Glaucoma: diagnosis and management of chronic open angle glaucoma and ocular hypertension

NICE guideline
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If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.
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Introduciton

Chronic open angle glaucoma (COAG) is characterised by gradual loss of sight in the presence of visual field loss and glaucomatous optic nerve damage. COAG is frequently accompanied by elevated eye pressure, in which case the term primary open angle glaucoma (POAG) is applied, or else normal pressure, in which case the condition may be termed normal tension glaucoma (NTG). Ocular hypertension (OHT) is elevated eye pressure in the absence of visual field loss or glaucomatous optic nerve damage, and represents a major risk for future development of COAG with visual damage. Both COAG and OHT may be associated with pseudoexfoliation or pigment dispersion. All these conditions tend to be asymptomatic and many people with COAG will not notice any symptoms until severe visual damage has occurred.

Approximately 10% of UK blindness registrations are ascribed to glaucoma and around 2% of people older than 40 years have COAG, rising to almost 10% in people older than 75 years. With changes in population demographics the number of individuals affected is expected to rise. Based on these estimates 480,000 people are currently affected by COAG in England and there are over a million glaucoma related outpatient visits in the hospital eye service annually. Once diagnosed, affected individuals require lifelong monitoring for disease control and for detection of possible progression of visual damage. Once lost, vision cannot be restored and disease control with prevention, or at least minimisation of ongoing damage, is crucial to maintenance of a sighted lifetime.

The guideline will assume that prescribers will use a drug's summary of product characteristics to inform their decisions for individual patients.
Patient-centred care

This guideline offers best practice advice on the diagnosis and management of chronic open angle glaucoma and ocular hypertension.

Treatment and care should take into account patients’ needs and preferences. People with ocular hypertension (OHT) or chronic open angle glaucoma (COAG) should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If patients do not have the capacity to make decisions, healthcare professionals should follow the Department of Health guidelines – ‘Reference guide to consent for examination or treatment’ (2001) (available from www.dh.gov.uk).

Healthcare professionals should also follow a code of practice that accompanies the Mental Capacity Act (summary available from www.publicguardian.gov.uk).

Good communication between healthcare professionals and patients is essential. It should be supported by evidence-based written information tailored to the patient’s needs. Treatment and care, and the information patients are given about it, should be culturally appropriate. It should also be accessible to people with additional needs such as physical, sensory or learning disabilities, and to people who do not speak or read English.

If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care.

Families and carers should also be given the information and support they need.
Key priorities for implementation

Diagnosis of patients with OHT, COAG or suspected COAG

- At diagnosis offer all patients with COAG or suspected of having COAG and/or OHT:
  - Intraocular pressure measurement using Goldmann applanation tonometry (slit lamp mounted)
  - Central corneal thickness measurement
  - Peripheral anterior chamber configuration and depth assessments using gonioscopy
  - Visual field measurement using standard automated perimetry (central thresholding test)
  - Optic nerve assessment using stereoscopic slit lamp biomicroscopy with dilated fundus examination. [1.1.1]

- Records of all previous tests and images relevant to COAG and OHT assessment should be available at each clinical episode to all health care professionals involved in a patient’s care. [1.1.6]

Monitoring of patients with OHT, COAG or suspected COAG

- Patients with OHT and COAG suspects eligible to receive medication should be monitored at regular intervals defined by their risk of progression to COAG as illustrated in the following table:
### Table: Monitoring intervals for patients with OHT and COAG suspects

<table>
<thead>
<tr>
<th>Clinical assessment</th>
<th>Monitoring intervals in months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intraocular pressure (IOP) acceptable *</td>
</tr>
<tr>
<td>Yes</td>
<td>Low</td>
</tr>
<tr>
<td>Yes</td>
<td>High</td>
</tr>
<tr>
<td>No</td>
<td>Low</td>
</tr>
<tr>
<td>No</td>
<td>High</td>
</tr>
</tbody>
</table>

*IOP acceptable = patient is treated and IOP is at target. If IOP cannot be adequately controlled medically refer to consultant ophthalmologist.

For patients started on treatment for the first time IOP should be checked in 1 to 4 months following commencement of medication.

[1.2.10]

- Patients with COAG should be monitored at regular intervals defined by risk of progression as illustrated in the following table:
### Table: Monitoring intervals for patients with COAG

<table>
<thead>
<tr>
<th>Clinical assessment</th>
<th>Monitoring intervals in months</th>
<th>IOP alone</th>
<th>IOP, optic disc and visual field</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP acceptable*</td>
<td>Progression **</td>
<td>Outcome</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Continue treatment</td>
<td>NA</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Change treatment***</td>
<td>1 to 4</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>Change treatment***</td>
<td>1 to 4</td>
</tr>
<tr>
<td>No</td>
<td>Yes / uncertain</td>
<td>Change treatment***</td>
<td>1 to 2</td>
</tr>
</tbody>
</table>

*IOP acceptable = IOP at target
For patients started on treatment for the first time IOP should be checked in 1 to 4 months following commencement of medication.

**Progression = increased optic nerve damage or visual field change
***Change treatment may include change to topical medication, laser or surgery. For laser or surgery the patient re-enters the table according to clinical parameters following full recovery from the intervention

[1.2.15]

### Treatment for patients with OHT and suspected COAG

- Patients with OHT and COAG suspects with high IOP should be offered initial treatment based on estimated risk of progression to COAG using IOP, central corneal thickness (CCT) and age as illustrated in the following table:
### Table: Treatment of OHT and COAG suspects

<table>
<thead>
<tr>
<th>CCT</th>
<th>&gt;590 μm</th>
<th>555-590 μm</th>
<th>&lt;555 μm</th>
<th>Any</th>
<th>&gt;21-25 mmHg</th>
<th>&gt;25-32 mmHg</th>
<th>&gt;21-25 mmHg</th>
<th>&gt;25-32 mmHg</th>
<th>&gt;21-25 mmHg</th>
<th>&gt;25-32 mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated IOP</td>
<td>No treat-ment</td>
<td>No treat-ment</td>
<td>No treat-ment</td>
<td>BB**</td>
<td>BB</td>
<td>PGA***</td>
<td>PGA</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

*Treatment should not be routinely offered to patients over the age threshold unless there are likely to be benefits from the treatment over an appropriate time scale.

** BB, beta-blockers.

*** PGA, prostaglandin analogues.

[1.3.1]

### Treatment for patients with COAG

- Patients newly diagnosed with early or moderate COAG should be offered treatment with a prostaglandin analogue. [1.4.1]

- Patients with COAG who have visual field progression and/or progression of disc damage in one or both eyes, despite treatment, should be offered surgery with pharmacological augmentation (mitomycin C [MMC] or 5-fluorouracil [5FU]). Offer patients information on risks and benefits associated with surgery. [1.4.5]

### Service provision

- Patients with suspected optic nerve damage or visual field defect should be referred to a consultant ophthalmologist for consideration of a definitive diagnosis of COAG and formulation of a management plan. [1.5.2]

- Patients with OHT, COAG suspects and COAG patients should be monitored and treated by a trained healthcare professional with:
  - A specialist qualification (should one be available to that professional group) recognised by their professional body
  - Relevant experience
  - Ability to detect a change in clinical status. [1.5.4]
Provision of information for patients

- Offer patients the opportunity to discuss their diagnosis and prognosis, and provide relevant information in an accessible format at initial and subsequent visits. This may include information on:

  - Their specific condition (OHT, COAG suspect and COAG), its life-long implications and their prognosis for retention of vision
  - Knowledge that once lost, vision cannot be recovered
  - That COAG and OHT are symptomless
  - That most patients treated for COAG will not lose their vision
  - The importance of a patient’s role in their own treatment, for example ongoing regular application of eye drops in order to preserve vision
  - Different types of treatment options including frequency and severity of side effects, risks and benefits of their treatment
  - How to apply eye drops including technique (punctual occlusion and devices), hygiene (storage)
  - The necessity for regular monitoring as specified by the clinician
  - Methods of investigations during assessment
  - The length of time and the need for assistance required for attending each appointment
  - Implications for their family
  - Support groups – International Glaucoma Association (IGA), Royal National Institute of Blind People (RNIB) and other
  - Certificate of Visual Impairment (CVI) registration
  - Driver and Vehicle Licensing Agency information. [1.6.1]
1 Guidance

The following guidance is based on the best available evidence. The full guideline (Glaucoma: diagnosis and management of chronic open angle glaucoma and ocular hypertension) gives details of the methods and the evidence used to develop the guidance. (See section 5 for details)

1.1 Diagnosis of patients with OHT, COAG or suspected COAG

1.1.1 At diagnosis offer all patients with COAG or suspected of having COAG and/or OHT:

- Intraocular pressure measurement using Goldmann applanation tonometry (slit lamp mounted)
- Central corneal thickness measurement
- Peripheral anterior chamber configuration and depth assessments using gonioscopy
- Visual field measurement using standard automated perimetry (central thresholding test)
- Optic nerve assessment using stereoscopic slit lamp biomicroscopy with dilated fundus examination.
1.1.2 Clinicians should adopt professional / Department of Health guidance to decrease the risk of transmission of infective agents via a contact tonometer head or other contact diagnostic instruments.

1.1.3 Van Herick’s test should be used as an alternative where clinical circumstances preclude gonioscopy (e.g. where patients with physical or intellectual impairment are unable to co-operate with examination).

1.1.4 Clinicians should adopt professional / Department of Health guidance to decrease the risk of transmission of infective agents via gonioscopy.

1.1.5 An optic disc image should be obtained at diagnosis for baseline documentation.

1.1.6 Records of all previous tests and images relevant to COAG and OHT assessment should be available at each clinical episode to all health care professionals involved in a patient’s care.

1.1.7 Where clinical circumstances preclude the use of standard methods of assessment (e.g. where patients with physical or learning disabilities are unable to be examined) alternative methods of assessment should be offered.

1.1.8 All machines and measurement instruments should be calibrated regularly according to manufacturer's instructions.
1.2 Monitoring of patients with OHT, COAG or suspected COAG

1.2.1 Offer Goldmann applanation tonometry (slit lamp mounted) to all patients with COAG or suspected of having COAG and/or OHT at each monitoring assessment.

1.2.2 Central corneal thickness measurement should be repeated as necessary.

1.2.3 Offer Van Herick’s peripheral anterior chamber depth assessment to all patients with COAG or suspected of having COAG and/or OHT at each monitoring assessment.

1.2.4 Gonioscopy should be repeated when clinically indicated (e.g. where there is uncertainty or suspected change).

1.2.5 Offer standard automated perimetry (central thresholding test) to all patients with COAG or suspected of having COAG and/or OHT at monitoring assessments.

1.2.6 The same visual field measurement strategy should be used for every visual field test.

1.2.7 Offer stereoscopic slit lamp biomicroscopic examination of the optic disc to all patients with COAG or suspected of having COAG and/or OHT at monitoring assessments.

1.2.8 When a change in optic disc status is detected by biomicroscopic slit lamp examination, a new optic disc image should be obtained for the patient’s records in order to provide a fresh benchmark for future assessments.

1.2.9 When an adequate view is unavailable at a monitoring visit, patients undergoing stereoscopic slit lamp biomicroscopy should have their pupils dilated before the assessment.
1.2.10 Patients with OHT and COAG suspects eligible to receive medication should be monitored at regular intervals defined by their risk of progression to COAG as illustrated in the following table:

**Table: Monitoring intervals for patients with OHT and COAG suspects**

<table>
<thead>
<tr>
<th>Clinical assessment</th>
<th>Monitoring intervals in months</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP acceptable *</td>
<td>Risk of progression to COAG</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Yes</td>
<td>Low</td>
</tr>
<tr>
<td>Yes</td>
<td>High</td>
</tr>
<tr>
<td>No</td>
<td>Low</td>
</tr>
<tr>
<td>No</td>
<td>High</td>
</tr>
</tbody>
</table>

*IOP acceptable = patient is treated and IOP is at target. If IOP cannot be adequately controlled medically refer to consultant ophthalmologist. For patients started on treatment for the first time IOP should be checked in 1 to 4 months following commencement of medication.

1.2.11 Discuss the benefits and harms of stopping treatment with patients who have:

- a low risk of ever developing visual impairment within their lifetime
- OHT or suspected COAG
- an acceptable intraocular pressure.

1.2.12 If the patient decides to stop treatment, offer to assess their IOP within 1 to 4 months with further monitoring if deemed clinically necessary.

1.2.13 In patients with OHT and COAG suspects who are not eligible for medication, assess IOP, optic disc and visual field at the following intervals:

- between 12 and 24 months if low risk of optic disc damage
DRAFT FOR CONSULTATION

- between 6 and 12 months if high risk of optic disc damage.

If no change in the parameters is detected after 3-5 years the patient should be discharged.

1.2.14 At discharge advise patients who are ineligible for treatment and deemed stable to remain in regular contact (annual) with their primary care optometrist to facilitate detection of possible future changes in their condition.

1.2.15 Patients with COAG should be monitored at regular intervals defined by risk of progression as illustrated in the following table:

Table: Monitoring intervals for patients with COAG

<table>
<thead>
<tr>
<th>Clinical assessment</th>
<th>Monitoring intervals in months</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP acceptable*</td>
<td>Monitoring intervals in months</td>
</tr>
<tr>
<td>Progression **</td>
<td>IOP alone</td>
</tr>
<tr>
<td>Outcome</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>No</td>
<td>Yes / uncertain</td>
</tr>
</tbody>
</table>

*IOP acceptable = IOP at target
For patients started on treatment for the first time IOP should be checked in 1 to 4 months following commencement of medication.

**Progression = increased optic nerve damage or visual field change

***Change treatment may include change to topical medication, laser or surgery. For laser or surgery the patient re-enters the table according to clinical parameters following full recovery from the intervention.
1.2.16 Following full recovery from surgery or laser treatments, monitoring should re-commence according to IOP, optic disc appearance and visual field.

1.3  Treatment for patients with OHT and suspected COAG

1.3.1 Patients with OHT and COAG suspects with high IOP should be offered initial treatment based on estimated risk of progression to COAG using IOP, CCT and age as illustrated in the following table:

Table: Treatment of OHT and COAG suspects

<table>
<thead>
<tr>
<th>CCT</th>
<th>&gt;590 μm</th>
<th>555-590 μm</th>
<th>&lt;555 μm</th>
<th>Any</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated IOP</td>
<td>&gt;21-25 mmHg</td>
<td>&gt;25-32 mmHg</td>
<td>&gt;21-25 mmHg</td>
<td>&gt;25-32 mmHg</td>
</tr>
<tr>
<td>Age threshold*</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>55 years</td>
</tr>
<tr>
<td>Treatment</td>
<td>No treatment</td>
<td>No treatment</td>
<td>No treatment</td>
<td>BB**</td>
</tr>
</tbody>
</table>

*Treatment should not be routinely offered to patients over the age threshold unless there are likely to be benefits from the treatment over an appropriate time scale.

** BB, beta-blockers.

*** PGA, prostaglandin analogues.
1.3.2 COAG suspects with normal IOP should not be treated.

1.3.3 Offer an alternative medication to treated OHT and COAG suspect patients with unacceptable IOP.

1.3.4 Offer alternative monotherapy (prostaglandin analogues [PGA], beta-blockers [BB], others) to patients with OHT and COAG suspects with high IOP who are intolerant of the current medication.

1.3.5 Offer a preservative-free preparation to high risk patients (IOP >25-32 μm and CCT <555 μm; or IOP >32 mmHg) with allergy to preservatives.

1.4 Treatment for patients with COAG

1.4.1 Patients newly diagnosed with early or moderate COAG should be offered treatment with a prostaglandin analogue.

1.4.2 Patients presenting with severe COAG should be offered early surgery with pharmacological augmentation (MMC or 5FU) as indicated to prevent progression to complete blindness. Offer patients information on risks and benefits associated with surgery. Patients listed for surgery should be offered interim treatment with a prostaglandin analogue.

1.4.3 Patients using the prescribed pharmacological treatment should be encouraged to continue with the same treatment unless:

- The patient has an unacceptable IOP
- There is a progression of disc damage
- There is visual field defect progression
- The patient is intolerant to the drug.

1.4.4 In COAG patients whose intraocular pressure is unacceptable after using pharmacological treatment, check patient concordance and
drop instillation technique. If necessary, patients should be offered one of the following:

- Alternative monotherapy (PGA, BB, others)*
- Laser
- Surgery.

*After trying two alternative monotherapies consider offering surgery.

1.4.5 Patients with COAG who have visual field progression and/or progression of disc damage in one or both eyes, despite treatment, should be offered surgery with pharmacological augmentation (MMC or 5FU). Offer patients information on risks and benefits associated with surgery.

1.4.6 If a patient with COAG is intolerant to a prescribed medication consider:

- Alternative monotherapy (PGA, BB, others)
- A preservative-free preparation if there is evidence of allergy to preservative

After trying two medications consider offering surgery.

1.4.7 After surgery, COAG patients with unacceptable intraocular pressure should be offered one of the following:

- Pharmacological treatment (PGA, BB, others)
- Further surgery
- Laser.

1.4.8 Patients with COAG who prefer not to have surgery or who are not suitable for surgery should be offered one of the following:

- Alternative pharmacological treatment (PGA, BB, others)
- Laser.
1.4.9 Check that there are no co-morbidities or potential drug interactions before offering medication.

1.5 **Service provision**

1.5.1 Diagnosis of OHT and COAG suspect status should be made by a trained healthcare professional with a specialist qualification (should one be available to that professional group) recognised by their professional body and relevant experience.

1.5.2 Patients with suspected optic nerve damage or visual field defect should be referred to a consultant ophthalmologist for consideration of a definitive diagnosis of COAG and formulation of a management plan.

1.5.3 Healthcare professionals involved in initial assessment and 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:

- Medical and ocular history
- Differential diagnosis
- Goldmann applanation tonometry (slit lamp mounted)
- Standard automated perimetry (central thresholding test)
- 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
- Central corneal thickness measurement.
1.5.4 Patients with OHT, COAG suspects and COAG patients should be monitored and treated by a trained healthcare professional with:

- A specialist qualification (should one be available to that professional group) recognised by their professional body
- Relevant experience
- Ability to detect a change in clinical status.

1.5.5 Healthcare professionals involved in the monitoring and treatment of patients with OHT, suspected COAG and established COAG should be trained to make management decisions regarding the following:

- Risk factors for conversion to COAG
- Co-existing pathology
- Risk of vision loss
- Monitoring and clinical status change detection (e.g. visual field changes, stereoscopic slit lamp biomicroscopic examination of anterior segment and posterior segment)
- Pharmacology of IOP lowering medications
- Treatment changes.

1.6 **Provision of information for patients**

1.6.1 Offer patients the opportunity to discuss their diagnosis and prognosis, and provide relevant information in an accessible format at initial and subsequent visits. This may include information on:

- Their specific condition (OHT, COAG suspect and COAG), its life-long implications and their prognosis for retention of vision
- Knowledge that once lost, vision cannot be recovered
- That COAG and OHT are symptomless
- That most patients treated for COAG will not lose their vision
- The importance of a patient’s role in their own treatment, for example ongoing regular application of eye drops in order to preserve vision
• Different types of treatment options including frequency and severity of side effects, risks and benefits of their treatment
• How to apply eye drops including technique (punctual occlusion and devices), hygiene (storage)
• The necessity for regular monitoring as specified by the clinician
• Methods of investigations during assessment
• The length of time and the need for assistance required for attending each appointment
• Implications for their family
• Support groups – International Glaucoma Association (IGA), Royal National Institute of Blind People (RNIB) and other
• Certificate of Visual Impairment (CVI) registration
• Driver and Vehicle Licensing Agency information.

2 Notes on the scope of the guidance

NICE guidelines are developed in accordance with a scope that defines what the guideline will and will not cover. The scope of this guideline is available from http://www.nice.org.uk/guidance/index.jsp?action=download&o=37110.

2.1 What the guideline covers

This guideline covers adults (18 and older) with a diagnosis of chronic open angle glaucoma or ocular hypertension, including variants associated with pseudoexfoliation or pigment dispersion. Options for diagnosis and diagnostic tests, monitoring, pharmacological, surgical, laser and complementary or alternative treatments, and service models are considered in terms of clinical effectiveness and cost effectiveness, upon which recommendations are based.

2.2 What the guideline does not cover

This guideline does not cover patients under the age of 18 years. In addition, the guideline does not cover patients with the following types of glaucoma: secondary glaucomas, for example neovascular or uveitic (except for those associated with pseudoexfoliation or pigment dispersion which are included as...
described above), those with, or at risk of, primary or secondary angle closure glaucoma, and adults with primary congenital, infantile or childhood glaucoma.

### How this guideline was developed

NICE commissioned the National Collaborating Centre for Acute Care to develop this guideline. The Centre established a Guideline Development Group (see appendix A), which reviewed the evidence and developed the recommendations. An independent Guideline Review Panel oversaw the development of the guideline (see appendix B).

There is more information in the booklet: ‘The guideline development process: an overview for stakeholders, the public and the NHS’ (third edition, published April 2007), which is available from www.nice.org.uk/guidelinesprocess or from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote reference N1233).

### 3 Implementation

The Healthcare Commission assesses how well NHS organisations meet core and developmental standards set by the Department of Health in ‘Standards for better health’ (available from www.dh.gov.uk). Implementation of clinical guidelines forms part of the developmental standard D2. Core standard C5 says that NHS organisations should take into account national agreed guidance when planning and delivering care.

NICE has developed tools to help organisations implement this guidance (listed below). These are available on our website (www.nice.org.uk/CGXXX).

[NICE to amend list as needed at time of publication]

- Slides highlighting key messages for local discussion.
- Costing tools:
  - costing report to estimate the national savings and costs associated with implementation
  - costing template to estimate the local costs and savings involved.
4 Research recommendations

The Guideline Development Group has made the following recommendations for research, based on its review of evidence, to improve NICE guidance and patient care in the future.

4.1 Monitoring patients with OHT, COAG and suspected COAG

What is the clinical and cost effectiveness of different monitoring intervals for detection of disease progression in COAG patients at risk of progression?

Why this is important

The answer to this question is key to guidance on chronic disease monitoring intervals in this guideline. Currently there is no identifiable randomised controlled trial (RCT) evidence in this area. Once diagnosed, COAG patients face lifelong treatment and monitoring. Risk guided intervals would allow those at high risk of progression to receive more intensive monitoring and relieve the burden of unnecessary monitoring visits on those with slowly progressive disease. Resources would be more appropriately focused on those at greatest risk and with more effective early detection of progression, damage to vision over time may be minimised. The study design suggested is a randomised comparative trial of 3 perceived risk strata (rapid, medium, slow) for progression to be randomised to 2, 3 and 2 alternative monitoring intervals respectively. The outcome would be the progression events detected.

4.2 Update of the National Survey of Trabeculectomy

What are the current NHS national benchmarks for surgical success and complications in patients with COAG undergoing trabeculectomy drainage surgery with and without pharmacological augmentation?
**Why this is important**

The answer to this question would provide more accurate and up to date evidence for surgical treatment in COAG. Information on surgical success and complication rates would provide benchmarks for clinical audit and assist in planning service provision. It would inform patients of what to expect from their surgery in terms of the chances of success and complications. The current evidence base is the National Survey of Trabeculectomy. This is now 10 years old and techniques have changed. The ‘survey audit’ would set a standard against which newer techniques could be evaluated. The study design would be similar to the audit of 10 years ago to make it possible to compare the outcomes now in the light of changes in technique and the recommendations made by that audit.

### 4.3 Laser treatment

What is the effectiveness and cost-effectiveness of initial argon, diode or selective laser trabeculoplasty treatment compared to PGA alone or laser plus PGA in combination in patients with COAG?

**Why this is important**

The answer to this question would provide data on the comparative effectiveness and cost effectiveness of laser treatment versus modern ocular hypotensive agents, particularly PGA analogues. Laser treatment may offer a period of pressure control without the need for topical medications in some patients. In others, it may offer additional benefit to topical medications and in both cases there may be cost efficiencies and improved prevention of progression of the disease. Existing trials of laser trabeculoplasty compared to medical treatment refer to outdated pharmacological agents. Because of the lack of evidence, the role of laser trabeculoplasty in COAG management cannot be clearly defined. The study design to answer the research question should be a randomised controlled trial in primary research. To enable double masking or at least single masking, some form of sham laser treatment will be needed.
4.4 **Service provision**

In patients identified on primary examination as exhibiting possible COAG, OHT or COAG suspect status, what is the comparative effectiveness of diagnosis by different healthcare professions?

**Why this is important**

The answer to this question has the potential to increase available staff resource and to improve access to care, both in terms of number of available clinicians and locations. The current available evidence base in the area of this research recommendation is weak. One RCT exists, but is of limited generalisability due to its design. No large scale service provision research in this subject area has been executed in over 10 years although the Department of Health did pilot alternative COAG care pathways, demonstrating central government interest in this subject area. Primary research will be required to answer the questions contained within this research recommendation. A number of randomised controlled trials will be required.

4.5 **Provision of information for patients**

What is the clinical and cost effectiveness of providing patients with COAG with a ‘glaucoma card’ or individual record of care compared to standard treatment?

**Why this is important**

The answer to this question would provide evidence of better care in terms of treatment outcome and patient experience. Patient involvement in and understanding of management of COAG could reduce stress and uncertainty for patients and potentially improve concordance with medical treatment requirements, with resultant improved outcome of prolonged sighted lifetime. No randomised control trials or systematic reviews were identified in our literature review. The study design for the proposed research should be a randomised controlled trial. A qualitative research component would be needed to develop both an appropriate intervention and patient focused outcome measure to assess patient experience. A standard visual function
(field of vision) test would be appropriate for evaluation of visual outcome. It would require a significant sample size and duration to determine visual outcome with associated cost implications. The time scale to assess useful outcomes would be long, probably 5 years or more.

5 Other versions of this guideline

5.1 Full guideline

The full guideline 'Glaucoma: diagnosis and management of chronic open angle glaucoma and ocular hypertension', contains details of the methods and evidence used to develop the guideline. It is published by the National Collaborating Centre for Acute Care and is available from [NCC website details to be added], our website (www.nice.org.uk/CGXXXfullguideline) and the National Library for Health (www.nlh.nhs.uk). [Note: these details will apply to the published full guideline.]

5.2 Quick reference guide

A quick reference guide for healthcare professionals is available from www.nice.org.uk/CGXXXquickrefguide

For printed copies, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk (quote reference number N1XXX). [Note: these details will apply when the guideline is published.]

5.3 ‘Understanding NICE guidance’

Information for patients and carers (‘Understanding NICE guidance’) is available from www.nice.org.uk/CGXXXpublicinfo

For printed copies, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk (quote reference number N1XXX). [Note: these details will apply when the guideline is published.]

We encourage NHS and voluntary sector organisations to use text from this booklet in their own information about chronic open angle glaucoma.
6 Related NICE guidance

Published

7 Updating the guideline

NICE clinical guidelines are updated as needed so that recommendations take into account important new information. We check for new evidence 2 and 4 years after publication, to decide whether all or part of the guideline should be updated. If important new evidence is published at other times, we may decide to do a more rapid update of some recommendations.
Appendix A: The Guideline Development Group

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Appendix B: The Guideline Review Panel

The Guideline Review Panel is an independent panel that oversees the development of the guideline and takes responsibility for monitoring adherence to NICE guideline development processes. In particular, the panel ensures that stakeholder comments have been adequately considered and responded to. The panel includes members from the following perspectives: primary care, secondary care, lay, public health and industry.

[NICE to add]

[Name; style = Unnumbered bold heading]
[job title and location; style = NICE normal]
Appendix C: The algorithms

ALGORITHM 1 - DIAGNOSIS

ASSESSMENT

IOP
- IOP > 21 mmHg
  - Normal
  - Normal or uncertain

optic nerve
- Normal

visual field
- Normal

COAG suspect
- High IOP
  - OHT pathway
- Normal IOP
  - COAG suspected pathway

COAG
- Damage
  - COAG pathway
- Defects
  - COAG pathway
ALGORITHM 2 - OHT PATHWAY (OHT and COAG suspects with high IOP)

ALGORITHM 3 - COAG SUSPECT PATHWAY (COAG suspects with Glaucoma)

Glaucoma: NICE guideline DRAFT (September 2008)
normal IOP)

COAG SUSPECT

No treatment

MONITORING

IOP, optic disc and visual field

Low risk of damage
12 – 24 months

High risk of damage
6 – 12 months

IOP

Acceptable
Normal or suspicious

Unacceptable
Normal or uncertain

Any
Damage
Defects

Acceptable
Normal

Optic nerve

No defects

Visual field

Discharge

OHT pathway

COAG pathway

Discharge

* after 3-5 years if no change