

## Glaucoma overview

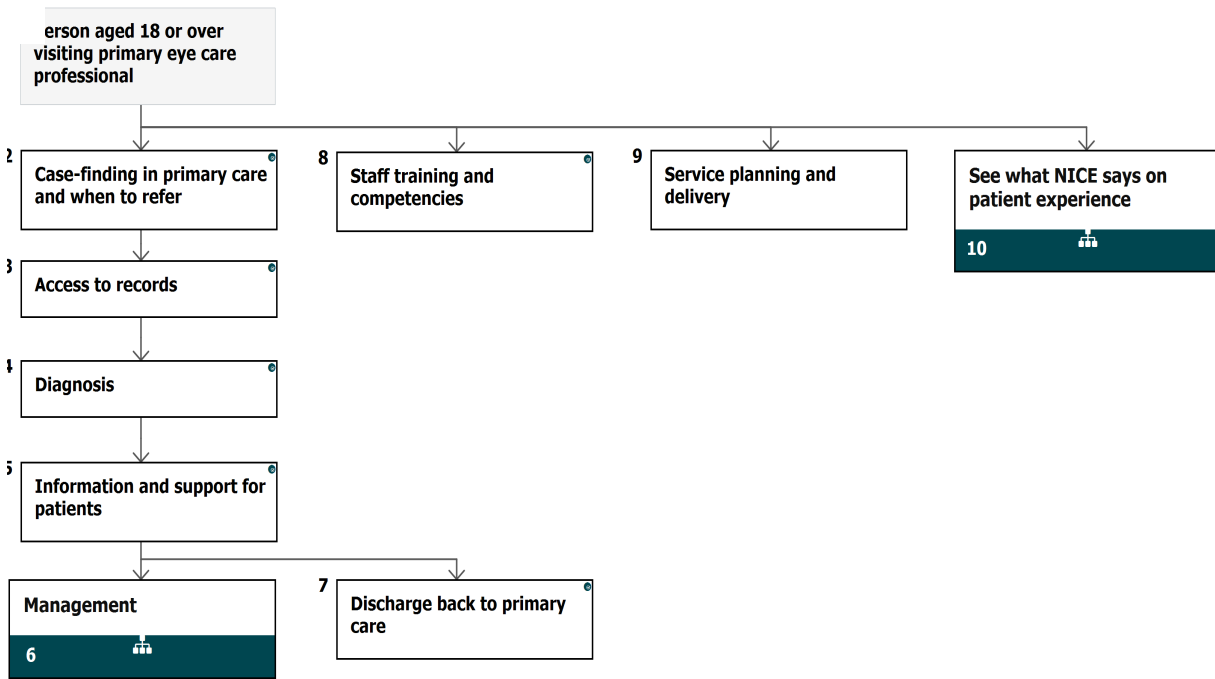
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NICE Pathways are interactive and designed to be used online. They are updated regularly as new NICE guidance is published. To view the latest version of this pathway see:

<http://pathways.nice.org.uk/pathways/glaucoma>

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This document contains a single pathway diagram and uses numbering to link the boxes to the associated recommendations.



## 1 Person aged 18 or over visiting primary eye care professional

No additional information

## 2 Case-finding in primary care and when to refer

### Case-finding in primary care

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 OCT or optic nerve head image if available
- 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.

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.

Advise people with IOP below 24 mmHg to continue regular visits to their primary eye care professional.

### When to refer

Refer for further investigation and diagnosis of COAG and related conditions, after considering repeat measures, 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.

Provide results of all examinations and tests with the referral.

Do not base a decision to refer solely on IOP measurement using non-contact tonometry.

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.

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.

## Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

1. Referral 1
2. Referral 2
3. Referral 3
4. Diagnosis and management plan

### 3 Access to records

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.

See NICE's recommendations on [maintaining and sharing drug allergy information](#) and [medicines optimisation](#).

## Quality standards

The following quality statement is relevant to this part of the interactive flowchart.

9. Documentation

## 4 Diagnosis

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

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
- CCT measurement.

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).

Obtain an optic nerve head image at diagnosis for baseline documentation (for example, a stereoscopic optic nerve head image or OCT).

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).

Ensure that all machines and measurement instruments are calibrated regularly according to the manufacturers' instructions.

Adopt [professional/Department of Health guidance](#) to reduce the risk of transmitting infective agents via contact tonometry or gonioscopy.

At the time of diagnosis of OHT, assess risk of future visual impairment, taking account of risk factors such as:

- level of IOP
- CCT
- family history
- life expectancy.

NICE has published medtech innovation briefings on:

- [Icare rebound tonometer to measure intraocular pressure](#)
- [SENSIMED Triggerfish contact lens sensor for continuous 24-hour recording of ocular dimensional changes in people with or at risk of developing glaucoma](#).

## Quality standards

The following quality statement is relevant to this part of the interactive flowchart.

### 3. Diagnosis

## 5 Information and support for patients

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 recommendations 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 ECLO
- support organisations and support groups
- compliance aids (such as dispensers) available from their GP or community pharmacist

- LVI, RVI and CVI registration
- DVLA regulations.

NICE has written information for the public on [glaucoma: diagnosis and management](#).

## Quality standards

The following quality statement is relevant to this part of the interactive flowchart.

11. Information

### 6 Management

[See Glaucoma / Managing glaucoma](#)

### 7 Discharge back to primary care

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.

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.

## Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

5. Monitoring

8. Service capacity

12. Discharge

## 8 Staff training and competencies

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.

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.

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 [See page 11] 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.

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.

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).

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.

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

## Quality standards

The following quality statements are relevant to this part of the interactive flowchart.

2. Referral 2
4. Diagnosis and management plan

## 9 Service planning and delivery

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.

People planning eye care services should consider commissioning [referral filtering services](#) [See page 11] (for example, repeat measures, enhanced case-finding, or referral refinement) for COAG and related conditions.

## 10 See what NICE says on patient experience

[See Patient experience in adult NHS services](#)

## Referral filtering services

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'.

- 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.
- 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.
- 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 (for example, repeat measurement of IOP only). 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 staff training and competencies. 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.
- 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.

Referral refinement is 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 (for example, repeat measurement of IOP only). 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 staff training and competencies. 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.

## **Glossary**

### **COAG and related conditions**

(include COAG, OHT and suspected COAG)

#### **5-FU**

5-fluorouracil

#### **ECLO**

eye clinic liaison officer

#### **CCT**

central corneal thickness

#### **COAG**

chronic open-angle glaucoma

#### **CVI**

certificate of vision impairment

#### **DVLA**

Driver and Vehicle Licensing Agency

#### **LVI**

letter of vision impairment

#### **IOP**

intraocular pressure

**MMC**

mitomycin C

**OCT**

optical coherence tomography

**OHT**

ocular hypertension

**PGA**

prostaglandin analogue

**Primary eye care professional**

(primary eye care professionals include optometrists, GPs with a special interest in ophthalmology and community orthoptists)

**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)

**RVI**

referral of vision impairment

**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 unaware of a problem; sight loss may progress to visual impairment and eventually become symptomatic)

## Sight tests

(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

(visual impairment is 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)

## Sources

[Glaucoma: diagnosis and management](#) (2009 updated 2017) NICE guideline NG81

## Your responsibility

The guidance in this pathway represents the view of NICE, which was arrived at after careful consideration of the evidence available. Those working in the NHS, local authorities, the wider public, voluntary and community sectors and the private sector should take it into account when carrying out their professional, managerial or voluntary duties. Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way which would be inconsistent with compliance with those duties.

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