symptoms suggestive of glaucoma and are first identified as potentially having a pathway diagnosis by optometrists in Primary Care practice. This is often at the time of a routine sight test. In Wales, optometrists who have Eye Health Examination Wales accreditation are able to carry out additional tests to optimise the quantity and quality of clinical information to support any suspected diagnosis and aid referral for confirmation of diagnosis and management. Recommendations relating to case-finding and referral are set out in NICE NG81: 1.1.

Diagnosis

Diagnosis is based on the interpretation of history, examination and the results of diagnostic tests. The required tests are set out in NICE NG81: 1.2.1 and include; visual fields, intraocular pressure (IOP) measurement using Goldmann applanation tonometry, central corneal thickness (CCT) measurement, anterior chamber (AC) configuration and AC angle assessment using gonioscopy, together with optic nerve assessment with biomicroscopy and imaging.

In the Wales Glaucoma Pathway, almost always following referral from an optometrist, patients will have their baseline investigations via an ODTC (see above). In an ODTC a patient is able to have all of the required diagnostic tests as well as a clinical consultation with a glaucoma practitioner. The interpretation of any examination findings and test results will be undertaken in accordance with NICE Guidelines and the OCCCF for Glaucoma. Support for the ODTC care is provided by the consultant-led HES glaucoma team. This includes use of a standardised clinical record – which should be electronic – and a virtual clinic, whose output includes plain language information for patients, their general practitioners and optometrists.

Diagnosis of glaucoma is via a consultant ophthalmologist. Diagnosis of OHT and suspected POAG / COAG ('glaucoma suspect status') is via a suitably trained healthcare professional with a specialist qualification in glaucoma and the relevant experience, in accordance with the local model for implementation of the Pathway. Diagnosis may take place anywhere a clinician who is able to make a diagnosis is in possession of sufficient clinical information (see Pathway diagram).

Assessments

These are as above and as set out in NICE NG81: 1.3 and 1.4. Patients may have their assessments in accordance with NICE NG81, with assessments and / or consultations taking place in lines with the local arrangements made by the relevant health board e.g. maximal prudent use of workforce and facilities, matching complexity of decision-making to most appropriate members of the MDT. Care will be patient-centred and take into account issues around travel. The majority of assessments may take place in an ODTC and a significant minority in the consultant-led hospital-based clinics (termed 'Glaucoma Assessment Clinic' in the Pathway Diagram).

Clinical Records

In accordance with the NICE Guidance NG81 and [legacy] Quality Standard (2011 see Annex 3) that – "*Healthcare professionals involved in the care of a person with COAG, suspected COAG or with OHT [will] have appropriate documentation and records available at each clinical encounter"* – patients in Wales will have their consultations, findings, treatments and all relevant matters recorded in their clinical records. From the outset, the clearly stated intention for this pathway was for patient records to be standardised and electronic and accessible by authorised personnel in whatever setting patient care takes place (e.g. optometrist's practice, consultant's clinic, ODTC, virtual clinic).

Treatment

This is as set out in NICE NG81: 1.5. Therapeutic decision making takes into account Pathway sub-diagnoses of ocular hypertension (OHT), glaucoma suspect status and primary open angle [chronic] glaucoma (POAG / COAG) as well as considerations of 'stage of disease', risk of conversion to / progression of glaucomatous optic neuropathy, quality of IOP control and risk of glaucoma-related sight impairment during anticipated lifetime. Treatment decisions within the Pathway are made by clinicians possessing the required qualifications, competencies and experience. They may take place anywhere a clinician who is able to make them has sufficient clinical information e.g. in an optometrist's practice, ODTC, virtual clinic or consultant's clinic (see Pathway diagram). Decisions regarding offers of laser treatments and glaucoma surgery will be via consultations with appropriately qualified and experienced members of the consultant-led team that will be responsible for carrying out the interventions concerned. All treatment initiations and changes will be on the basis of informed consent following provision of relevant information as to benefits and risks of the various options (in writing and including the option of no intervention). Governance and oversight for any glaucoma patient's treatment within the Pathway is via the patient's named consultant ophthalmologist.

Organisation of Care

In Wales, patient flows between the various elements and providers are in accordance with the Wales Glaucoma Pathway, set out in Annex 1. Organisation of care in terms of utilisation of the clinical skills, knowledge and competencies of the MDT workforce is set out in NICE NG81: 1.6. Health boards will be able to configure their local models of service delivery so as to meet the needs of their populations whilst working within the requirements of the Pathway, NICE NG81, the regulatory bodies and Principles of Prudent Healthcare.

Patients in Wales with a diagnosis of a Glaucoma Pathway condition will have treatment as outlined in NG81: 1.5. Treatment plans will be individualised for each patient based on their circumstances and clinical needs as agreed with the named clinician with overall responsibility. Much of this care may be provided by non-medical MDT members and ODTCs – with consultant oversight where required.

In the HES Glaucoma clinic setting, patients with more complex needs are able to be seen by a consultant ophthalmologist and their team. These consultations will often involve options to address inadequate control of IOP that might include some changes in medications, or laser treatments or glaucoma surgery, or combinations of these. It is envisaged that within the Wales Glaucoma Pathway these HES clinics will provide some 25% of 'whole pathway' face to face consultations.

Patients in the Glaucoma Pathway, whether receiving treatment or not, will undergo regular monitoring of their condition and schemes for how this takes place are set out in NG81. In the context of the Pathway, 'monitoring' is taken to mean the checking of a patient's symptoms and any concerns, measuring the various clinical parameters and undertaking tests so as to be able to detect any changes that may require specific management. It does

not include making a new diagnosis or making any treatment decision unless the clinician concerned has the necessary competencies and authority to act.

Traditionally, assessments and treatments for glaucoma, ocular hypertension and 'glaucoma suspect status' have been via consultant-led clinics of the Hospital Eye Service. In recent times other 'qualified providers' have been able to contribute to care. This includes a significant number of optometrists who have additional qualifications in glaucoma from the College of Optometrists (certificate, higher certificate and diploma) and independent prescribing (IP). The mapping of glaucoma pathway clinical scenarios and the various qualifications, including IP, is set out in the table at Annex 2.
Clinical leads and service managers should be aware of the constraints of levels of qualifications within their potential whole pathway workforce when planning local models of service delivery and configuring their MDTs so as to match patients' needs with sufficient team members able to provide them.

During their time in the Glaucoma Pathway, patients will attend the most appropriate setting according to their needs, usually as determined as a result of the outcome of their previous consultation(s) as overseen by the clinician responsible for their care. The ODTC will chiefly be concerned with assessment of patients who are newly referred and those deemed of sufficient stability and / or low level of risk of progression as to be able to attend there rather than the consultant-led clinic. The consultant-led clinic will chiefly be concerned with patients needing sub-specialist input into management decisions. This will usually be in the context of failure in achieving IOP control with eye drops / laser treatment alone or where there may be signs of disease progression risking significant vision impairment.

Discharge

Discharge from the pathway will be by the clinician with responsibility for the patient's care and is covered in NICE NG81 at 1.4 and 1.7. This will usually be on the basis of the patient's diagnosis not requiring either treatment or monitoring within the Pathway. Patients with ongoing care issues will have these outlined in plain language in a written form (plan) that will be given to them and shared with their GP and optometrist.

Providing information

The Wales Pathway endorses the provision of information and opportunity for discussion and answering of questions as set out in NICE NG81: 1.7. Patients for discharge will be provided with information relating to their suspected or confirmed diagnosis at each contact with a health care professional within the Pathway. Written information will be approved by health boards' editorial structures or from 'reliable sources' such as the eye care professional bodies, the International Glaucoma Association and the Royal National Institute of Blind People (RNIB).

Annex 1. Integrated Clinical Pathway for Patients with Glaucoma and Ocular Hypertension in Wales: Pathway Diagram (attached)

Annex 2. Contingency table: scenarios related to chronic (primary) open angle glaucoma and related conditions, and care by optometrists in a Primary Care setting in Wales

Annex 3. NICE Quality Standard QS180 (2019) Serious Eye Disorders (as relating to Glaucoma) and legacy glaucoma pathway quality standards from NICE QS 2011

Links:

The International Glaucoma Association (https://www.glaucoma-association.com/)
now 'Glaucoma UK'
https://glaucoma.uk/

NICE Guidelines:
Glaucoma: diagnosis and management NICE guideline [NG81] Published: 01 November 2017

https://www.nice.org.uk/guidance/ngNG81

NICE Quality Standard QS180 (2019) Serious eye disorders

https://www.nice.org.uk/guidance/qs180

NICE Quality Standard QS7(2011) Glaucoma in adults [for use in support of local pathways]

https://www.nice.org.uk/guidance/qs180/documents/previous-version-of-quality-standard

The Royal College of Ophthalmologists: The Way Forward

https://www.rcophth.ac.uk/standards-publications-research/the-way-forward/

The International Glaucoma Association & UKOA Glaucoma
Patient Standards for Glaucoma

http://www.glaucoma-association.com/wp-iga/wp-content/uploads/2019/08/Patient-Standards-for-Glaucoma-UKOA-Final.pdf

Ophthalmic Common Clinical Competency Framework / Ophthalmic Practitioner Training (Curriculum)

https://www.hee.nhs.uk/our-work/advanced-clinical-practice/ophthalmology-common-clinical-competency-framework-curriculum

Ophthalmic Common Clinical Competency Framework – RCOphth website

https://www.rcophth.ac.uk/professional-resources/new-common-clinical-competency-framework-to-standardise-competences-for-ophthalmic-non-medical-healthcare-professionals/

College of Optometrists: Clinical Management Guidelines – primary open angle glaucoma

https://www.college-optometrists.org/guidance/clinical-management-guidelines/glaucoma-primary-open-angle-poag-.html

College of Optometrists: Clinical Management Guidelines – ocular hypertension

https://www.college-optometrists.org/guidance/clinical-management-guidelines/ocular-hypertension-oht-.html

College of Optometrists: Higher qualifications in glaucoma

https://www.college-optometrists.org/cpd-and-cet/training-and-qualifications/higher-qualifications/courses-and-providers/higher-qualifications-in-glaucoma.html

College of Optometrists & Royal College of Ophthalmologists: Ophthalmic Services Guidance: Primary Eye Care, Community Ophthalmology and General Ophthalmology (England)

https://www.college-optometrists.org/resourceLibrary/ophthalmic-services-guidance--primary-eye-care--community-ophthalmology-and-general-ophthalmology.html

RNIB – The Royal National Institute of Blind People: homepage

https://www.rnib.org.uk

The European Glaucoma Society: Terminology and Guidelines for Glaucoma

https://www.eugs.org/eng/guidelines.asp

Welsh Government: Prudent Healthcare

https://gov.wales/sites/default/files/publications/2019-04/securing-health-and-well-being-for-future-generations.pdf

Eye Care Wales

http://www.eyecare.wales.nhs.uk/home

Standards for Virtual Clinics in Glaucoma Care in the NHS Hospital Eye Service

https://www.rcophth.ac.uk/wp-content/uploads/2017/03/Virtual-Glaucoma-Clinics.pdf

RCOphth Service Guidance: Ophthalmology Outpatients – safe & efficient processes (2018)

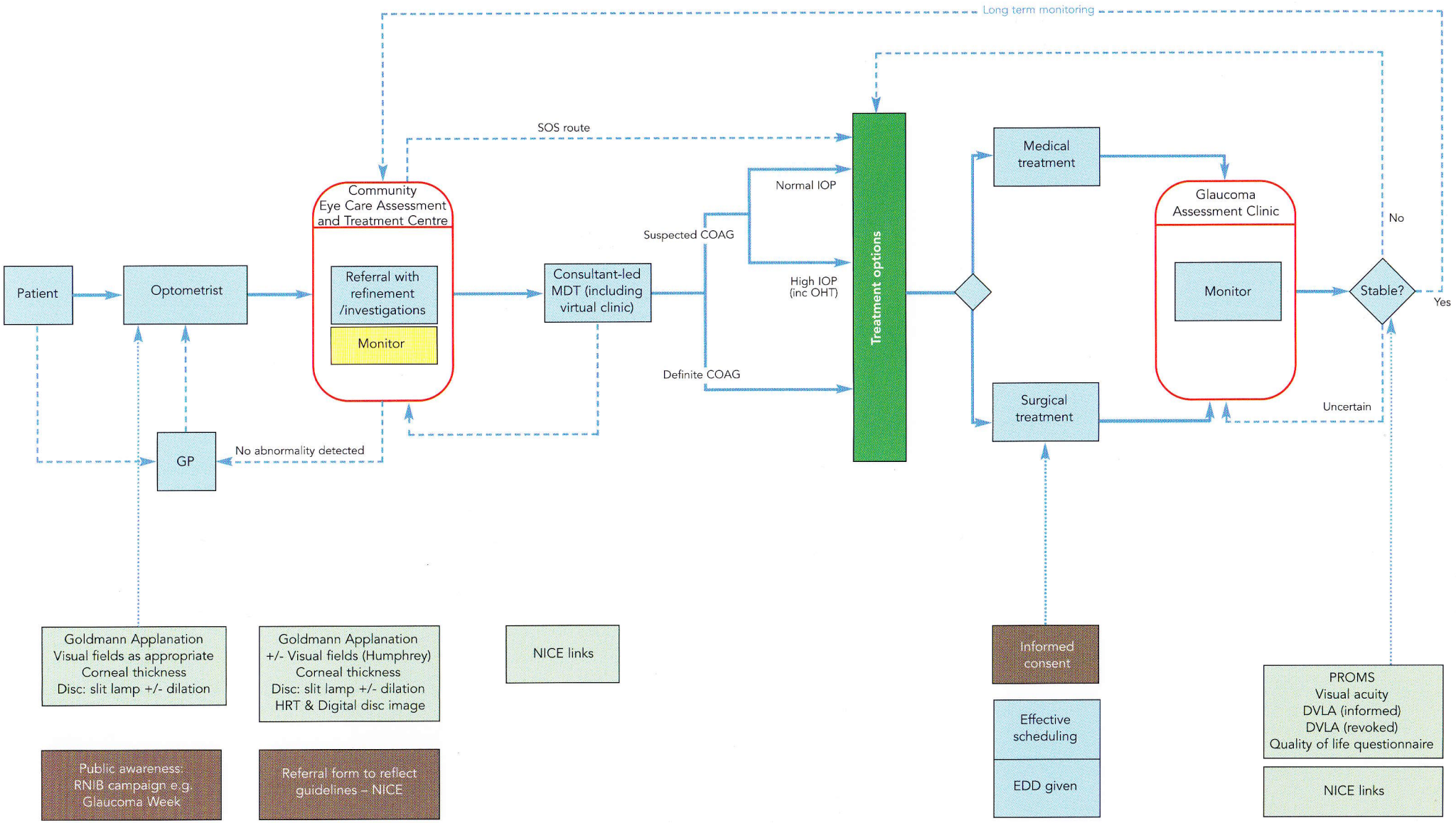
https://www.rcophth.ac.uk/wp-content/uploads/2018/02/Ophthalmology-outpatients-–-safe-and-efficient-processes.pdf

Annex 1 Wales Glaucoma Pathway

GIG CYMRU NHS WALES

Glaucoma Pathway

DELIVERY AND SUPPORT UNIT
UNED CYFLENWI A CHYMORTH



Contingency table: scenarios related to chronic (primary) open angle glaucoma and related conditions, and care by optometrists

in a Primary Care setting in Wales, independent of supervision by a consultant ophthalmologist or appropriately qualified non-medical practitioner*

	Core competence as optometrist			WECS EHEW accredited			Professional Certificate in Glaucoma			Higher Certificate in Glaucoma			Diploma in Glaucoma	
preliminary/ working diagnosis as OH* / GS* / COAG* (for purposes of referral where necessary)	YES			YES			YES			YES			YES	
diagnosis as OHT	NO			NO			NO			YES			YES	
diagnosis as GS	NO			NO			NO			YES			YES	
diagnosis as COAG** (= GON on basis of COAG and not 'other glaucoma')	NO			NO			NO			NO			**NO**	
monitoring of OHT (not on medication)	NO			NO			**YES**			**YES**			**YES**	
monitoring of OHT (on medication)	NO			NO			**YES**			**YES**			**YES**	
monitoring of GS (not on medication)	NO			NO			YES			YES			YES	
monitoring of GS (on medication)	NO			NO			YES			YES			YES	
monitoring of COAG (on medication)	NO			NO			NO			NO			YES	
		&IP			**&IP**			**&IP**			**&IP**			**&IP**
management of OHT - initial, including starting medication(s)	NO	NO		NO	NO		NO	NO		*not easily*' (see note A)	**YES**		*not easily*' (see note A)	**YES**
management of OHT - modification, including amending / stopping medication(s)	NO	NO		NO	NO		NO	NO		*not easily*' (see note A)	**YES**		*not easily*' (see note A)	**YES**
management of GS - initial, including starting medication(s)	NO	NO		NO	NO		NO	NO		*not easily*' (see note A)	YES		*not easily*' (see note A)	YES
management of GS - modification, including amending / stopping medication(s)	NO	NO		NO	NO		NO	NO		*not easily*' (see note A)	YES		*not easily*' (see note A)	YES
management of COAG - initial, including starting medication(s)	NO	NO		NO	NO		NO	NO		NO	NO		NO	NO
management of COAG - modification, including amending / stopping medication(s)	NO	NO		NO	NO		NO	NO		NO	NO		*not easily*' (see note A)	**YES**

* KEY:
WECS EHEW = Wales Eye Care Services Eye Health Examination Wales

&IP = optometrist also has independent prescribing qualification

OH = ocular hypertension
GS = glaucoma suspect status
COAG = chronic (primary) open angle glaucoma
GON = glaucomatous optic neuropathy

** i.e. a working assumption that glaucomas 'other than COAG' not covered and therefore normally under Hospital Eye Service or supervised care

GREEN fill	=	Likelihood of greatest numbers of patients across whole of glaucoma pathway

in the context of this pathway, for any given scenario, a YES in the relevant cell in the table indicates a level of qualification as sufficient for being appropriately qualified. This includes supervision in relation to the relevant scenario.

YES = wholly independently of supervision by consultant or appropriately qualified non-medical practitioner

NO = supervision by consultant or appropriately qualified non-medical practitioner required for shared care glaucoma consultations in Primary Care

monitoring = taking history, performing examination, being able to detect change in clinical or disease status, recording findings independent of supervision, and able to refer to appropriate colleague if required. Does not include making therapeutic decisions, or initiating or modifying treatment.

managing = reviewing clinical or disease status, making therapeutic decision based on scenario and initiating or modifying treatment, independent of supervision

Note A (Angela Whitaker, WOPEC)

Independent prescribing is not required by NICE for a clinician to initiate or modify treatment, but an alternative non-medical prescribing mechanism such as patient group directions would be needed. Therefore to discharge patients to current optometric primary care, IP would be necessary in the absence of an alternative prescribing mechanism.

Michael Austin and Angela Whitaker for Wales Ophthalmic Planned Care Board 2020

NICE National Institute for Health and Care Excellence

NICE guideline

Glaucoma: diagnosis and management

NICE guideline

Published: 1 November 2017
www.nice.org.uk/guidance/ng81

Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guideline replaces CG85.

This guideline is the basis of QS180.

Overview

This guideline covers diagnosing and managing glaucoma in people aged 18 and over. It includes recommendations on testing and referral (case-finding) for chronic open angle glaucoma and ocular hypertension, and on effective diagnosis, treatment and reassessment to stop these conditions progressing.

We have produced a large print version of this guideline which is available to download in tools and resources.

Who is it for?

- Healthcare professionals
- Commissioners and providers of eye care services
- Adults with chronic open angle glaucoma or ocular hypertension, or who are at risk of developing glaucoma, their families and carers

Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

1.1 Case-finding

The recommendations on case-finding are for primary eye care professionals before referral for diagnosis of chronic open angle glaucoma (COAG) and related conditions, and are separate from a sight test.

1.1.1 Before referral for further investigation and diagnosis of COAG and related conditions, offer all of the following tests:

- central visual field assessment using standard automated perimetry (full threshold or supra-threshold)
- optic nerve assessment and fundus examination using stereoscopic slit lamp biomicroscopy (with pupil dilatation if necessary), and optical coherence tomography (OCT) or optic nerve head image if available
- intraocular pressure (IOP) measurement using Goldmann-type applanation tonometry
- peripheral anterior chamber configuration and depth assessments using gonioscopy or, if not available or the patient prefers, the van Herick test or OCT. **[2017]**

1.1.2 Do not base a decision to refer solely on IOP measurement using non-contact tonometry. **[2017]**

1.1.3 Do not refer people who have previously been discharged from hospital eye services after assessment for COAG and related conditions unless clinical circumstances have changed and a new referral is needed. **[2017]**

1.1.4 Before deciding to refer, consider repeating visual field assessment and IOP measurement on another occasion to confirm a visual field defect or IOP of 24 mmHg or more, unless clinical circumstances indicate urgent or emergency referral is needed. **[2017]**

1.1.5 Refer for further investigation and diagnosis of COAG and related conditions, after considering repeat measures as in recommendation 1.1.4, if:

- there is optic nerve head damage on stereoscopic slit lamp biomicroscopy **or**
- there is a visual field defect consistent with glaucoma **or**
- IOP is 24 mmHg or more using Goldmann-type applanation tonometry. **[2017]**

1.1.6 Provide results of all examinations and tests with the referral. **[2017]**

1.1.7 Advise people with IOP below 24 mmHg to continue regular visits to their primary eye care professional. **[2017]**

These recommendations are for people planning and providing eye care services before referral

1.1.8 People planning and providing eye care services should use a service model that includes Goldmann-type applanation tonometry before referral for diagnosis of COAG and related conditions. **[2017]**

1.1.9 People planning eye care services should consider commissioning referral filtering services (for example, repeat measures, enhanced case-finding, or referral refinement) for COAG and related conditions. **[2017]**

1.2 Diagnosis

1.2.1 To diagnose COAG and related conditions, offer all of the following tests:

- visual field assessment using standard automated perimetry (central thresholding test), repeated if necessary to establish severity at diagnosis
- optic nerve assessment and fundus examination using stereoscopic slit lamp biomicroscopy, with pupil dilatation
- IOP measurement using Goldmann applanation tonometry (slit lamp mounted)

- peripheral anterior chamber configuration and depth assessments using gonioscopy
- central corneal thickness (CCT) measurement. [2017]

1.2.2 Adopt professional[1]/Department of Health[2] guidance to reduce the risk of transmitting infective agents via contact tonometry or gonioscopy. [2009]

1.2.3 Use the van Herick peripheral anterior chamber depth assessment if clinical circumstances rule out gonioscopy (for example, when people with physical or learning disabilities are unable to participate in the examination). [2009]

1.2.4 Obtain an optic nerve head image at diagnosis for baseline documentation (for example, a stereoscopic optic nerve head image or OCT). [2009, amended 2017]

1.2.5 After referral, consider an early assessment appointment when there is clinical concern based on the information provided. [2017]

1.2.6 At the time of diagnosis of ocular hypertension (OHT), assess risk of future visual impairment, taking account of risk factors such as:

- level of IOP
- CCT
- family history
- life expectancy. [2017]

1.3 Standard practice for all assessments

1.3.1 Ensure that all of the following are made available at each clinical episode to all healthcare professionals involved in a person's care:

- records of all previous tests and images relevant to COAG and OHT assessment
- records of past medical history which could affect drug choice
- current systemic and topical medication
- glaucoma medication record

- drug allergies and intolerances. **[2009]**

1.3.2 Use alternative methods of assessment if clinical circumstances rule out standard methods (for example, when people with physical or learning disabilities are unable to participate in the examination). **[2009]**

1.3.3 Ensure that all machines and measurement instruments are calibrated regularly according to the manufacturers' instructions. **[2009]**

1.4 Reassessment

Reassessment tests

1.4.1 At each assessment, offer the following tests to people with COAG, people suspected of having COAG and people with OHT:

- Goldmann applanation tonometry (slit lamp mounted)
- anterior segment slit lamp examination with van Herick peripheral anterior chamber depth assessment when clinically indicated. **[2017]**

1.4.2 When clinically indicated, repeat gonioscopy, for example, where a previous examination has been inconclusive or where there is suspicion of a change in clinical status of the anterior chamber angle. **[2017]**

1.4.3 When clinically indicated, repeat visual field testing using standard automated perimetry (central thresholding test) for people with COAG and those suspected of having visual field defects who are being investigated for possible COAG (see tables 2 and 3 for recommended reassessment intervals). **[2009, amended 2017]**

1.4.4 When clinically indicated, repeat visual field testing using either a central thresholding test or a supra-threshold test for people with OHT and those suspected of having COAG whose visual fields have previously been documented by standard threshold automated perimetry (central thresholding test) as being normal (see tables 1 and 2 for recommended reassessment intervals). **[2009, amended 2017]**

1.4.5 When a visual field defect has previously been detected, use the same

measurement strategy for each visual field assessment. [2009]

1.4.6 When clinically indicated, repeat assessment of the optic nerve head (for example, stereoscopic slit lamp biomicroscopy or imaging). [2017]

1.4.7 When a change in optic nerve head status is detected by stereoscopic slit lamp biomicroscopy, obtain a new optic nerve head image for the person's records to provide a fresh benchmark for future assessments. [2009]

1.4.8 When an adequate view of the optic nerve head and surrounding area is unavailable at reassessment, people should have their pupils dilated before stereoscopic slit lamp biomicroscopy or optic nerve head imaging is repeated. [2009]

When to reassess

People with COAG, suspected COAG and OHT

1.4.9 At each assessment, re-evaluate risk of conversion to COAG and risk of sight loss to set time to next assessment. [2017]

1.4.10 At each assessment, ask about general health and, if appropriate, factors affecting adherence to treatment, including cognitive impairment and any treatment side effects. [2017]

People with treated OHT (baseline IOP 24 mmHg or more) and a normal optic nerve head and visual field at most recent assessment

1.4.11 For people with treated OHT (baseline IOP of 24 mmHg or more) and a normal optic head and visual field at the most recent assessment:

- use clinical judgement to assess control of IOP and risk of conversion to COAG, and
- reassess according to table 1. [2017]

Table 1 Time to next assessment for people being treated for OHT

Conversion from OHT to COAG	Control of IOP	Time to next assessment[1]

Not detected or uncertain conversion[2]	No	Review management plan and reassess between 1 and 4 months
Uncertain conversion[2]	Yes	Reassess between 6 and 12 months
No conversion detected	Yes	Reassess between 18 and 24 months
Conversion	No or yes	See recommendations on the diagnosis and reassessment of COAG

[1] Use clinical judgement to decide when the next appointment should take place within the recommended interval.

[2] Uncertain conversion includes having insufficient accurate information (perhaps because the person was unable to participate in the assessment).

People with suspected COAG

1.4.12 For people with suspected COAG:

- use clinical judgement to assess control of IOP and risk of conversion to COAG (optic nerve head damage and visual field defect), and
- reassess according to table 2. [2017]

Table 2 Time to next assessment for people with suspected COAG

Conversion to COAG	Control of IOP	Time to next assessment[1]
Not detected or uncertain conversion[2]	No	Review management plan and reassess between 1 and 4 months
Uncertain conversion[2]	Yes	Reassess between 6 and 12 months
No conversion detected	Yes	Reassess between 12 and 18 months
Conversion	No or yes	See recommendations on the diagnosis and reassessment of COAG

[1] Use clinical judgement to decide when the next appointment should take place within the recommended interval.

[2] Uncertain conversion includes having insufficient accurate information (perhaps because the person was unable to participate in the assessment).

People with COAG

1.4.13 For people with COAG:

- use clinical judgement to assess risk of COAG progression to sight loss, and
- reassess according to table 3. [2017]

Table 3 Time to next assessment for people with COAG

Progression of COAG	Control of IOP	Time to next assessment[1]
Not detected	No	Review treatment plan and reassess between 1 and 4 months
Uncertain progression[2] or progression	No	Review treatment plan and reassess between 1 and 2 months
No progression detected and low clinical risk	Yes	Reassess between 12 and 18 months
No progression detected and high clinical risk	Yes	Reassess between 6 and 12 months
Uncertain progression[2] or progression	Yes	Review treatment plan and reassess between 2 and 6 months

[1] Use clinical judgement to decide when the next appointment should take place within the recommended interval.

[2] Uncertain progression includes having insufficient accurate information (perhaps because the person was unable to participate in the assessment).

Discharge back to primary care

1.4.14 Discharge people back to primary eye care services if:

- they were referred for OHT but do not need treatment
- they were referred for suspected COAG but this is no longer suspected.

  Advise people that they should continue with regular visits to their primary eye care professional, at clinically appropriate intervals. [2017]

1.4.15 Give a discharge summary to people who have been assessed and discharged to primary care. Send a copy to their GP and, with patient consent, copy the relevant information to the primary eye care professional nominated by the patient. Advise people to take their discharge summary with them when attending future sight tests. **[2017]**

1.5 Treatment

1.5.1 Take into account any cognitive and physical impairments when making decisions about management and treatment. **[2017]**

1.5.2 Check that there are no relevant comorbidities or potential drug interactions before offering pharmacological treatment. **[2009]**

Treatment for people with OHT

1.5.3 Offer a generic prostaglandin analogue (PGA)[3] to people with IOP of 24 mmHg or more (OHT) if they are at risk of visual impairment within their lifetime (see recommendation 1.2.6). **[2017]**

1.5.4 Do not offer treatment to people with OHT who are not at risk of visual impairment in their lifetime. Advise people to continue regular visits to their primary eye care professional, at clinically appropriate intervals. **[2017]**

1.5.5 Offer another pharmacological treatment to people with an IOP of 24 mmHg or more who cannot tolerate their current treatment. The first choice should be an alternative generic PGA, if available, and if this is not tolerated, offer a beta-blocker. If none of these options are tolerated, offer non-generic PGA, carbonic anhydrase inhibitors, sympathomimetics, miotics or a combination of treatments. **[2017]**

1.5.6 Offer a drug from another therapeutic class (beta-blocker, carbonic anhydrase inhibitor[4] or sympathomimetic) to people with an IOP of 24 mmHg or more whose current treatment is not reducing IOP sufficiently to prevent the risk of progression to sight loss. Topical drugs from different therapeutic classes may be needed at the same time to control IOP. **[2009, amended 2017]**

1.5.7 Refer people whose IOP cannot be reduced sufficiently with pharmacological

treatment to prevent the risk of progression to sight loss to a consultant ophthalmologist to discuss other options. **[2009]**

1.5.8 Offer preservative-free eye drops to people who have an allergy to preservatives or people with clinically significant and symptomatic ocular surface disease, but only if they are at high risk of conversion to COAG. **[2009, amended 2017]**

Treatment for people with suspected COAG

1.5.9 Do not offer treatment to people with suspected COAG and IOP less than 24 mmHg. Advise people to continue regular visits to their primary eye care professional, at clinically appropriate intervals. **[2017]**

1.5.10 Offer a generic PGA[3] to people with suspected COAG and IOP of 24 mmHg or more, in line with the recommendations on treatment for people with OHT. **[2017]**

Stopping treatment for people with OHT or suspected COAG

1.5.11 Discuss the benefits and risks of stopping treatment with people with OHT or suspected COAG who have both:

- a low risk of ever developing visual impairment within their lifetime
- an acceptable IOP.

If a person decides to stop treatment after this discussion, offer to assess their IOP in 1 to 4 months with further reassessment if clinically indicated. **[2009]**

Treatment for people with COAG

1.5.12 Offer a generic PGA[3] to people with COAG. **[2017]**

1.5.13 Offer people with advanced COAG, surgery with pharmacological augmentation (MMC[5]) as indicated. Offer them information on the risks and benefits associated with surgery. **[2009, amended 2017]**

1.5.14 Offer people who present with advanced COAG and who are listed for surgery,

interim treatment with a generic PGA[3]. **[2009, amended 2017]**

1.5.15 Encourage people to continue with the same pharmacological treatment unless:

- their IOP cannot be reduced sufficiently to prevent the risk of progression to sight loss
- there is progression of optic nerve head damage
- there is progression of visual field defect
- they cannot tolerate the drug. **[2009]**

1.5.16 Ask about adherence to treatment and check the eye drop instillation technique in people with COAG whose IOP has not been reduced sufficiently to prevent the risk of progression to sight loss despite pharmacological treatment. If adherence and eye drop instillation technique are satisfactory offer 1 of the following:

- a drug from another therapeutic class (a beta-blocker, carbonic anhydrase inhibitor[4] or sympathomimetic); topical drugs from different therapeutic classes may be needed at the same time to control IOP
- laser trabeculoplasty
- surgery with pharmacological augmentation (MMC[5]) as indicated.

  If the drug treatment option is chosen, after trying drugs from 2 therapeutic classes, consider offering surgery with pharmacological augmentation (MMC[5]) as indicated or laser trabeculoplasty. **[2009, amended 2017]**

1.5.17 Offer surgery with pharmacological augmentation (MMC[5]) as indicated to people with COAG who are at risk of progressing to sight loss despite treatment. Offer them information on the risks and benefits associated with surgery. **[2009, amended 2017]**

1.5.18 Consider offering people with COAG who cannot tolerate a treatment:

- a drug from another therapeutic class (a beta-blocker, carbonic anhydrase inhibitor[4] or sympathomimetic) **or**

- preservative-free eye drops if there is evidence that the person is allergic to the preservative or has clinically significant and symptomatic ocular surface disease.

  After trying drugs from 2 therapeutic classes, consider offering surgery with pharmacological augmentation (MMC[5]) as indicated or laser trabeculoplasty. **[2009, amended 2017]**

1.5.19 After surgery offer people with COAG whose IOP has not been reduced sufficiently to prevent the risk of progression to sight loss 1 of the following:

- pharmacological treatment; topical drugs from different therapeutic classes may be needed at the same time to control IOP
- further surgery
- laser trabeculoplasty or cyclodiode laser treatment. **[2009, amended 2017]**

1.5.20 Offer people with COAG who prefer not to have surgery or for whom surgery is not suitable:

- pharmacological treatment; topical drugs from different therapeutic classes may be needed at the same time to control IOP
- laser trabeculoplasty or cyclodiode laser treatment. **[2009, amended 2017]**

1.6 Organisation of care

1.6.1 Refer people with suspected optic nerve damage or repeatable visual field defect, or both, to a consultant ophthalmologist for consideration of a definitive diagnosis and formulation of a management plan. **[2009]**

1.6.2 Diagnosis of OHT and suspected COAG and formulation of a management plan should be made by a suitably trained healthcare professional with:

- a specialist qualification and
- relevant experience. **[2009, amended 2017]**

1.6.3 Be aware that holding an independent or non-medical prescribing qualification alone (without a specialist qualification relevant to the case complexity of glaucoma being managed) is insufficient for managing glaucoma and related

conditions. **[2017]**

1.6.4 Healthcare professionals involved in the diagnosis of OHT and COAG suspect status and preliminary identification of COAG should be trained in case detection and referral refinement and be able to identify abnormalities based on relevant clinical tests and assessments. They should understand the principles of diagnosis of OHT and COAG and be able to perform and interpret all of the following:

- medical and ocular history
- differential diagnosis
- Goldmann applanation tonometry (slit lamp mounted)
- standard automated perimetry (central thresholding test)
- central supra-threshold perimetry
- stereoscopic slit lamp biomicroscopic examination of anterior segment
- examination of the posterior segment using a slit lamp binocular indirect ophthalmoscopy
- gonioscopy
- van Herick peripheral anterior chamber depth assessment
- CCT measurement. **[2009]**

1.6.5 People with OHT, suspected COAG or COAG should have monitoring and treatment from a trained healthcare professional who has all of the following:

- a specialist qualification
- relevant experience
- ability to detect a change in clinical status. **[2009, amended 2017]**

1.6.6 Healthcare professionals involved in the monitoring and treatment of OHT, suspected COAG and established COAG should be trained to make management decisions on all of the following:

- risk factors for conversion to COAG
- coexisting pathology
- risk of sight loss
- monitoring and detecting a change in clinical status (for example, visual field changes, stereoscopic slit lamp biomicroscopic examination of anterior segment and posterior segment)
- pharmacology of IOP-lowering drugs
- treatment changes for COAG, suspected COAG and OHT (with consideration given to relevant contraindications and interactions). [2009]

1.6.7 People with a confirmed diagnosis of OHT or suspected COAG and who have an established management plan may have monitoring (but not treatment) from a suitably trained healthcare professional with knowledge of OHT and COAG, relevant experience and ability to detect a change in clinical status. The healthcare professional should be able to perform and interpret all of the following:

- Goldmann applanation tonometry (slit lamp mounted)
- standard automated perimetry (central thresholding test)
- central supra-threshold perimetry (this visual field strategy may be used for monitoring OHT or suspected COAG when the visual field is normal)
- stereoscopic slit lamp biomicroscopic examination of the anterior segment
- van Herick peripheral anterior chamber depth assessment
- examination of the posterior segment using slit lamp binocular indirect ophthalmoscopy. [2009]

1.6.8 Healthcare professionals who diagnose, treat or monitor independently of consultant ophthalmologist supervision should take full responsibility for the care they provide. [2009]

1.7 Providing information

1.7.1 Offer people the opportunity to discuss their diagnosis, referral, prognosis, treatment and discharge, and provide them with relevant information in an accessible format at initial and subsequent visits. This may include information on the following:

- their specific condition (OHT, suspected COAG and COAG), its life-long implications and their prognosis for retention of sight
- that COAG in the early stages and OHT and suspected COAG are symptomless
- that most people having treatment for COAG will have good quality of life and not go blind
- that once lost, sight cannot be recovered
- that glaucoma can run in families and that family members may wish to be tested for the condition
- the importance of the person's role in their own treatment – for example, the ongoing regular application of eye drops to preserve sight
- the different types of treatment options, including mode of action, frequency and severity of side effects, and risks and benefits of treatment, so that people are able to take an active part in decision-making (see NICE's guideline on medicines optimisation)
- how to apply eye drops, including technique (punctal occlusion and devices) and hygiene (storage)
- the need for regular monitoring as specified by the healthcare professional
- methods of investigation during assessment
- how long each appointment is likely to take and whether the person will need any help to attend (for example, driving soon after pupil dilatation would be inadvisable)
- the eye clinic liaison officer (ECLO)
- support organisations and support groups
- compliance aids (such as dispensers) available from their GP or community pharmacist

- Letter of Vision Impairment (LVI), Referral of Vision Impairment (RVI) and Certificate of Vision Impairment (CVI), registration
- Driver and Vehicle Licensing Agency (DVLA) regulations. **[2009, amended 2017]**

Terms used in this guideline

COAG and related conditions

These include COAG, OHT and suspected COAG.

Enhanced case-finding

Enhanced community case-finding services use slit lamp mounted Goldmann-type applanation tonometry, dilated slit lamp indirect biomicroscopy and other tests deemed necessary by the healthcare professional.

Hospital-based triage

A hospital-based risk assessment shortly after referral. Initial tests are performed to determine what happens next. For example, people at a low risk following initial testing by a nurse or technician may be discharged whereas those at higher risk may be directed to a more senior member of the assessment and diagnostic team, such as a consultant ophthalmologist.

Primary eye care professionals

These include optometrists, GPs with a special interest in ophthalmology and community orthoptists.

Referral filtering

A general term for any type of accuracy checking before referral to hospital eye services. Referral filtering may take the form of 'repeat measures', 'enhanced case-finding', 'referral refinement', 'hospital-based triage' or 'administrative paper-based triage'.

Referral refinement

A 2-tier assessment in which initial evidence of abnormality found during case-finding or screening is validated by an enhanced assessment, which adds value beyond that achieved through a simple 'repeat measures' scheme. A referral refinement service performs tests to diagnose OHT and

suspected COAG and interprets the results in the light of clinical findings. Specialist practitioners who deliver this service independently have the qualifications and experience set out in the recommendations on organisation of care. Practitioners providing a referral refinement service should be qualified to make a diagnosis of OHT and suspected glaucoma, and to carry out gonioscopy to exclude angle-closure glaucoma.

Repeat measures

The repeated measurement of parameters related to the diagnosis of glaucoma. A simple repeat measures scheme may involve repeat measurement of IOP only. Other repeat measures schemes may also include repeated measurement of visual fields and other relevant ocular parameters when clinically necessary.

Sight loss

Sight loss in glaucoma is visual damage that manifests as blind spots in the field of vision. Early on these are mostly asymptomatic with many people being unware of a problem. Sight loss may progress to visual impairment and eventually become symptomatic.

Sight test

A sight test determines whether or not a person has a sight defect, and if so what is needed to correct, remedy or relieve it. An optometrist performing a sight test has to conduct the examinations specified in the Sight Testing (Examination and Prescription) (No 2) Regulations 1989. These include an internal and external examination of the eyes and any other examinations needed to detect signs of injury, disease or abnormality in the eye or elsewhere.

Visual impairment

A severe reduction in vision, which cannot be corrected with standard glasses or contact lenses and reduces a person's ability to function in a visual environment.

[1] See Royal College of Ophthalmologists' Ophthalmic Services Guidance.

[2] See Minimise transmission risk of CJD and vCJD in healthcare settings.

[3] At the time of publication (November 2017), not all generic PGAs had a UK marketing authorisation for first-line treatment. The prescriber should follow relevant professional guidance,

taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Prescribing guidance: prescribing unlicensed medicines for further information.

[4] At the time of publication (November 2017), some carbonic anhydrase inhibitors were licensed for use only when beta-blockers were not tolerated or were contraindicated. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Prescribing guidance: prescribing unlicensed medicines for further information.

[5] At the time of publication (November 2017), MMC did not have a UK marketing authorisation for this indication. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Prescribing guidance: prescribing unlicensed medicines for further information.

Putting this guideline into practice

NICE has produced tools and resources to help you put this guideline into practice.

Putting recommendations into practice can take time. How long may vary from guideline to guideline, and depends on how much change in practice or services is needed. Implementing change is most effective when aligned with local priorities.

Changes recommended for clinical practice that can be done quickly – like changes in prescribing practice – should be shared quickly. This is because healthcare professionals should use guidelines to guide their work – as is required by professional regulating bodies such as the General Medical and Nursing and Midwifery Councils.

Changes should be implemented as soon as possible, unless there is a good reason for not doing so (for example, if it would be better value for money if a package of recommendations were all implemented at once).

Different organisations may need different approaches to implementation, depending on their size and function. Sometimes individual practitioners may be able to respond to recommendations to improve their practice more quickly than large organisations.

Here are some pointers to help organisations put NICE guidelines into practice:

1. **Raise awareness** through routine communication channels, such as email or newsletters, regular meetings, internal staff briefings and other communications with all relevant partner organisations. Identify things staff can include in their own practice straight away.

2. **Identify a lead** with an interest in the topic to champion the guideline and motivate others to support its use and make service changes, and to find out any significant issues locally.

3. **Carry out a baseline assessment** against the recommendations to find out whether there are gaps in current service provision.

4. **Think about what data you need to measure improvement** and plan how you will collect it. You may want to work with other health and social care organisations and specialist groups to compare current practice with the recommendations. This may also help identify local issues that will slow or prevent implementation.

5. **Develop an action plan**, with the steps needed to put the guideline into practice, and make sure it is ready as soon as possible. Big, complex changes may take longer to implement, but some may be quick and easy to do. An action plan will help in both cases.

6. **For very big changes** include milestones and a business case, which will set out additional costs, savings and possible areas for disinvestment. A small project group could develop the action plan. The group might include the guideline champion, a senior organisational sponsor, staff involved in the associated services, finance and information professionals.

7. **Implement the action plan** with oversight from the lead and the project group. Big projects may also need project management support.

8. **Review and monitor** how well the guideline is being implemented through the project group. Share progress with those involved in making improvements, as well as relevant boards and local partners.

NICE provides a comprehensive programme of support and resources to maximise uptake and use of evidence and guidance. See our into practice pages for more information.

Also see Leng G, Moore V, Abraham S, editors (2014) Achieving high quality care – practical experience from NICE. Chichester: Wiley.

Context

The scope of this NICE guideline on diagnosing and managing chronic open angle glaucoma has been extended to cover referral. This includes the most effective service models for referral filtering schemes (repeat measures, enhanced case-finding and referral refinement), the tests to be used for finding people with chronic open angle glaucoma, suspected chronic open angle glaucoma and ocular hypertension (OHT), and thresholds for onward referral. We have also updated the guidance on tests for diagnosis and reassessment, pharmacological treatments for lowering intraocular pressure and preserving visual field, and reassessment intervals which depend on prognosis.

The update has provided an opportunity to re-evaluate the clinical effectiveness, cost effectiveness and indications for treating OHT. Knowledge of corneal thickness is no longer needed to decide whether or not to treat OHT and a single threshold of 24 mmHg is now recommended for both onward referral and treatment. Changes in the costs of pharmacological treatments, acknowledgement of short- and long-term variations in intraocular pressure and the uneven relationship between rising pressure and increased risk have allowed a simplification of the indications for OHT treatment.

Control of intraocular pressure remains critical to the therapeutic approach, with intensity of treatment and ongoing management being guided by disease severity and progression as shown by visual field change, morphological change in the optic disc, and the likelihood of progressive sight loss. Reassessment at each visit is emphasised, encouraging flexible clinical judgement about the frequency of visits and options for treatment, including stopping treatment when the perceived risk to a sighted lifetime is low.

Where fresh evidence was not found the guideline has not been updated, that is, accuracy of visual field tests, surgical interventions, laser procedures and information, education and support needed for adherence to treatment.

More information

You can also see this guideline in the NICE Pathway on glaucoma.

To find out what NICE has said on topics related to this guideline, see our web page on eye conditions.

See also the guideline committee's discussion and the evidence reviews (in the full guideline), and information about how the guideline was developed, including details of the committee.

Recommendations for research

The guideline committee has made the following recommendations for research.

1 Risk tools to identify risk of developing COAG and risk of sight loss

What is the predictive value of risk tools for identifying people in the community who are at increased risk of developing chronic open angle glaucoma (COAG) and identifying people with COAG who are at increased risk of sight loss?

Why this is important

Most cases of COAG are first detected by case-finding in community optometry after a sight test (with or without repeat measures, enhanced case-finding, or referral refinement). Identifying at case-finding which people are at high risk of conversion to COAG is important for guiding decisions about monitoring, treatment and referral. However, current evidence on the sensitivity and specificity of risk tools for developing COAG is of moderate-to-low quality, with all studies having a high or very high risk of bias. There was no evidence on cost effectiveness.

Similarly, a risk tool that identifies people with COAG who are at risk of progression to sight loss would be useful for both patients and healthcare professionals. People at higher risk of sight loss could have more frequent testing and perhaps more intensive treatment, whereas people at lower risk could have less frequent assessments and potentially less intensive treatment.

2 Treatment for people with an IOP of 22 or 23 mmHg

What is the clinical and cost effectiveness of treating an intraocular pressure (IOP) of 22 or 23 mmHg in people with normal optic discs and visual fields?

Why this is important

The only proven intervention for preventing and controlling glaucoma is lowering IOP. It has been widely accepted that the upper limit of statistically normal IOP is 21 mmHg. This was also accepted as the threshold for treatment, and most treatment studies aimed to achieve this target or a reduction in IOP of between 25% and 35% from baseline. However, more recently the Ocular Hypertension Treatment Study (OHTS) enrolled people with an IOP between 24 mmHg and

32 mmHg, but without glaucomatous optic nerve damage, to receive treatment or no treatment. The results showed a reduction in 5-year incidence of very early glaucoma (either optic disc or visual field changes) from 9.5% in people not receiving treatment to 4.4% in those having treatment. This leaves an area of uncertainty about treatment for people with an IOP above 21 mmHg but below 24 mmHg. There are about 1.8 million people in the UK with an IOP of 22 or 23 mmHg. The costs associated with management in these people are sufficient to make this question of national importance.

3 An instrument to measure quality of life in people with glaucoma

What instrument should be used to measure health related quality of life in people with glaucoma?

Why this is important

Quality of life is the most important overall measure of treatment effect for patients as it measures their life experience and how their life experience is affected by interventions. Patient-reported outcome measures (PROM) are used for informing patients of the value of interventions and may affect their treatment choices. They also offer a tool for audit or service evaluation of glaucoma services, and for designing glaucoma trials.

However, uncertainty exists as to which PROM instrument should be used to measure outcomes of glaucoma interventions. A suitable instrument would be helpful to inform patients, healthcare professionals and policy makers about the effectiveness of glaucoma interventions. Identifying a valid and responsive PROM for measuring glaucoma outcomes would allow this instrument to be adopted in future clinical trials and glaucoma audits and would ensure meaningful comparisons between different interventions.

4 Optical coherence tomography for glaucoma

What is the effectiveness and cost effectiveness of optical coherence tomography (OCT) for diagnosing and monitoring glaucoma?

Why this is important

Glaucoma is an age-related chronic condition and the second leading cause of blindness in the UK. Once detected, glaucoma care usually takes place in hospital eye services, where patients are monitored for the rest of their life. There are over 1 million visits per year for glaucoma care in the

NHS in England. This is predicted to increase substantially as a result of an ageing population and better detection in the community.

For diagnosis and monitoring, patients have an examination of the optic nerve and a review of visual field test results. Visual field testing has potential limitations: there is a learning effect and variability, it involves considerable patient effort, it is influenced by comorbidities, and in some people results are not reliable. Automated imaging with OCT overcomes many of these limitations.

OCT is an imaging technology that has evolved over the past 2 decades and is currently used in all NHS departments for the diagnosis and management of retinal diseases. However, current use of OCT and imaging technologies in glaucoma is highly variable.

It is possible the addition of OCT for diagnosing and monitoring glaucoma may enable earlier detection of disease and progression than when visual field testing is used alone. This could lead to escalation of treatment with less visual loss and blindness. However, it is possible that OCT may detect structural changes that will not be translated into functional loss, and may lead to unnecessary treatment. Overtreatment is likely to be associated with side effects and increased healthcare costs.

5 Referral filtering

What is the effectiveness and cost effectiveness of the different models for glaucoma filtering (pathways from case-finding to assessment in secondary ophthalmic care) for detecting glaucoma and glaucoma-related conditions (ocular hypertension and suspected glaucoma)?

Why this is important

Routine optometric sight testing has poor sensitivity and specificity for detecting glaucoma and glaucoma-related conditions, resulting in a high percentage of false positive referrals to secondary care. These are costly for commissioners, cause unnecessary anxiety for patients and are a burden for secondary care. A variety of referral filtering models have been developed to improve the accuracy of referrals. These include 'repeat measures' schemes in which IOP measurement or visual field assessments, or both, are repeated at a separate visit; 'enhanced case-finding' referral enhancement schemes in which IOP measurements are repeated, detailed disc assessment is carried out and visual fields are performed with automated perimetry; 'referral refinement' schemes, which require tests sufficient for the diagnosis of ocular hypertension and suspected COAG, including gonioscopy, and the interpretation of these clinical findings.

Each scheme requires different levels of healthcare training and qualifications. Investment in equipment may also be needed to set up these services, and professionals would expect remuneration for providing these models of care.

It is unclear which of these models is the most accurate (sensitive and specific) and which is most cost effective. Evidence is therefore needed so that commissioners can commission the best services that allow accurate referral to secondary care for glaucoma assessment.

Update information

November 2017: This guideline is an update of NICE guideline CG85 (published April 2009) and replaces it.

New recommendations have been added for case-finding, diagnosis, reassessment and treatment.

These are marked as: [2017].

Recommendations that have been changed

Amended recommendation wording (change to meaning)

Recommendation in 2009 guideline	Recommendation in current guideline	Reason for change
Obtain an optic nerve head image at diagnosis for baseline documentation. (1.1.4)	Obtain an optic nerve head image at diagnosis for baseline documentation (for example, a stereoscopic optic nerve head image or OCT). (1.2.4)	Clarification added that this image may be acquired by a stereoscopic optic nerve head image (leaving it open to either biomicroscopy slit lamp examination or stereo photography) or OCT, whichever is more readily available at the time of diagnosis.

Offer standard automated perimetry (central thresholding test) to all people who have established COAG and those suspected of having visual field defects who are being investigated for possible COAG. People with diagnosed OHT and those suspected of having COAG whose visual fields have previously been documented by standard automated perimetry as being normal may be monitored using supra-threshold perimetry (see tables 4 and 5 for recommended monitoring intervals). (1.2.5)	When clinically indicated, repeat visual field testing using standard automated perimetry (central thresholding test) for people with COAG and those suspected of having visual field defects who are being investigated for possible COAG (see tables 2 and 3 for recommended reassessment intervals). (1.4.3)	The original recommendation contained 2 separate instructions (1 for people with established COAG and those having initial investigation for possible COAG, and 1 for follow-up of people with an established diagnosis of suspected COAG or OHT). These 2 instructions have now been separated into 2 recommendations to improve clarity.

Offer standard automated perimetry (central thresholding test) to all people who have established COAG and those suspected of having visual field defects who are being investigated for possible COAG. People with diagnosed OHT and those suspected of having COAG whose visual fields have previously been documented by standard automated perimetry as being normal may be monitored using supra-threshold perimetry (see tables 4 and 5 for recommended monitoring intervals). (1.2.5)	When clinically indicated, repeat visual field testing using either a central thresholding test or a supra-threshold test for people with OHT and those suspected of having COAG whose visual fields have previously been documented by standard automated perimetry as being normal (see tables 1 and 2 for recommended reassessment intervals). (1.4.4)	As above, the original recommendation contained 2 separate instructions (1 for people with established COAG and those having initial investigation for possible COAG, and 1 for follow-up of people with an established diagnosis of suspected COAG or OHT). These 2 instructions have now been separated into 2 recommendations to improve clarity. The original recommendation was suggesting that for people with OHT and COAG suspects with normal visual fields, it would be acceptable to use the supra-threshold test as opposed to the superior central thresholding test (CTT) recommended for those with established COAG. However the committee wished to clarify that the CTT is also an option for this population if it is clinically available.

Offer alternative pharmacological treatment (a prostaglandin analogue, beta-blocker, carbonic anhydrase inhibitor or sympathomimetic) to treated people with OHT or suspected COAG whose IOP cannot be reduced sufficiently to prevent the risk of progression to sight loss. More than one agent may be needed concurrently to achieve target IOP. (1.3.5)	Offer a drug from another therapeutic class (beta-blocker, carbonic anhydrase inhibitor or sympathomimetic) to people with an IOP of 24 mmHg or more whose current treatment is not reducing IOP sufficiently to prevent the risk of progression to sight loss. Topical drugs from different therapeutic classes may be needed at the same time to control IOP. (1.5.6)	Clarification that the drug should be from another therapeutic class when switching to another monotherapy and when adding another drug. This clarification was considered important because committee members were aware of inappropriate switching through multiple examples of drugs from the same class (for example, multiple PGA switches).
Offer a preservative-free preparation to people with OHT or suspected COAG and an allergy to preservatives only if they are at high risk of conversion to COAG (IOP more than 25 and up to 32 mmHg and CCT less than 555 micrometres, or IOP more than 32 mmHg). (1.3.7)	Offer preservative-free eye drops to people who have an allergy to preservatives or people with clinically significant and symptomatic ocular surface disease, but only if they are at high risk of conversion to COAG. (1.5.8)	High risk of conversion is no longer defined in the guideline by IOP and CCT so these parameters have been removed from the recommendation. Treatment adherence may be significantly affected by both allergic and non-allergic reactions (preservative toxicity). Preservative toxicity is a particular problem for people with ocular surface diseases so this group was added to the recommendation.

Offer people with advanced COAG surgery with pharmacological augmentation (MMC or 5-FU) as indicated. Offer them information on the risks and benefits associated with surgery. (1.4.3)	Offer people with advanced COAG, surgery with pharmacological augmentation (MMC) as indicated. Offer them information on the risks and benefits associated with surgery. (1.5.13)	5FU is no longer used as standard practice during surgical treatment and postoperative care.
Offer people who present with advanced COAG and who are listed for surgery interim treatment with a prostaglandin analogue. (1.4.4)	Offer people who present with advanced COAG and who are listed for surgery, interim treatment with a PGA prescribed generically. (1.5.14)	Generic PGAs are now recommended in the guideline for first-line treatment.

Check the person's adherence to their treatment and eye drop instillation technique in people with COAG whose IOP has not been reduced sufficiently to prevent the risk of progression to sight loss despite pharmacological treatment. If adherence and eye drop instillation technique are satisfactory offer one of the following: • alternative pharmacological treatment (a prostaglandin analogue, beta-blocker, carbonic anhydrase inhibitor or sympathomimetic); more than one agent may be needed concurrently to achieve target IOP • laser trabeculoplasty • surgery with pharmacological augmentation (MMC or 5-FU) as indicated. If the pharmacological treatment option is chosen, after trying two alternative pharmacological treatments consider offering surgery with pharmacological augmentation (MMC or 5-FU) as indicated or laser trabeculoplasty. (1.4.6)	Ask about adherence to treatment and check the eye drop instillation technique in people with COAG whose IOP has not been reduced sufficiently to prevent the risk of progression to sight loss despite pharmacological treatment. If adherence and eye drop instillation technique are satisfactory offer 1 of the following: • a drug from another therapeutic class (a beta-blocker, carbonic anhydrase inhibitor or sympathomimetic); topical drugs from different therapeutic classes may be needed at the same time to control IOP • laser trabeculoplasty • surgery with pharmacological augmentation (MMC) as indicated. If the drug treatment option is chosen, after trying drugs from 2 therapeutic classes, consider offering surgery with pharmacological augmentation (MMC) as	Clarification that the drug should be from another therapeutic class when switching to another monotherapy and when adding another drug. 5FU is no longer used as standard practice during surgical treatment and postoperative care.

	indicated or laser trabeculoplasty. (1.5.16)	
Offer surgery with pharmacological augmentation (MMC or 5-FU) as indicated to people with COAG who are at risk of progressing to sight loss despite treatment. Offer them information on the risks and benefits associated with surgery. (1.4.7)	Offer surgery with pharmacological augmentation (MMC) as indicated to people with COAG who are at risk of progressing to sight loss despite treatment. Offer them information on the risks and benefits associated with surgery. (1.5.17)	5FU is no longer used as standard practice during surgical treatment and postoperative care.

Consider offering people with COAG who are intolerant to a prescribed medication: • alternative pharmacological treatment (a prostaglandin analogue, beta-blocker, carbonic anhydrase inhibitor or sympathomimetic) or • a preservative-free preparation if there is evidence that the person is allergic to the preservative. After trying two alternative pharmacological treatments consider offering surgery with pharmacological augmentation (MMC or 5-FU) as indicated or laser trabeculoplasty. (1.4.8)	Consider offering people with COAG who cannot tolerate a treatment: • a drug from another therapeutic class (a beta-blocker, carbonic anhydrase inhibitor or sympathomimetic) or • preservative-free eye drops if there is evidence that the person is allergic to the preservative or has clinically significant and symptomatic ocular surface disease After trying drugs from 2 therapeutic classes, consider offering surgery with pharmacological augmentation (MMC) as indicated or laser trabeculoplasty. (1.5.18)	Clarification that the drug should be from another therapeutic class when switching to another monotherapy. Treatment adherence may be significantly affected by both allergic and non-allergic reactions (preservative toxicity). Preservative toxicity is a particular problem for people with ocular surface diseases so this group was added to the recommendation. 5FU is no longer used as standard practice during surgical treatment and postoperative care.

After surgery offer people with COAG whose IOP has not been reduced sufficiently to prevent the risk of progression to sight loss one of the following: • pharmacological treatment (a prostaglandin analogue, beta-blocker, carbonic anhydrase inhibitor or sympathomimetic); more than one agent may be needed concurrently to achieve target IOP • further surgery • laser trabeculoplasty or cyclodiode laser treatment. (1.4.9)	After surgery offer people with COAG whose IOP has not been reduced sufficiently to prevent the risk of progression to sight loss 1 of the following: • pharmacological treatment; topical drugs from different therapeutic classes may be needed at the same time to control IOP • further surgery • laser trabeculoplasty or cyclodiode laser treatment. (1.5.19)	Clarification that the drug should be from another therapeutic class when switching to another monotherapy and when adding another drug.
Offer people with COAG who prefer not to have surgery or who are not suitable for surgery: • pharmacological treatment (a prostaglandin analogue, beta-blocker, carbonic anhydrase inhibitor or sympathomimetic); more than one agent may be needed concurrently to achieve target IOP • laser trabeculoplasty or cyclodiode laser treatment. (1.4.10)	Offer people with COAG who prefer not to have surgery or for whom surgery is not suitable: • pharmacological treatment; topical drugs from different therapeutic classes may be needed at the same time to control IOP • laser trabeculoplasty or cyclodiode laser treatment. (1.5.20)	Clarification that the drug should be from another therapeutic class when switching to another monotherapy and when adding another drug.

Offer people the opportunity to discuss their diagnosis, prognosis and treatment, and provide them with relevant information in an accessible format at initial and subsequent visits. This may include information on the following: • their specific condition (OHT, suspected COAG and COAG), its life-long implications and their prognosis for retention of sight • that COAG in the early stages and OHT and suspected COAG are symptomless • that most people treated for COAG will not go blind • that once lost, sight cannot be recovered • that glaucoma can run in families and that family members may wish to be tested for the disease • the importance of the person's role in their own treatment – for example, the ongoing regular application of eye drops to preserve sight • the different types of treatment options, including mode of action, frequency and severity of side effects, and risks and benefits of treatment, so that people are able to be active in the decision-making process	Offer people the opportunity to discuss their diagnosis, referral, prognosis, treatment and discharge, and provide them with relevant information in an accessible format at initial and subsequent visits. This may include information on the following: • their specific condition (OHT, suspected COAG and COAG), its life-long implications and their prognosis for retention of sight • that COAG in the early stages and OHT and suspected COAG are symptomless • that most people having treatment for COAG will have good quality of life and not go blind • that once lost, sight cannot be recovered • that glaucoma can run in families and that family members may wish to be tested for the condition	Amended to indicate that people should have the opportunity to discuss referral, and discharge, and that patient information should also include: • reassurance that most people having treatment for COAG will have a good quality of life • reference to the eye clinic liaison officer (ECLO) as these now available in many clinics • reference to support organisations.

• how to apply eye drops, including technique (punctal occlusion and devices) and hygiene (storage) • the need for regular monitoring as specified by the healthcare professional • methods of investigation during assessment • how long each appointment is likely to take and whether the person will need any help to attend (for example, driving soon after pupil dilatation would be inadvisable) • support groups • compliance aids (such as dispensers) available from their GP or community pharmacist • Letter of Vision Impairment (LVI), Referral of Vision Impairment (RVI) and Certificate of Vision Impairment (CVI) registration • Driver and Vehicle Licensing Agency (DVLA) regulations. (1.6.1)	• the importance of the person's role in their own treatment – for example, the ongoing regular application of eye drops to preserve sight • the different types of treatment options, including mode of action, frequency and severity of side effects, and risks and benefits of treatment, so that people are able to take an active part in decision-making • how to apply eye drops, including technique (punctal occlusion and devices) and hygiene (storage) • the need for regular monitoring as specified by the healthcare professional • methods of investigation during assessment	

	• how long each appointment is likely to take and whether the person will need any help to attend (for example, driving soon after pupil dilatation would be inadvisable) • the eye clinic liaison officer (ECLO) • support organisations and support groups • compliance aids (such as dispensers) available from their GP or community pharmacist • Letter of Vision Impairment (LVI), Referral of Vision Impairment (RVI) and Certificate of Vision Impairment (CVI), registration • Driver and Vehicle Licensing Agency (DVLA) regulations. (1.7.1)	

ISBN: 978-1-4731-2713-5

Accreditation

THE COLLEGE OF OPTOMETRISTS

Programme to prepare optometrists to diagnose OHT and COAG and to monitor patients with diagnosed OHT (on treatment or in the absence of a management plan) (Higher Certificate Level)

1. Aim

The training programme is designed to prepare optometrists to participate in community or hospital-based schemes involving the diagnosis of OHT and preliminary diagnosis of COAG (when not working under the supervision of a consultant ophthalmologist). The programme further develops skills in detecting change in clinical status and decision-making in patients at risk of developing glaucoma.

Optometrists working at this level should possess all of the competencies required at Certificate Level.

2. Learning outcomes

Following completion of the programme, an optometrist should demonstrate:

[a] an ability to perform a gonioscopic examination of the anterior chamber angle and to identify anatomical structures, accurately grade the angle width and interpret the significance of clinical findings.

[b] an ability to diagnose OHT or COAG through an integration of clinical observations/results of clinical investigations

[c] an ability to make appropriate management decisions in a patient with OHT

[d] an ability to monitor the response to treatment in a patient with OHT and modify the management plan or refer if necessary

[e] an awareness of the contraindications of anti-glaucoma medications and an ability to detect and manage drug-induced side effects

[f] an ability to inform patients of the rationale for monitoring their condition and an ability to explain the risk of developing glaucoma

[g] an ability to counsel patients regarding the risk of blindness associated with glaucoma, risk to family members, and potential impact of the disease on lifestyle

3. Indicative content

(a) Gonioscopy

- Technique
- Description of angle and interpretation of results
- Infection control

(b) Ocular hypertension (OHT)

- Definition
- Risk factors for conversion to COAG

(c) Tonometry

- Indications and interpretation of phasing

(d) Clinical decision making in the diagnosis of OHT and COAG

- Interpretation and synthesis of clinical findings
- Formulation of a clinical management plan
- Clinical guidelines e.g. NICE, EGS

(e) Anti-glaucoma medication

- Contraindications
- Side effects

(f) Imaging technologies in the monitoring of patients at risk of glaucoma

- HRT
- OCT
- GDx

(g) Lifestyle and social aspects of glaucoma

- Compliance
- Optimising quality of life
- Sources of help and information

(h) Clinical governance in the diagnosis of OHT/COAG

4. Teaching, Learning and Assessment Strategies

The programme should be of sufficient length to achieve the stated learning outcomes. Programme delivery may be achieved through a variety of learning strategies e.g. face-to-face instruction, distance learning or directed private study. However, these must be appropriate for the material or skill being taught Training should also incorporate a structured clinical placement in an appropriate ophthalmic care setting under the direction of a sub-specialist ophthalmologist mentor (although it is anticipated that specialist optometrists could be involved in the training process). The designated mentor will provide supervision and support, and will arrange for appropriate clinical exposure to facilitate the stated learning outcomes and the integration of theory and practice. During the placement, the trainee should have an active involvement in each patient episode. It is anticipated that the complexity of the case mix should gradually increase as clinical experience develops. From experience of existing training programmes for optometrists with a specialist interest in glaucoma, it is recognized that the number of patient episodes required to achieve competence varies considerably. However, at least 150 patient episodes of varying diagnosis and complexity are required for an individual to become competent at higher certificate level. As a guide, placements are likely to need to be of approximately 6 months duration on a one session per week basis in order to achieve the necessary experience, case exposure and patient numbers.

Trainees should maintain a portfolio that documents their clinical experience and competency-based assessments. The clinical placement could be augmented by case-based discussion and directed private study.

Assessment strategies must be made explicit and be appropriate for the competency they are designed to test. For example, competencies relating to a practical skill should be assessed using a skills-based assessment. The repeatability of clinical measurements e.g. GAT, could be assessed using an appropriate statistical technique e.g. Bland-Altman difference plots. The development of clinical decision making is a key aspect of the training and this should be formally assessed e.g. using a structured oral exam based on unseen clinical scenarios or a 'key features' examination. For each assessment, a marking scheme with the appropriate pass/fail criteria should be established.

Accreditation of prior learning (APL)

Accreditation of prior learning (APL) may be awarded to candidates as appropriate. It should be noted that the APL must be specific to the units and certificates already held by candidates. APL can count for no more than one third of the programme.

Candidates may be eligible for exemption from the clinical placement through accreditation of prior learning. The criteria for exemption are:

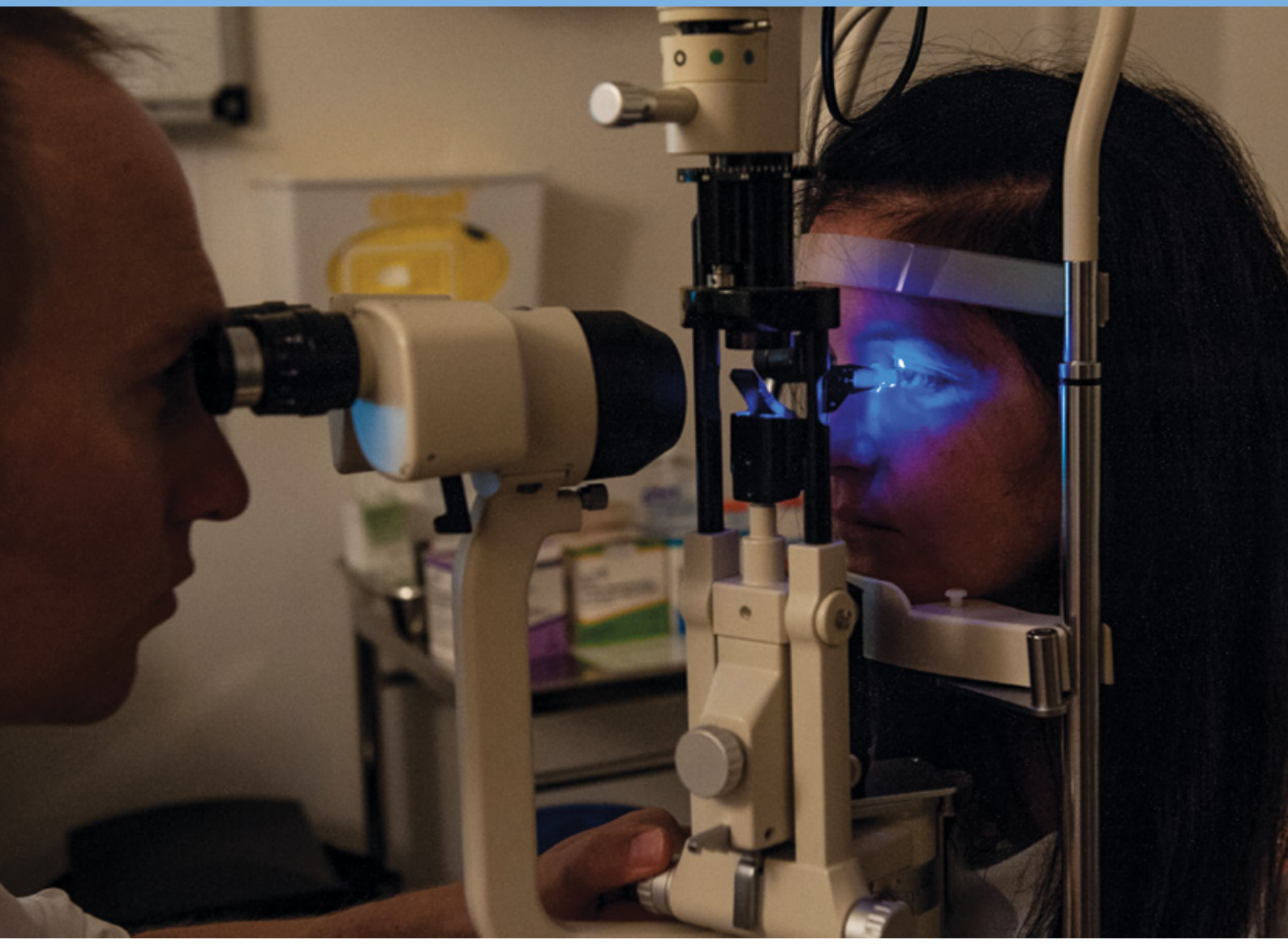
1. candidates must be current practitioners with relevant experience in glaucoma management within a hospital, clinic or other appropriate setting
2. candidates must present a portfolio of at least 150 patient episodes; patients should be seen within a hospital, clinic or other appropriate setting
3. the portfolio evidence must include details of relevant, specific workplace assessments which directly match the clinical skills learning outcomes in the College of Optometrists' Glaucoma professional higher certificate
4. items of evidence within a portfolio have a currency of two years.

The course provider must ensure that this portfolio is assessed by at least two assessors, using a formal process which is explicit, reliable, and valid and fits into the quality assurance framework of their course.

The Common Clinical Competency Framework for Non-medical Ophthalmic Healthcare Professionals in Secondary Care

Glaucoma

November 2016



The ROYAL COLLEGE of OPHTHALMOLOGISTS

Royal College of Nursing
Shaping nursing since 1916

BIOS
British and Irish Orthoptic Society

THE COLLEGE OF OPTOMETRISTS

AHPO
Association of Health Professions in Ophthalmology

General basic competences of non-medical eye health care professionals

The basic skill set of an ophthalmic non-medical health care professional (qualified optometrist, orthoptist, ophthalmic nurse or ophthalmic healthcare science practitioner) is to:

- Perform basic clinical ophthalmic assessment
- Follow protocols within their scope of practice under appropriate supervision
- Detect abnormalities through assessment and act on these findings
- Not make a diagnosis or treat

This level of skills and competences is essential before undertaking further training and education for a Level 1 expanded role; and some HCPs may need additional ophthalmic training (basic ophthalmic training courses) to obtain these skills.

Possession of a competence indicates demonstration of an understanding of the underlying principles, limitations and benefits of the skill, as well as being able to elicit the appropriate information accurately.

HISTORY TAKING

- Basic science knowledge about symptomatology of eye disease
- Communication skills – ability to elicit relevant information
- Clinical knowledge about ophthalmic presentations
- Ability to take a general ophthalmic history
- Ability to take a social, family and drug history
- Ability to take a relevant systemic history, including past medical history

OPHTHALMIC EXAMINATION

- Ophthalmic basic science knowledge
  - Anatomy
  - Physiology
  - Pathology
  - Optics
  - Microbiology
- Understanding of basic disease processes
- Ability to elicit and recognise the relevance of positive and negative findings on examination
- Visual acuity measurement – understanding of various methods and notations
- External ocular examination
- Slit lamp examination
- Fundal examination
- Pupil reactions
- Eye movements
- Clinical assessment of visual fields
- Understand management of refractive error

INVESTIGATIONS

- Recognise roles of various investigations and understand their basis

DEALING WITH THE NEEDS OF OPHTHALMIC PATIENTS

- Understand the terminology and notation used for ophthalmic examinations – including refractive status
- Communication skills
  - patients, relatives and colleagues
  - written, oral and non verbal
- Time management skills
- Patient as the focus of care
- Patient safety
- Infection control including equipment decontamination
- Knowledge of and adherence to local policies
- Team working
- Epidemiology of ophthalmic disease
- Understand basic drug principles
- Instil drops
- Administer drugs as prescribed
- Recognise allergies and common complications

TEACHING AND EDUCATION

- Recognise own development needs
- Ability to share basic information with patients for their education and understanding

PERSONAL DEVELOPMENT

- Self-learning
- Reflective practice
- Recognise and develop evidence based practice
- Recognise limitations of own practice and competences and works within this scope
- CPD – identify channels through which skills can be maintained and developed

Competence in practice – Glaucoma

Relevant underlying knowledge in competence and behavioural skills.

Level 1	Level 2	Level 3
Monitor patients with OHT or suspected COAG who have an established diagnosis and management plan (unplanned treatment changes not permitted).	Diagnosis of OHT or suspected COAG and establishment of a management plan. Preliminary identification of COAG for referral. Management of patients with OHT and suspected COAG (includes initiation, changes to and cessations of treatments, and alterations to the management plan).	Monitoring and management of people with established COAG which has been made by a consultant ophthalmologist. Patients may be managed directly or within co-management schemes.

Ophthalmic history taking

Level 1	Level 2	Level 3
As per general competences Ability to: • Demonstrate basic science knowledge regarding glaucoma aetiology and symptomatology • Demonstrate good communication skills • Take a history of any relevant clinical knowledge about glaucoma and other relevant conditions • Confirm a comprehensive history relevant for glaucoma/ OHT • Elicit details of risk factors	**As per Level 1** Ability to: • Take a specific comprehensive ophthalmic history in a patient with diagnosed or suspected glaucoma • Elicit ocular and systemic risk factors	**As per Level 2** Ability to: • Elicit a history relevant to the management of the patient with COAG, ie looking for change, concordance with treatment

Ophthalmic examination

Level 1	Level 2	Level 3
As per general competences Ability to: • Demonstrate basic science knowledge regarding appropriate examination techniques and findings for glaucoma patients • Demonstrate understanding of basic ophthalmic and general disease processes regarding glaucoma • Carry out an appropriate examination of the anterior segment and to interpret relevant signs • Accurately measure intraocular pressure using a slit-lamp mounted Goldmann applanation tonometer and the ability to analyse and interpret the results, avoiding potential errors • Undertake pachymetry for estimation central corneal thickness, and understand significance of the results • Assess anterior chamber depth by Van Herick to interpret relevant clinical signs • Assess optic nerve head by indirect bio microscopy at the slit lamp microscope, recognising the features of glaucomatous optic neuropathy • Recognise the signs and symptoms of angle closure glaucoma (or at risk of angle closure) – and refer accordingly	**As per level 1** Ability to: • Perform a gonioscopic examination of the anterior chamber angle and to identify anatomical structures, accurately grade the angle width and interpret the significance of clinical findings • Assess the optic nerve head by binocular indirect ophthalmoscopy and to detect the characteristic features of glaucomatous optic neuropathy • Demonstrate detailed understanding of disease processes regarding common eye conditions and relationships of other pathology to glaucoma • Assess anterior segment for common glaucoma associations • Diagnose OHT/preliminarily identify COAG by integrating all information from examinations performed • Recognise causes of raised IOP, eg topical steroids	**As per Level 2** Ability to: • Demonstrate detection of progression by noting change in optic nerve head clinically • Recognise complex anterior segment anomalies of relevance to those with glaucoma eg - Secondary glaucoma's - Post-surgical changes

Investigations

Level 1	Level 2	Level 3
As per general competences Ability to: • Show an awareness of roles of investigations used to diagnose and monitor glaucoma • Evaluate perimetry for glaucomatous loss, understanding appropriate test strategies and recognising error, artefact and non-glaucomatous visual field loss	**As per Level 1** Ability to: • Demonstrate an understanding of the use of perimetric techniques for the assessment of a patient with suspected glaucoma, including test strategies used, limitations, sources of error, interpretation of results and the recognition of glaucomatous field loss • Understand the imaging techniques used to assess the optic nerve head and retinal nerve fibre layer and the ability to interpret the results of such investigations	**As per Level 2** Ability to: • Detect a change in clinical status (eg visual field status, intraocular pressure, assessment of anterior or posterior segments) • Understand perimetry results relevant to COAG, different strategies used and ability to identify progression of visual field loss • Detect progression by noting change in optic nerve head and ganglion cell layer by imaging techniques

Management and interventions

Level 1	Level 2	Level 3
As per general competences Ability to: • Make clinical decisions relevant ie identify those requiring referral or those with OHT/suspected COAG demonstrating change and referring to a glaucoma clinic • Understand the role of guidelines and protocols, but also the limitations of these	**As per Level 1** Ability to: • Make appropriate management and treatment decisions/alter management plan in OHT • Recognise differential diagnoses from other ocular and central visual anomalies • Understand the risk factors for conversion to glaucoma and the ability to detect change in optic nerve parameters. • Assess response to treatment	**As per Level 2** Ability to: • Integrate relevant information on visual field (change), optic nerve head (change) and control of IOP and to respond in a safe and clinically appropriate manner • Monitor the response to treatment and modify the management plan, if necessary • Understand time frames for follow-up of patients taking into account local preferences, risk of progression, and patient-related factors (age, concurrent disease, etc.)

Management and interventions continued		
		• Demonstrate knowledge of the pharmacology, cautions, contraindications, interactions and side effects of medication to treat ocular hypertension and glaucoma • Demonstrate knowledge of the indications for techniques, expected outcomes and complications of laser therapies and surgical interventions used in the management of glaucoma and its related conditions • Demonstrate an understanding of indications for and techniques of laser and surgical intervention for glaucoma, including expected outcomes and complications • Understand NICE guidelines regarding management and follow up intervals • Perform SLT and laser PIs

Ability to deal with needs of ophthalmic patients

Level 1	Level 2	Level 3
As per general competences Ability to: • Demonstrate awareness of the patient as the focus of care • Demonstrate team working and communication • Demonstrate an understanding of concept of risk and review timescales for OHT/suspected COAG • Recognise one's own limitations and the need to consult with more experience colleagues	**As per Level 1** Ability to: • Deal with uncertainty • Maintain clear, accurate and contemporaneous clinical records of history, examination and results of clinical investigations in patients with OHT, at risk of or with suspected glaucoma • Recognise the signs and symptoms of a patient suffering from angle-closure glaucoma (or at risk of angle closure) and to refer the patient accordingly (including the instigation of emergency treatment, if necessary)	**As per Level 2** Ability to: • Understand and develop patient pathways • Contribute to service development • Demonstrate understanding of pharmacology of glaucoma medications, contra-indications, side effects and drug interactions • Prescribe medications independently subject to an independent prescribing qualification

Ability to deal with needs of ophthalmic patients continued		
• Work within local protocols for glaucoma detection • Inform/educate patients/ public re glaucoma detection, prognosis (including risks to driving and of blindness) and management • Recognise and communicate risks to family members • Maintain clear and accurate clinical records of patient at risk or with suspected glaucoma • Understand glaucoma medication principles • Demonstrate how to instil drugs as prescribed • Understand the importance of compliance and can initiate appropriate counselling • Demonstrate awareness of regular feedback and discussion with ophthalmologist	• Understand treatment options and when they may be appropriate • Understand the risk factors for conversion to glaucoma and the relevant NICE guidelines for treatment or observation • Make clinical decisions based on the needs of the patient • Demonstrate awareness of the timescales for follow-up of patients with OHT and suspected COAG • Help patients make informed choices within the limits of the patient's and practitioner's understanding after their diagnosis • Demonstrate awareness of action of glaucoma medications, contra-indications and identification and management of side-effects • Initiate appropriate treatment in conjunction with the ophthalmologist, local policies and procedures and Patient Group Directions where appropriate • Prescribe medications independently subject to an independent prescribing qualification	

Teaching and education

Level 1	Level 2	Level 3
As per general competences Ability to: • Learn and develop • Recognise own development needs	**As per Level 1** Ability to: • Demonstrate and share skills • Counsel patients regarding risks of blindness associated with glaucoma, risk to family members, and potential impact of the disease on lifestyle (including driving) and the ability to provide information on available sources of help, counselling and support. • Inform/educate patients on the reasoning behind a monitoring plan	**As per Level 2** Ability to: • Help patients make informed choices about their management and to check their understanding of and commitment to their management and follow-up • Inform patients about various treatment options - including indications and risks to help them make informed choices • Teach and train including other groups of professions

Personal Development

Level 1	Level 2	Level 3
As per general competences Ability to: • Direct self-learning • Understand reflective practice • Demonstrate awareness of own limitations and consult a more experienced colleague • Demonstrate participation in CPD	**As per Level 1**	**As per Level 2** Ability to: • Operate within local protocols for the detection and/or management of glaucoma

GLAUCOMA COMMON COMPETENCY FRAMEWORK

- This framework covers the knowledge and skills required for the diagnosis of OHT suspected open angle glaucoma. It also covers competences required for monitoring and managing 'low risk' to 'moderate risk' patients with OHT and diagnosed glaucoma. In this context, monitoring involves the process of following a patient's condition through time to detect changes in clinical or disease status which may require action, management involves reviewing treatment in response to changes in a patient's clinical or disease status.
- The glaucoma common competency framework assumes that a number of key generic skills have already been evidenced eg communication skills, team-working, history taking, slit lamp examination and non-contact binocular indirect ophthalmoscopy.
- The framework applies only to adult-onset glaucoma and does not apply to paediatric and juvenile glaucoma.

The National Institute for Health and Clinical Excellence (NICE) guideline CG85 on the diagnosis and management of chronic open angle glaucoma (COAG) and ocular hypertension (OHT) made recommendations regarding the involvement of non-medical healthcare professionals (HCPs) in the diagnosis and management of these conditions. Although CG85 recommends that all patients with suspected glaucomatous damage should be referred to a consultant ophthalmologist for consideration of a definitive diagnosis and formulation of a management plan, there was recognition that appropriately trained HCPs could diagnose OHT and suspected glaucoma and make a preliminary identification of cases of COAG. Furthermore, persons with a diagnosis of OHT, suspected COAG or COAG could also be monitored and managed under shared/delegated care arrangements within certain constraints.

The NICE glaucoma guideline stipulated that HCPs involved in the diagnosis, monitoring and management of glaucoma should have relevant experience and a specialist qualification in glaucoma when not working under the direct supervision of a consultant ophthalmologist. The guideline broadly defined the competences needed for HCPs to be involved in glaucoma service delivery. In 2010 a modified iterative Delphi technique was used in conjunction with a multidisciplinary panel to reach a consensus on the competences required by optometrists with a specialist interest in glaucoma. The resulting competency framework mapped directly onto the requirements outlined in the NICE glaucoma guideline and was used by the College of Optometrists (CoO) to develop a series of specialist professional qualifications in glaucoma to replace the previous CoO specialist glaucoma qualification; the 'Diploma in Glaucoma (DipGlauc)'. The new qualifications use a modular approach based on three levels:

- Professional Certificate
- Professional Higher Certificate which builds on the Certificate
- Professional Diploma which builds on the Higher Certificate

Abbreviations

AMD	Age Related Macular Degeneration
APD	Afferent Pupillary Defect
BRVO	Branch Retinal Vein Occlusion
CMO	Cystoid Macular Oedema
COAG	Chronic Open Angle Glaucoma
CPD	Continuing Professional Development
CRVO	Central Retinal Vein Occlusion
CSR	Central Serous Retinopathy
DM	Diabetes Mellitus
DMO	Diabetic Macular Oedema
DR	Diabetic Retinopathy
HCPs	Health Care Professionals
HEIs	Higher Education Institutions
HES	Hospital Eye Service
ICG	Indocyanine Green
IOP	Intra Ocular Pressure
IP	Independent Prescriber
LA/GA	Local Anaesthetic/General Anaesthetic
MR	Medical Retina
nAMD	Neovascular Age Related Macular Degeneration (wet AMD)
OCT	Optical Coherence Tomography
OHT	Ocular Hypertension
PGD	Patient Group Directive
PI	Peripheal Iridotomy
RVO	Retinal Vein Occlusion
SLT	Selective Laser Trabeculoplasty

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