
 National Institute for
 Health and Clinical Excellence


Glaucoma

Implementing NICE guidance

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NICE clinical guideline 85



Background

- Chronic open angle glaucoma (COAG) is a common and potentially blinding condition, and is usually asymptomatic until advanced
- Ocular hypertension (OHT) is a major risk factor for developing COAG
- Approximately 10% of UK blindness registrations are attributed to glaucoma
- By implementing this guideline more people will be prevented from going blind
- With changes in population demographics the number of individuals affected by glaucoma is expected to rise

Background

- Conscientious and regular monitoring according to the perceived threat to a patient's sighted lifetime is crucial to success [of glaucoma treatment]...
- Service pressures and targets to bring down waiting times for new referrals has displaced capacity away from chronic disease monitoring with consequent cancellations and long delays in follow up appointments.
- Such distortions of clinical practice, where a new referral for someone who may or may not have a significant eye problem gains priority over a patient with a diagnosed and potentially blinding eye disease has resulted in service failures for individuals and cannot be accepted.

Scope

The diagnosis and management of people with COAG and OHT in community, primary care, secondary care outpatient and day treatment services and tertiary care specialist services for people in the following groups:

- adults (18 and older) with a diagnosis of COAG or OHT
- people with chronic open angle glaucoma or ocular hypertension associated with pseudoexfoliation or pigment dispersion
- people who have a higher prevalence of glaucoma and may have worse clinical outcomes

What is a NICE guideline?

Our clinical guidelines are recommendations for the care of individuals in specific clinical conditions or circumstances within the NHS...

We base our clinical guidelines on the best available research evidence, with the aim of improving the quality of health care.

We use predetermined and systematic methods to identify and evaluate the evidence relating to specific clinical questions.

What is a guideline?

Clinical guidelines can:

- provide recommendations for the treatment and care of people by health professionals
- be used to develop standards to assess the clinical practice of individual health professionals
- be used in the education and training of health professionals
- help patients to make informed decisions
- improve communication between patient and health professional

What is a guideline?

- While guidelines assist the practice of healthcare professionals, they do not replace their knowledge and skills.
- 'One size' will never 'fit all'. Thus there will always be clinical exceptions and the intention of the guideline is to provide recommendations which will apply to 80% of clinical situations on 80% of occasions.

Diagnosis: COAG

In the great majority of cases, a definite diagnosis of COAG should only be made when there is an irrefutable and consistently demonstrable abnormality of visual function in at least one eye. Usually this will be defined by a relative or absolute scotoma in the field of vision demonstrated by standard automated perimetry (SAP).

This functional abnormality should be confidently attributed to glaucomatous optic neuropathy to the exclusion of any other cause and corroborated by demonstrable abnormality of the optic nerve in the affected eye(s).

Diagnosis: Suspected COAG / OHT

A person may be classified as **COAG suspect** when the optic nerve head appearance is suggestive of COAG but the visual fields appear normal, or conversely, where a visual field defect exists yet the optic nerve appears healthy (other causes of visual field defects having been excluded).

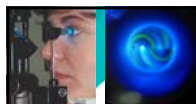
If the intraocular pressure is raised in the presence of suspicious optic nerve changes the person may be classified as **COAG suspect with ocular hypertension**.

Where both the visual field and the optic nerve appear normal in the presence of elevated pressure the person is classified as having '**simple**' **ocular hypertension**.

Diagnostic tests

At diagnosis offer all people who have COAG, who are suspected of having COAG or who have OHT all of the following tests:

- intraocular pressure (IOP) measurement using Goldmann applanation tonometry (slit lamp mounted)
- central corneal thickness (CCT) measurement
- peripheral anterior chamber configuration and depth assessments using gonioscopy
- visual field measurement using standard automated perimetry (central thresholding test)
- optic nerve assessment, with dilatation, using stereoscopic slit lamp biomicroscopy with fundus examination



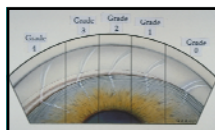
Questions on Diagnosis: IOP measurement

- Is non-contact tonometry suitable as an alternative to Goldmann Applanation Tonometry?
 - The GDG considered Goldmann applanation tonometry to be the reference standard for measurement of IOP. The available evidence suggests that non-contact tonometry could not accurately measure the higher IOP.
- Are disposable prisms suitable as an alternative to Goldmann prisms when using Goldmann Applanation Tonometry?
 - **Clinical:** No studies were identified comparing the diagnostic accuracy of disposable to Goldmann prisms. **Economic:** No studies were identified comparing the costs of disposable to Goldmann prisms.



Questions on Diagnosis: Central corneal thickness

- Central corneal thickness was identified as a risk factor of converting from OHT to POAG.
- A variety of options exist for measurement of central corneal thickness. There is no universally accepted reference standard. The GDG did not consider it necessary to investigate in detail comparisons between the various machines available.
- The GDG decided it was important to consider assessing CCT.



Questions on Diagnosis: Anterior chamber assessment

- [The GDG] searched for data comparing gonioscopy and the following non gonioscopic procedures: iris eclipse or shadow test, Van Herick's test, slit lamp assessment, Redmond-Smith slit lamp assessment, Scheimpflug anterior segment photography, ultrasound (A-scan), (Ultra)High resolution B-scan, Ultrasound BioMicroscopy (UBM) and anterior segment optical coherence tomography (OCT).
- The GDG considered gonioscopy to be the accepted reference standard assessment for establishing the configuration and condition of the peripheral anterior chamber and drainage angle. Use Van Herick's peripheral anterior chamber depth assessment test as an alternative to gonioscopy if clinical circumstances rule out gonioscopy.



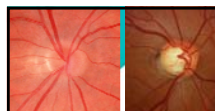
Questions on Diagnosis: Visual field measurement

- The GDG recommended testing using a threshold strategy, although this need not be machine specific. Where Humphrey Field Analyzers are used, the GDG consensus is that 24-2 SITA Standard is preferred.
- The GDG considered 24-2 SITA Humphrey tests as the reference standard in assessing visual field. We searched for data comparing 24-2 SITA Humphrey tests and the following alternative visual field tests: Henson, Dicon, Octopus, frequency doubling technology (FDT) and Humphrey tests other than 24-2 SITA. No studies were identified comparing the diagnostic accuracy of these tests against 24-2 SITA Humphrey.
- Patients may find a shorter, easier test from a different machine more comfortable but may prefer the longer Humphrey 24-2 SITA standard test in the knowledge that it is the most accurate.



Questions on Diagnosis: Optic nerve assessment

- The GDG considered that bio-microscopic slit lamp examination is the most important part of the assessment of optic nerve appearance.
- There was a lack of evidence investigating the diagnostic accuracy of other optic disc imaging techniques against the reference standard.
- There may be a role for [OCT, HRT and SLP] in detection of progressive change through sequential monitoring but evidence is as yet inadequate to support a recommendation in this regard.
- At diagnosis offer all people who have COAG, suspected COAG or OHT dilatation of their pupils before undergoing stereoscopic slit lamp biomicroscopy for fundus examination.



Questions on Diagnosis: Optic nerve imaging

Supporting recommendations: Obtain an optic nerve head image at diagnosis for baseline documentation.

- The GDG decided it is important to have an image of the optic disc from which to determine if there has been a change in its appearance. Without this image as a baseline reference a clinician may not make an accurate assessment of progression of optic nerve damage over time.
- Although stereophotography would be the imaging standard there are other imaging modalities which may also be used, in which case continuity with previous similar images should be available for purposes of comparison.

Diagnosis

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

Monitoring intervals for people with OHT/suspected COAG recommended to receive medication

Clinical assessment			Monitoring intervals (months)	
IOP at target ^a	Risk of conversion to COAG ^b	Outcome ^c	IOP alone ^d	IOP, optic nerve head and visual field
Yes	Low	No change in treatment plan	Not applicable	12 to 24
Yes	High	No change in treatment plan	Not applicable	6 to 12
No	Low	Review target IOP or change treatment plan	1 to 4	6 to 12
No	High	Review target IOP or change treatment plan	1 to 4	4 to 6

Monitoring intervals for people with COAG

	Clinical assessment		Monitoring intervals (months)	
	Progression ^a	Outcome ^a	IOP alone ^a	IOP, optic nerve head and visual field
Yes	No ^a	No change in treatment plan	Not applicable	6 to 12
Yes	Yes	Review target IOP and change treatment plan	1 to 4	2 to 6
Yes	Uncertain	No change in treatment plan	Not applicable	2 to 6
No	No ^a	Review target IOP or change treatment plan	1 to 4	6 to 12
No	Yes/uncertain	Change treatment plan	1 to 2	2 to 6 IOP at target ^b

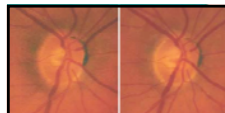
Monitoring: Investigations

- Offer Goldmann applanation tonometry (slit lamp mounted) to all people with COAG, who are suspected of having COAG or who have OHT at each monitoring assessment.
- Repeat CCT measurement as necessary (for example, following laser refractive surgery or at onset or progression of corneal pathology).
- Offer Van Herick's peripheral anterior chamber depth assessment to all people with COAG, who are suspected of having COAG or who have OHT at each monitoring assessment.
- Repeat gonioscopy when clinically indicated (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).

Monitoring: Investigations

- 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.
- Where a defect has previously been detected use the same visual field measurement strategy for each visual field test.
- People with diagnosed OHT and suspected COAG whose visual fields have previously been documented by standard automated perimetry as being normal may be monitored using supra-threshold perimetry.

Monitoring: Investigations



- Offer stereoscopic slit lamp biomicroscopic examination of the optic nerve head to all people with COAG, who are suspected of having COAG or who have OHT at monitoring assessments.
- When an adequate view of the optic nerve head and surrounding area is unavailable at a monitoring visit, people undergoing stereoscopic slit lamp biomicroscopy should have their pupils dilated before the assessment.
- When a change in optic nerve head status is detected by stereoscopic slit lamp biomicroscopic examination, obtain a new optic nerve head image for the person's records to provide a fresh benchmark for future assessments.

Organisation of care

- Over the past decade, increasing demand for care of patients with COAG, ocular hypertension and COAG suspect status has led to involvement of non-medical and non-ophthalmologist medical healthcare professionals in COAG care beyond traditional roles.
- In some locations, revised pathways now provide for parts of COAG-related patient care in non-HES locations. In the future it is possible that an increasing proportion of these patients will need to be managed by non-medical and non-ophthalmologist healthcare professionals to meet the burgeoning demands on COAG service provision.
- For the purposes of this guideline the term 'healthcare professional' refers to a trained individual involved in glaucoma related care including: ophthalmologists, optometrists, orthoptists, pharmacists, nurses and general practitioners.

Organisation of care

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

- The consequence of either failing to identify COAG or incorrect diagnosis may lead to irreversible blindness and visual disability.
- There are high costs associated with false negative and false positive diagnoses of COAG. It is important to obtain the most accurate diagnosis.

Organisation of care

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 (when not working under the supervision of a consultant ophthalmologist) and**
 - **relevant experience.**
- The clinical evidence was of variable quality due to the following limitations: studies were not carried out in a systematic and controlled way, and there was the potential for selection bias as some patients were volunteers.
 - The economic evidence has serious limitations because the only study identified was not a full economic evaluation, the cost of false negatives were not estimated and the capital cost of necessary equipment for accredited optometrists was not included.

Organisation of care

Healthcare professionals involved in the diagnosis of OHT, 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's peripheral anterior chamber depth assessment
- CCT measurement.

Organisation of care

People with a confirmed diagnosis of OHT or suspected COAG and who have an established management plan may be monitored (but not treated) by 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 to monitor people with OHT or COAG suspect status when they have normal visual field)
- stereoscopic slit lamp biomicroscopic examination of anterior segment
- Van Herick's peripheral anterior chamber depth assessment
- examination of the posterior segment using slit lamp binocular indirect ophthalmoscopy.

Organisation of care

Healthcare professionals involved in the monitoring and treatment of people with 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 vision loss
- monitoring and clinical status change detection (for example, visual field changes, stereoscopic slit lamp biomicroscopic examination of anterior segment and posterior segment)
- pharmacology of IOP-lowering medications
- treatment changes for COAG, COAG suspect status and OHT (with consideration given to relevant contraindications and interactions).

Organisation of care

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

Clinical governance applies to all NHS services. Although a consultant ophthalmologist may be responsible for the care of a patient they may delegate the task diagnosis, treatment and monitoring to another suitably trained healthcare professional under their supervision. When healthcare professionals provide care independently of consultant supervision they should practice within the limits of their competence. Patients should clearly understand who is responsible for their care.

Find out more

Visit www.nice.org.uk/CG85 for:

- the guideline
- the quick reference guide
- 'Understanding NICE guidance'
- costing report and template/costing statement
- audit support
- commissioning guide



Controversies

AOP, ABDO & FODO (but not the College of Optometrists) circulated statements to their ~10,500 members coincident with the publication of the guideline:

the guidelines are now in the public domain, optometrists put themselves at risk unless they comply; ...regardless of any suggested solutions made by your local primary care organization or local ophthalmologists to continue current practice, for legal defence purposes, it is strongly advised to refer all patients with intraocular pressure over 21mmHg to an ophthalmologist... If the resultant reading is over 21mmHg, regardless of the instrument, then the patient may be referred... This, of course, could overwhelm hospital eye service departments but our view is that optometrists and optical businesses put themselves at risk unless they comply with the guidelines.



Controversies

Response from John Sparrow, Chair of Guideline Development Group, "Opinion, The NICE Guideline", *Eye News Oct/Nov 2009*

The properly managed implementation period advised by NICE is three years (or five years in exceptional circumstances). Unfortunately these three optometric organisations have ignored both their own advice regarding phased implementation as well as that from NICE. Furthermore, the scope of the guideline is diagnosis and management, with screening and case finding specifically excluded, yet they have extracted information on diagnosis and implanted this into a case finding / screening environment. Nowhere does the guideline recommend the referral to an ophthalmologist of people who have normal optic nerves and fields on the basis of 'single occasion' IOP measurements above 21mmHg using non-standard measurement tools such as noncontact tonometry.

