The ROYAL COLLEGE of OPHTHALMOLOGISTS

CLINICAL COUNCIL

FOR EYE HEALTH COMMISSIONING

Final

Commissioning Guide: Glaucoma (Recommendations)

June 2016

NICE has accredited the process used by **The Royal College of Ophthalmologists** to produce its **Commissioning Guidance**. Accreditation is valid for 5 years from **1 September 2015.** More information on accreditation can be viewed at www.nice.org.uk/accreditation

18 Stephenson Way, London, NW1 2HD T. 020 7935 0702
contact@rcophth.ac.uk rcophth.ac.uk @RCOphth

Contents

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1. Abbreviations

5FU	5-Fluorouracil - an anti-scarring agent used for some glaucoma surgical procedures
AACG	Acute Angle Closure Glaucoma which is of sudden onset typically with very high pressure elevation
AAO	American Academy of Ophthalmology
AMD	Age-Related Macular Degeneration - a common, potentially blinding disease of the retina
BB	Beta-Blocker (topical preparation) - a common eye drop medication for glaucoma
CAI	Carbonic Anhydrase Inhibitor - a medication class used both topically (eye drop) and systemically in the management of glaucoma
CCG	Clinical Commissioning Group
CCT	Central Corneal Thickness - this is known to influence IOP measurements
COAG	Chronic Open Angle Glaucoma. This term is adopted from the NICE Glaucoma Guideline - CG85 and includes variants: with elevated pressure, Primary Open Angle Glaucoma (POAG); with normal pressure, Normal Tension Glaucoma (NTG); with Pseudo-exfoliation (PXF); and pigment dispersion syndrome (PDS).
CoO	College of Optometrists
CQUIN	Commissioning for Quality and Innovation - a framework for securing improvements in quality of services and better outcomes for patients, whilst also maintaining strong financial management.
CVI	Certificate of Vision Impairment
DNA	Did Not Attend appointment
EAGLE	Effectiveness, in Angle-closure Glaucoma, of Lens Extraction study - a multi-centre clinical trial
ECLO	Eye Clinic Liaison Officer or Eye Care Liaison Officer (both terms being used). Their roles include provision of support and information to people attending eye care services.
GAT	Goldmann Applanation Tonometry
GDG	Guidance Development Group
GOS	General Ophthalmic Services
HCP	Health Care Professional / Practitioner
HES	Hospital Eye Service
IGA	International Glaucoma Association
IOP	Intraocular Pressure - the pressure inside the eye. A high IOP is an important risk factor for glaucoma
LiGHT	Laser in Glaucoma and Ocular Hypertension study - a multi-centre clinical trial
LOCSU	Local Optical Committee Support Unit
LPI	Laser Peripheral Iridotomy - an outpatient laser procedure used in the management of patients with narrow angles
LVI	Letter of Vision Impairment - for a patient to self-complete and send to the Sensory Impairment Team at Social Services
MMC	Mitomycin C - an anti-scarring agent used for some glaucoma surgical procedures
NCT	Non-Contact Tonometry - measures IOP using a "puff of air"
NICE	National Institute for Health and Care Excellence

NPSA	National Patient Safety Agency
NTG	Normal Tension Glaucoma - a low pressure variant of COAG
OHT	Ocular Hypertension - elevated eye pressure with open angles, normal optic discs and normal visual fields (with or without pigment dispersion or pseudo-exfoliation)
PAC	Primary angle closure - Primary Narrow Angle with elevated pressure and normal optic discs and visual fields
PACG	Primary angle closure glaucoma - Primary Narrow Angle Glaucoma which is chronic
PACS	Primary angle closure suspect - Primary Narrow Angle with normal pressure and normal optic discs and visual fields (such eyes are at risk of possible future AACG, PAC, PACG)
PAS	Peripheral Anterior Synechiae - fibrous adhesions formed between the peripheral cornea and iris, a sign of PACG
PDS	Pigment dispersion syndrome - a condition affecting the pigment of the anterior segment of the eye which is associated with open angle glaucoma
PGA	Prostaglandin Analogue (topical preparation) - a common first line eye drop medication for glaucoma
PICO	A question phrased to search out specific information from the published medical literature for a particular Population of Patients or People, an Intervention, a Comparison between groups and with reference to an Outcome
POAG	Primary Open Angle Glaucoma - a high pressure variant of COAG
POEM	Patient-reported Outcome and Experience Measure
PREM	Patient Reported Experience Measure
PROM	Patient Reported Outcome Measure
PXF	Pseudo-exfoliation - a condition affecting the anterior segment of the eye which is associated with open angle glaucoma
QIPP	Quality, Innovation, Productivity and Prevention - quality assured examples of improvements in quality and productivity across the NHS and social care
QS	Quality Standard - NICE and the Royal College of Ophthalmologists have produced these for Glaucoma and related conditions
RCOphth	Royal College of Ophthalmologists
RNIB	Royal National Institute of Blind People
RVI	Referral of Vision Impairment - for a community or hospital-based optometrist to refer a patient to Social Services, e.g. if the patient requires help but is not eligible or declines registration, or has not seen an ophthalmologist
SeeAbility	A national charity which works with people with sight loss and multiple disabilities
VEGF	Vascular Endothelial Growth Factor - anti-VEGF pharmacological treatments are used in some cases of secondary glaucoma

2. Introduction: Glaucoma

Glaucoma is a common sight threatening disease that affects the optic nerve. If not diagnosed, monitored and treated correctly, glaucoma can result in severe loss of vision or blindness. Approximately 10% of UK blindness registrations are related to glaucoma. Vision lost due to glaucoma is not recoverable. Therefore, successful management of glaucoma requires lifelong monitoring and treatment to prevent or minimise further vision loss; on average a person diagnosed with glaucoma will have one initial visit and 40 follow up visits.

People with glaucoma often do not experience symptoms until the disease is advanced and there has already been considerable damage to the person's vision. Therefore, people at high risk of glaucoma need to be monitored to diagnose and treat glaucoma at an early stage. Fifty percent of glaucoma in the community remains undiagnosed; previously undetected cases are largely identified at routine sight tests by community optometrists.

There is evidence that the most deprived geographical areas are least served by optometry practices and people in these areas may therefore be at an increased risk of a delayed diagnosis of glaucoma. Similarly, there may be missed cases of glaucoma in 'hard to reach' groups, including vulnerable individuals, homeless people, and people with special needs, where access to routine optometric services and opportunistic case finding may be limited or unavailable.

The commonest type of glaucoma in the UK is chronic open angle glaucoma (COAG), affecting around 2% of people older than 40 years and rising to almost 10% in people older than 75 years in white Europeans. Around half a million people are currently affected by COAG in England and there are over a million glaucoma-related outpatient visits in the hospital eye service (HES) annually. The number of individuals affected by COAG is expected to rise due to changes in population demographics.

The prevalence of COAG is higher in people of black African or black Caribbean descent and in people who have a family history of the condition. These people, as well as people living in deprived areas with poor access to services, are at highest risk of becoming blind due to glaucoma.

Ocular hypertension (OHT) is a very important risk factor for COAG, although COAG can occur with or without raised eye pressure. 'Simple' OHT is defined as consistently or recurrently elevated intraocular pressure (IOP) greater than 21 mmHg with open anterior chamber angles, normal visual fields and healthy optic discs (nerve heads). OHT may occur in the presence of clinical features suggestive of possible future development of sight threatening glaucoma, such as equivocal visual field test results or suspicious optic nerve appearances. It is estimated that 3–5% of people over the age of 40 have OHT, which represents around 1 million people in England.

Over 30% of glaucoma related NHS Hospital Eye Service attendances are related to OHT and suspected glaucoma, and much of this workload could be commissioned in the community under appropriately governanced contracting. This approach has the potential to relieve the HES of significant workload and to assist with current chronic HES under capacity.

As with other medical conditions it is the clinical needs of patients which ultimately dictate the necessary skills, competences and experience required of Health Care Professionals (HCPs) to deliver services for different levels of clinical case complexity. These requirements have been set out by NICE in the Glaucoma Clinical Guideline (CG85) and the NICE Glaucoma Quality Standard (QS7). In the context of care for glaucoma by non-medically qualified HCPs, the College of Optometrists (CoO) has been particularly active in developing a suite of higher

professional qualifications which align to various levels of clinical case complexity in glaucoma (Professional Certificate in Glaucoma, Higher Professional Certificate in Glaucoma, Diploma in Glaucoma). Whilst it must be stressed that these training and experience requirements apply to all health care professionals, in this guideline we have used the CoO higher qualifications as an illustrative example because they map directly to NICE requirements, they are the most highly developed, and they relate to the professional group outside of medicine which currently has the greatest level of involvement in glaucoma related care. Equivalent qualifications which adhere to the necessary standards would be equally acceptable. Within the next 3 years, providers delivering higher qualifications should consider making these qualifications more accessible to allow appropriate up-skilling of the workforce.

Alternative qualifications may also in future apply to non-optometric HCPs; it is the skill set of the HCP which is of primary importance, and ideally access to training should be available to all relevant and interested allied health professional groups.

Primary angle-closure glaucoma (PACG) is less common than COAG, but it is associated with higher rates of blindness. PACG is more common in people of far eastern origin. The acute form of PACG requires urgent treatment in the HES. Whilst chronic PACG shares many care pathway features with COAG, there are investigations and treatments which are specific to the management of PACG. In contrast to primary COAG and PACG, secondary glaucomas are associated with raised IOP due to a recognised ocular or systemic disease or pharmacological treatment.

Common forms of secondary glaucoma include uveitic glaucoma, neovascular glaucoma and steroid-induced glaucoma. Pragmatically, NICE include pseudoexfoliative and pigmentary glaucoma within COAG as the main approaches to diagnosis and management are similar to primary COAG.

It is vital for commissioners to understand that glaucoma and related conditions comprise a collection of specific diagnoses and disease severity states within an evolving clinical picture. Individual patients and individual eyes progress and move between severities and diagnostic categories and the care needs of the individual vary accordingly. The disease state described as 'stable glaucoma' is generally time limited.

For certain individuals it may be necessary to manage the condition in the face of considerable clinical uncertainty as accurate visual field test performance may be difficult for some people and others may be unable to co-operate with full clinical assessments for a variety of reasons which may include physical health, mental health, learning difficulty or emotional issues. Services must be accessible to all, meeting equality and diversity requirements, and must be sufficiently intelligent and flexible to identify and respond to changes in the clinical status of patients and their eyes.

Implementation of the guidance is the responsibility of local commissioners and/or providers, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of access. Nothing in the guidance should be interpreted in a way which would be inconsistent with compliance with those duties. It is not intended that this guidance destabilises or stops existing low risk monitoring schemes or those under development as the numbers holding the CoO certificate level are currently small. Where there are existing schemes which do not align with the requirements of NICE CG85, NICE QS7 and this commissioning guideline, a reasonable period of adjustment should be permitted in order to cater for the necessary training and scheme amendments to be put into place. The NICE CG85 update should provide an opportunity for greater clarity in this area of flow between community and hospital care to further inform commissioners. New or updated

recommendations of relevance to commissioning of services for glaucoma and related conditions which arise from the CG85 update will be given due consideration, and if needed, an early review of this commissioning guideline will be undertaken to ensure alignment with the NICE update.

This guidance document applies to commissioning services for adult-onset glaucoma and adults who are at risk of developing glaucoma. The guidance does not apply to paediatric and juvenile glaucoma.

Recommendations Key

NICE and Expert Opinion	AAO PPP & Expert Opinion
NICE, NPSA and Expert Opinion	Expert Opinion
NPSA & Expert Opinion	

3. Commissioning Guidance for Glaucoma

Recommendation 1: Commissioners of glaucoma care should work in partnership with a range of stakeholders, including service users and carers, community optometry services, general practitioners, health and wellbeing boards, the HES, community pharmacy services, established local networks, social care, rehabilitation officers for the visually impaired, voluntary organisations, and adjacent clinical commissioning groups.

Recommendation 2: Commissioners should be mindful of ensuring access for hard to reach groups, including those with special needs. Vulnerable individuals, such as people in long term care and people with learning difficulties, are at increased risk of sight loss and should undergo regular sight tests, including reasonable adjustments as necessary (http://www.rnib.org.uk/knowledge-and-research-hub/research-reports/prevention-sight-loss/prevalence-VI-learning-disabilities).

Recommendation 3: Organisations should use the guidance to assess their current performance against evidence-based measures of best practice, and identify priorities for improvement.

4. High value care pathway

4.1 Introduction

The high value care pathway for glaucoma that is presented in this guidance is based on best available evidence as identified by systematic review of the literature (see Commissioning Guide Glaucoma Long Version). The pathway is compliant with the National Institute for Health and Care Excellence (NICE) recommendations as set out in publications including *Diagnosis and management of chronic open angle glaucoma and ocular hypertension* (NICE clinical guideline 85),[1] *Glaucoma Quality Standard* (NICE quality standard 7),[2] *Glaucoma Pathway*,[3] and *Commissioning Guidance for Services for people at risk of developing glaucoma*.[4] The pathway is also compliant with current guidance from the Royal College of Ophthalmologists (RCOphth) and the College of Optometrists (CoO),[5,6] as well as with recommendations from the National Patient Safety Agency (NPSA).[7]

Table 1: **Recommendation 4:** Recommended care setting options and requisite HCP training for people at risk of glaucoma and for the diagnosis and monitoring of people with glaucoma and related conditions (1a – for newly identified patients; 1b – for established glaucoma patients).

✓ Permitted by NICE and advised;

✗ Not permitted by NICE – should not be commissioned;

CoO: College of Optometrists

HCPs (Health Care Practitioners) may include GPs with a special interest and training

HCPs may or may not be qualified for independent or other forms of prescribing

Note: The CoO Certificate A and Certificate B (B=Diploma in Glaucoma) have now been phased out and replaced by the 'Professional Higher Certificate in Glaucoma' and the 'Professional Diploma in Glaucoma' respectively. In addition, a lower level 'Professional Certificate in Glaucoma' has been introduced by the CoO which will standardise the training required for the new 'enhanced case finding' and for low risk monitoring (here and see Level II in Table 2 below). The CoO qualifications have been designed to map directly to the NICE guideline (CG85) requirements and are used here as an example since they are to date the most well developed NICE compliant series of qualifications for non-medically qualified HCPs. It is anticipated that optometrists and non-optometrist professional groups will move towards gaining these or equivalent qualifications from accredited providers. Those optometrists holding existing LOCSU/WOPEC qualifications may receive partial credit as appropriate.

** Definitions:*

a) According to NICE:

'Repeat measures' is a term specific to glaucoma that primarily describes the repeated measurement of parameters related to the diagnosis of glaucoma. A simple repeat measures scheme may involve repeat measurement of intraocular pressure (IOP) only. Other repeat measures schemes may also include repeated measurement of visual fields and other relevant ocular parameters when clinically necessary.

'Referral refinement' is a term specific to glaucoma management that describes a two-tier assessment in which initial evidence of abnormality during case-finding assessment or screening is validated by a subsequent enhanced assessment which adds value beyond that achieved through a simple 'repeat measures' scheme. A referral refinement service involves the undertaking of tests sufficient for diagnosis of OHT and suspected COAG and the interpretation of these clinical findings, with specialist practitioners who are delivering this service independently, being qualified and experienced in accordance with NICE guidance. 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.

b) Additional to NICE

In addition to established NICE terminology the term 'Enhanced Case Finding' has been introduced to provide for enhanced services which include slit-lamp mounted Goldmann applanation tonometry, dilated slit-lamp indirect biomicroscopy and other relevant or repeated tests deemed necessary by the HCP according to their clinical judgement. (Earlier refresher training / accreditation arrangements for such services are now complimented, standardised and formalised by the CoO Professional Certificate in Glaucoma.)

*** Risk strata:*

Low Risk = COAG suspect or OHT with or without suspicious features, i.e. equivocal optic disc or visual field, and those with PAC who have been successfully treated and have been demonstrated to have non-occludable angles. Essential elements include the fact that the optic disc and visual field are undamaged due to glaucoma and a diagnosis has been established by an appropriately trained and experienced HCP (as specified by NICE) and a management plan has been formulated and communicated along with relevant information for monitoring and triggers for return referral. There is a distinction between monitoring of low risk patients, and the management of low risk patients which requires further qualifications and enables a change of treatment plan within the care setting. Monitoring is a clinical process of following a patient's condition through time to detect changes in clinical or disease status which may require action. Management is a clinical process of reviewing treatment in response to changes in a patient's clinical or disease status.

Medium Risk = Early to moderate established apparently 'stable' glaucoma.

High Risk = Complex glaucoma (inc. COAG, PACG, secondary glaucoma and rare glaucomas). Patients at high risk of significant visual loss and those under active management or requiring, or having recently undergone glaucoma surgery.

*** Referrals should be in line with Joint College Guidance*[6] *on the referral of Glaucoma suspects by community optometrists. In addition, Joint College Guidance allows for defined low risk subgroups who do not require treatment to not be referred. Similarly, people not requiring treatment who have been monitored for a period and who have been found to be stable are advised by NICE to attend their optometrist for annual visits (e.g. people with mild OHT and increased CCT). A repeat measures scheme may provide a useful context for observation of these subgroups of low risk individuals who do not require formal monitoring (see also Table 2).**** Consultant supervision should be in line with the joint college guidance in relation to glaucoma-related care by optometrists.*[8]

Table 1a: Case finding & diagnostic services for newly identified patients

Case setting options	*Repeat Measures (IOP & Fields, Optic disc normal)*	*Enhanced Case Finding (Repeat Measures plus)*	*Referral refinement with Diagnosis of OHT/COAG suspect*	*Glaucoma Diagnosis*
Community				
Community Optometrist (HCP) Core competence ***	✓	×	×	×
Community Optometrist (HCP) CoO Professional Certificate in Glaucoma (or equivalent)	✓	✓	×	×
Optometrist (HCP) with specialist training, competence and experience as specified by NICE. Care may be delivered in Community or Outreach setting. CoO Professional Higher Certificate in Glaucoma (or equivalent) ≈ Glaucoma Certificate A	✓	✓	✓	×
Optometrist (HCP) with highest level specialist training, competence and experience as specified by NICE. Care usually in HES (inc. outreach) and rarely in a Community Optometric setting. CoO Professional Diploma in Glaucoma (or equivalent) ≈ Glaucoma Certificate B	✓	✓	✓	×
Hospital or Consultant Supervised (may include outreach)				
Consultant Ophthalmologist delivered and supervised HES care. **HCPs participating in such supervised services**** may be medically qualified (e.g. trainee ophthalmologists) or non-medically qualified HCPs (e.g. optometrists, nurses, orthoptists)	✓	✓	✓	✓

Table 1b: Risk Stratified Management by Perceived Risk of Progression to Blindness **

Case setting options	*Low Risk (monitoring only)*	*Low Risk (monitoring & management)*	*Medium Risk*	*High Risk*
Care setting only				
Community Optometrist (HCP) Core competence***	×	×	×	×
Community Optometrist (HCP) CoO Professional Certificate in Glaucoma (or equivalent)	✓	×	×	×
Optometrist (HCP) with specialist training, competence and experience as specified by NICE. Care may be delivered in Community or Outreach setting. CoO Professional Higher Certificate in Glaucoma (or equivalent) ≈ Glaucoma Certificate A	✓	✓	×	×
Optometrist (HCP) with highest level specialist training, competence and experience as specified by NICE. Care usually in HES (inc. outreach) and rarely in a Community Optometric setting. CoO Professional Diploma in Glaucoma (or equivalent) ≈ Glaucoma Certificate B	✓	✓	✓	×
Hospital or Consultant Supervised (may include outreach)				
Consultant Ophthalmologist delivered and supervised HES care. HCPs participating in such supervised services** may be medically qualified (e.g. trainee ophthalmologists) or non-medically qualified HCPs (e.g. optometrists, nurses, orthoptists)	✓	✓	✓	✓

4.2 Population to whom the high value care pathway applies

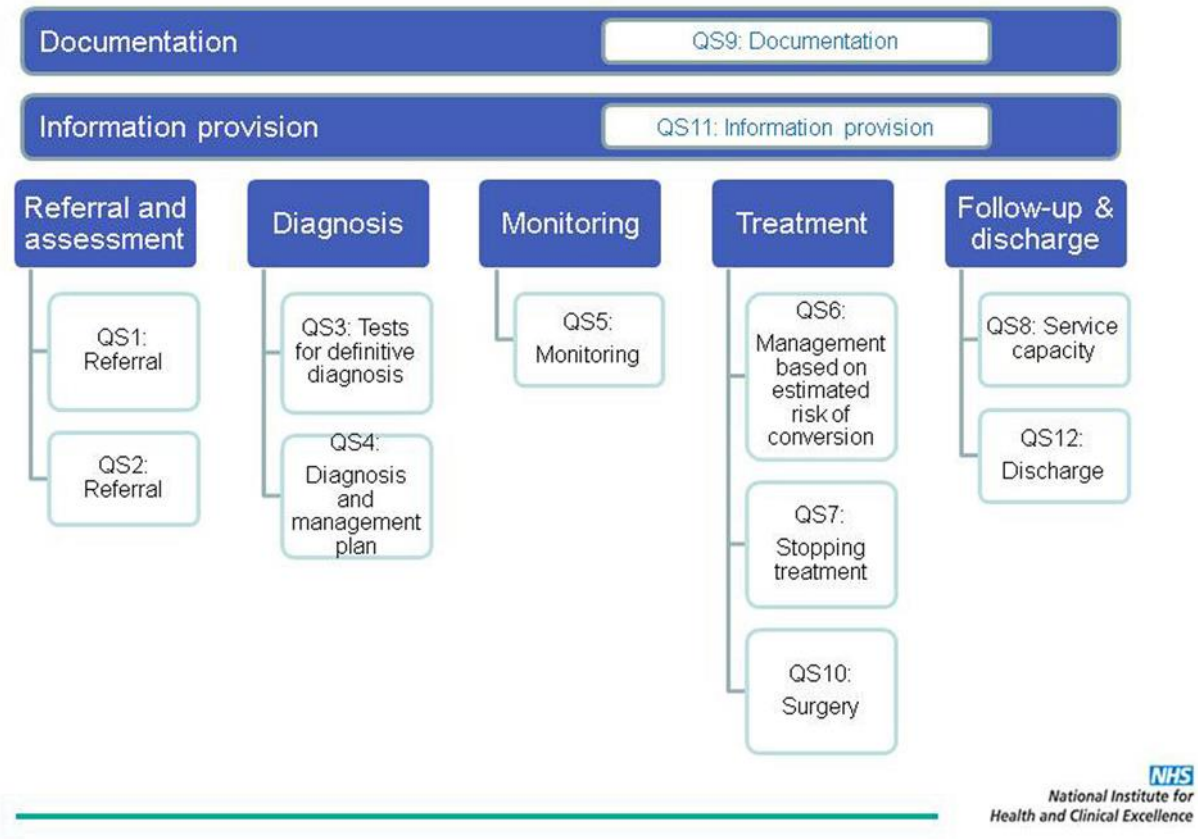
Recommendation 4: Commissioners may need to collaborate with neighbouring CCGs so that care pathways for glaucoma do not confuse or impair the management of people living near two regions covered by different CCGs; i.e. a harmonised approach across local boundaries.

4.3 Mapped areas of the glaucoma care pathway

The following diagram illustrates the areas of the care pathway to which the NICE Glaucoma Quality Standards[2] apply. A high value care pathway for glaucoma should aim to adhere to all

12 quality standards, and the implications of this for commissioners are summarised in this section.

Figure 1: NICE Glaucoma Quality Standards (QS) and the areas of the high value care pathway they apply to.



4.3.1 Documentation

Recommendation 5: Commissioners should ensure that they commission services that make all relevant documentation available at each clinical encounter, including clinical notes and results of specialist investigations.

4.3.2 Information provision

Recommendation 6: Commissioners should ensure that they commission services that conform to the NICE QS11 for all types of glaucoma, including those with narrow angles. Box 1 summarises important elements of information that need to be provided.

Recommendation 7: There should be an Eye Care Liaison Officer (ECLO) service commissioned as part of every glaucoma pathway to work alongside the clinical team in providing information and support.

Recommendation 8: Individuals presenting late and those whose disease has progressed to an advanced stage despite treatment should be made aware of the importance and potential benefits of certification. People whose vision has been affected by glaucoma who may as yet not be eligible for certification should be made aware that in the event of further deterioration of their vision support would be available.

Box 1: Information provision for patients.

Condition

- What is glaucoma and how it causes loss of sight (www.glaucoma-association.com/shop/cat/15.html www.rnib.org.uk/eye-health-eye-conditions-z-eye-conditions/glaucoma)
- The patient's specific condition, including type of glaucoma and prognosis for sight loss
- Glaucoma is asymptomatic in its early stages
- Once sight is lost it cannot be recovered, but if treated most patients will not become blind
- Glaucoma runs in families and some family members can be tested for free under the NHS at an optometric practice: www.nhs.uk/nhsengland/Healthcosts/pages/Eyecarecosts.aspx

Drug treatment

- How eye drops work to lower pressure and prevent or minimise progression of field loss
- Drug treatment for glaucoma is usually life-long, most patients do not require laser or surgery
- The different types and side effects of treatment, including clarification of generic versus branded eye drops and use of more than one type of drop treatment to control disease progression
- Adherence to eye drops is important to delay or prevent progression of glaucoma
- How to instil eye drops, including waiting 5 minutes between instillation (where more than one drop is being used in an eye) and punctal occlusion, through demonstration as well as the provision of accessible information. A useful leaflet is available from the IGA (see below)
- How to get further supplies using repeat prescriptions
- Discuss the use and availability of compliance aids, including eye drop administration aids.
- Information booklets are available to order, free of charge, from the IGA (www.glaucoma-association.com/shop/cat/15.html).

The patient role in the management of the condition

- The need for and importance of regular monitoring and attendance
- How long appointments take and how frequently to expect these
- The methods and importance of investigations and driving restrictions after dilating drops
- The name and contact details of a qualified HCP (e.g. ophthalmic nurse or ECLO) whom patients can contact if they have any queries or drug side effects
- Ensure the patient has time to ask questions at each consultation and is informed about what to expect at each stage, including the timeframes. Key messages should be reinforced through the provision of accessible information.
- Encourage patients to make a note of any questions they have and to raise them at future appointments
- When the patient is discharged, discuss the procedure with them and ensure they understand their follow-up care in the community. Ensure patients receive a copy of their discharge letter and that it is in an accessible format.
- What help is available to allow the patient to fulfil their role, including from the IGA, the RNIB and local voluntary groups.

Additional information

- The regulations for driving and glaucoma (DVLA - Driving Vehicle Licensing Agency) The regulations for driving and glaucoma (DVLA - Driving Vehicle Licensing Agency) https://www.gov.uk/government/publications/assessing-fitness-to-drive-a-guide-for-medical-professionals
- What the Letter of Vision Impairment (LVI), Referral of Vision Impairment (RVI) and Certificate of Vision Impairment (CVI) registration are, where appropriate
- The support groups available for people with glaucoma including the IGA, RNIB and SeeAbility for people with sight loss and multiple disabilities (www.seeability.org/sharing-knowledge/?book=eye-care-conditions#glaucoma).

4.3.3 Referral and assessment

Recommendation 9: Commissioners should ensure they commission services that allow people with OHT or suspected glaucoma (visual field defects or suspicious optic nerve head appearance) to be appropriately assessed in the community before timely referral to a consultant ophthalmologist if glaucoma is still suspected. The additional examination in the community between the initial identification and referral to a consultant ophthalmologist may take the form of "repeated measures", "enhanced case finding" or "referral refinement" as described in this guideline.

Referral for diagnosis of OHT, suspected glaucoma or glaucoma

Recommendation 10: Commissioners should ensure that local systems allow:

- Urgent referrals to be "red-flagged" permitting direct and timely access to the HES. Such urgent cases would include acute angle-closure (see below) or very high IOP (which would be defined locally, but may be ≥32 mmHg)
- HCPs to refer people directly to a consultant ophthalmologist on the basis of examination and test results rather than having to ask a person's GP to refer
- All referrals to indicate relative urgency, so that HESs can manage demand optimally.
- Transfer of complete information on clinical findings including fields (and images where applicable).

4.3.4 Diagnosis

Recommendation 11: The NICE Quality Standard 3 states that "people referred for definitive diagnosis in the context of possible COAG or with OHT receive all relevant tests in accordance with NICE guidance".

Recommendation 12: Optic disc imaging should also be carried out and the images should be available at all future visits to facilitate the detection of optic disc change. Imaging may take the form of standard photography or other modalities such as optical coherence tomography.

Recommendation 13: The NICE Quality Standard 4 states that "people with COAG, suspected COAG or with OHT are diagnosed and have a management plan formulated by a suitably trained healthcare professional with competencies and experience in accordance with NICE guidance". Diagnosis of glaucoma and management plan formulation should be the responsibility of a consultant ophthalmologist. Table 2 summarises these requirements. The CoO Higher Qualifications have been used as an example here, qualifications for optometric and non-optometric HCPs which quality-assure the same NICE CG85 levels of training would be equally acceptable.

Table 2: Recommendations for experience, qualifications and competencies of healthcare professionals involved in care pathways for OHT, suspected glaucoma and glaucoma.

The term competence implies proficiency, i.e. familiarity based on regularly performing and interpreting an examination or procedure.

** Local foundation level or core competence refresher training as provided by LOCSU/WOPEC is widely undertaken in current schemes for some low risk subgroups of patients. Joint College Guidance[6] allows for defined low risk subgroups who do not require treatment to not be referred. Similarly, people not requiring treatment who have been monitored for a period and who have been found to be stable are advised by NICE to attend their optometrist for annual visits (e.g. people with mild OHT and increased CCT). A repeat measures scheme may provide a useful context for observation of these subgroups of low risk individuals who do not require formal monitoring.*

*** Consultant supervision should be in line with the joint college guidance in relation to glaucoma-related care by optometrists.[8] Principles which apply to optometrists should similarly apply to other HCPs.*

	Level I	Level II	Level III	Level IV
Type of Care	Case finding; Repeat measures (IOP/Fields only, optic disc appearance normal) * Observation of individuals not requiring referral (Joint College Guidance[6]) and stable individuals off treatment discharged to annual optometric visits (CG85).	Enhanced Case Finding (IOP and other measures); Monitoring (but not altering the treatment of) people with an established diagnosis and management plan for OHT or suspected glaucoma (Level I activities also permitted)	Diagnosis of OHT/COAG suspect; Management of OHT and suspected glaucoma (Level I & II activities also permitted)	Management of established glaucoma where a diagnosis has been made by a consultant ophthalmologist (or someone working under their supervision**) (Level I,II & III activities also permitted)
Experience / qualification / supervision	Core competence for optometrists	CoO Professional Certificate in Glaucoma, or equivalent. (Prior to this CoO qualification local refresher training and accreditation in common use.)	Specialist qualification (CoO Professional Higher Certificate in Glaucoma, or equivalent, or Glaucoma Certificate A), or working under supervision of a consultant ophthalmologist**	Specialist qualification (CoO Professional Diploma in Glaucoma, or Glaucoma Certificate B), or equivalent, or working under supervision of a consultant ophthalmologist**
Competency and familiarity in performing and interpreting	• Goldmann type applanation tonometry • standard automated perimetry • central supra-threshold perimetry • anterior segment examination	As per Level I, **and**: • experience and ability to detect a change in clinical status from normal to abnormal • slit lamp mounted Goldmann applanation tonometry • stereoscopic slit lamp biomicroscopic examination of the anterior segment • Van Herick's peripheral anterior chamber depth assessment • examination of the posterior segment using slit lamp	As per Level II, **and**: • medical and ocular history • differential diagnosis • gonioscopy • CCT measurement NB. Optometrists working at Level III who *in addition* have prescribing rights (Independent prescribing / supplementary prescribing / patient group directions) may themselves prescribe or supply (initiate or alter) topical treatment for people with OHT / COAG Suspect (fields	As per Level III, **and** should be trained and able to make management decisions on: • risk factors for conversion to glaucoma • coexisting pathology • risk of sight loss • monitoring and clinical status change detection • pharmacology of IOP-lowering medications • advise treatment changes for COAG, COAG suspect status and OHT (with consideration given to relevant contraindications and interactions) NB. Optometrists working at Level IV who *in addition*

	Level I	Level II	Level III	Level IV
		binocular indirect ophthalmoscopy	and discs normal or equivocal). Those without prescribing rights can do so in conjunction with a prescriber.	have prescribing rights may themselves prescribe topical treatment for people with an established diagnosis of COAG.

4.3.5 Monitoring

The NICE Quality Standard 5 states "People diagnosed with COAG, suspected COAG or with OHT are monitored at intervals according to their risk of progressive loss of vision in accordance with NICE guidance". Commissioners should commission services that adhere to NICE guidance for monitoring intervals, as summarised in the following tables.

Recommendation 14: Commissioners should commission services that adhere to NICE guidance for monitoring intervals, as summarised in Tables 3&4.

Table 3: Recommended monitoring intervals for people with OHT or suspected COAG who are 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	N/A	12 to 24
Yes	High	No change in treatment plan	N/A	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

[a] Person is treated and IOP is at or below target. If IOP cannot be adequately controlled medically, refer to consultant ophthalmologist.
[b] To be clinically judged in terms of age, IOP, CCT, appearance and size of optic nerve head.
[c] For change of treatment plan refer to treatment recommendations.
[d] For people started on treatment for the first time check IOP 1 to 4 months after start of medication.

Table 4: Recommended monitoring intervals for people with COAG

Clinical Assessment			Monitoring Intervals (months)	
IOP at target [a]	**Progression [b]**	**Outcome [c]**	**IOP alone [d]**	**IOP, optic nerve head and visual field**
Yes	No [e]	No change in treatment plan	N/A	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	N/A	2 to 6
No	No [e]	Review target IOP or change treatment plan	1 to 2	2 to 6

[a] IOP at or below target.
[b] Progression = increased optic nerve damage and/or visual field change confirmed by repeated test where clinically appropriate.
[c] For change of treatment plan refer to treatment recommendations.
[d] For people started on treatment for the first time check IOP 1 to 4 months after start of medication.
[e] No = not detected or not assessed if IOP check only following treatment change.

Recommendation 15: For people with OHT or suspected COAG who are not recommended to receive medication, NICE clinical guidance recommends assessing IOP, optic nerve head and visual field at the following intervals: between 12 and 24 months if there is a low risk of conversion to COAG; between 6 and 12 months if there is a high risk of conversion to COAG. If no change in the parameters has been detected after 3 to 5 years (depending on perceived risk of conversion), or before if confirmed normal, the person should be discharged from active glaucoma care to community optometric care. Commissioners should commission services accordingly.

Recommendation 16: Commissioners should be aware of the risk of avoidable sight loss when patients miss monitoring appointments, or when appointments are delayed or cancelled. Therefore, commissioners should monitor providers' compliance with the NICE monitoring criteria and should adopt the recommendations provided by the NPSA,[7] with due regard to the source documentation and summaries in this guideline.

4.3.6 Treatment

Recommendation 17: The NICE Quality Standard 6 states that "People with suspected COAG or with OHT are managed based on estimated risk of conversion to COAG and progression to visual impairment using IOP, CCT and age, in accordance with NICE guidance".

Commissioners should ensure that providers adhere to NICE guidance, as summarised in Table 5:

Table 5: Treatment for people with OHT or suspected COAG

CCT	More than 590 microm etres		555–590 microm etres		Less than 555 microm etres		Any
Untreated IOP (mmHg)	> 21 to 25	> 25 to 32	> 21 to 25	> 25 to 32	> 21 to 25	> 25 to 32	> 32
Age (years)[a]	Any	Any	Any	Treat until 60	Treat until 65	Treat until 80	Any
Treatment	No-treatment	No-treatment	No-treatment	PGA[b]	PGA	PGA	PGA

[a] Treatment should not be routinely offered to people over the age threshold unless there are likely to be benefits from the treatment over an appropriate timescale. Once a person being treated for OHT reaches the age threshold for stopping treatment but has not developed COAG, healthcare professionals should discuss the option of stopping treatment.

The use of age thresholds is considered appropriate only where vision is currently normal (OHT with or without suspicion of COAG) and the treatment is purely preventative. Under such circumstances the threat to a person's sighted lifetime is considered negligible. In the event of COAG developing in such a person then treatment is recommended.

[b] NICE recommended beta-blockers (BB) for this subgroup in 2009. At least one PGA has since come 'off patent' and for generic prescribing the cost is now considerably lower. For this reason in this guidance we have switched this subgroup recommendation to a prostaglandin analogue (PGA) which is known to be more clinically effective with less systemic side effects and now available with alternative preservatives and in preservative free formulations.

Recommendation 18: Commissioners should ensure they commission providers that offer treatment for people diagnosed with glaucoma according to NICE clinical guidelines.[1] NICE recommendations include:

- A diagnosis of glaucoma should be established by a consultant ophthalmologist together with formulation of a management plan
- Contra-indications and potential drug interactions should be checked prior to offering medication
- People at risk of significant visual loss in their expected lifetime are offered first line treatment with a prostaglandin analogue
- People prescribed topical medication are encouraged to continue with the same treatment unless: IOP is not sufficiently reduced, the glaucoma has progressed, or they are intolerant to the drug
- For people with insufficient IOP lowering, adherence to treatment and drop instillation technique are checked. If adherence and technique are adequate, one of the following

should be offered: alternative or additional pharmacological treatment (more than one medication may be required), laser trabeculoplasty, or surgery (see below)

- For people intolerant to prescribed medication, consider offering an alternative medication or a preservative free preparation if there is evidence that the person is allergic to or intolerant of preservatives. After trying two or more pharmacological regimens (which may include combinations), consider offering laser trabeculoplasty or surgery.

Recommendation 19: The NICE Quality Standard 10 states that "people with COAG who are progressing to loss of vision despite treatment or who present with advanced visual loss are offered surgery with pharmacological augmentation (for example, mitomycin-C [MMC] or 5-Fluorouracil [5FU]) as indicated, and provided with information on the risks and benefits associated with surgery". Commissioners should ensure they commission services that offer surgery, with augmentation as appropriate, as detailed in the NICE glaucoma guideline and quality standard.

Recommendation 20: Commissioners should also note NICE guidance regarding new emerging surgical treatments and ensure they commission providers that are compliant with this guidance.

Recommendation 21: The NICE Quality Standard 7 states that "people with COAG, suspected COAG or with OHT have a regular review of management options with their healthcare professional, taking into account comorbidity and other changed circumstances, including a discussion of the benefits and risks of stopping treatment for those at low risk of progressing to visual impairment". Commissioners should ensure they commission services that discuss cessation of therapy with people who have an acceptable IOP and have a low risk of developing visual impairment in their expected lifetime. If therapy is stopped, an IOP check should be offered in 1 to 4 months' time and further monitoring if considered clinically necessary.

4.3.7 Follow-up and discharge

Recommendation 22: The NICE Quality Standard 8 states that "people diagnosed with COAG, suspected COAG or with OHT have access to timely follow-up appointments and specialist investigations at intervals in accordance with NICE guidance. Sufficient capacity is put in place to provide this service, and systems are developed to identify people needing clinical priority if appointments are cancelled, delayed or missed". Commissioners should ensure they commission providers with sufficient capacity to meet the local clinical demand; tools discussed in section 2 may assist commissioners in estimating local needs.

Recommendation 23: Commissioners should ensure that patient focused mechanisms are in place to track appointments, which is of particular importance where integrated services straddle the hospital-community boundary. Commissioners should also ensure that patients with clinical priority are clearly identifiable and if their appointment is cancelled, missed or delayed that measures are in place to ensure that their appointment takes place within an appropriate time frame. Commissioners should ensure they commission services that are compliant with the NPSA recommendations listed in section 1.3.5.[7]

Recommendation 24: Commissioners should be aware that transport services to the hospital or community setting may be required for some patients to ensure appointments are not missed.

Recommendation 25: Commissioners should ensure that they are aware that provider DNA policies may need to be amended for patients with glaucoma given the risk of preventable blindness. All missed appointments should be risk-assessed and appropriate action taken. Automatic discharge following a missed appointment is usually not appropriate. Letters following up missed appointments should be sent to the patient in accessible formats (i.e. in the format they require) as well as to the GP. Particular caution is needed in the context of people with learning difficulties and DNAs should be followed up with the patient's GP and care facility where relevant.

Recommendation 26: The NICE Quality Standard 12 states that "people with suspected COAG or with OHT who are not recommended for treatment and whose condition is considered stable are discharged from formal monitoring with a patient-held management plan". Commissioners should ensure they commission services that are compliant with NICE clinical guidelines,[1] including:

- If people with OHT or suspected COAG have had no changes in parameters for IOP, visual fields and optic nerve head and are not recommended to receive medication, they are discharged from the glaucoma care pathway after 3-5 years (depending on the perceived risk of conversion to glaucoma) or sooner if confirmed normal
- People who are discharged should see a community optometrist qualified to carry out enhanced case finding (Level II, Table 2) annually, or at the recommended interval, with a patient-held management plan so that any future changes can be detected. These tests are not covered by the current GOS contract and should be commissioned. Where established community schemes exist, annual testing of such individuals could be incorporated within the scheme.

4.3.8 Training and Workforce

Recommendation 27: Commissioners should:

- Explore the availability of community optometrists who are able to provide enhanced case finding, referral refinement, community monitoring of OHT and Suspected COAG and community management of OHT and Suspected COAG (normal visual fields – See Table 1a&b).
- Estimate the demand for training among local community optometrists to become competent at enhanced case finding, referral refinement and community monitoring of OHT and Suspected COAG and community management of OHT and Suspected COAG.
- Where availability of suitably trained community optometrists to undertake these roles is poor and demand for training exits, commissioners should support initiatives which encourage optometrists to undertake the training required to deliver these community services. Funding may be required for delivery of training.
- Explore the availability of other potentially competent providers of enhanced case finding, referral refinement and community management of OHT and Suspected COAG such as community-based ophthalmology practices.

4.3.9 Primary angle-closure glaucoma (PACG)

Recommendation 28: Where a narrow and potentially closable angle is suspected, timely onward referral should be made. In the presence of either acute or sub-acute angle closure with elevated IOP, either an emergency or urgent HES referral should be made depending on the clinical circumstances.

Recommendation 29: Commissioners should ensure they commission services which:

- Specify that all people seen at their first visit for diagnosis in referral refinement, community-based ophthalmology, or the HES undergo peripheral anterior chamber depth assessment and gonioscopy to identify angle-closure. Referral refinement schemes should offer peripheral anterior chamber depth assessment by gonioscopy (Table 2, Level III).
- Discuss the option of LPI with primary angle-closure suspects to potentially reduce the risk of angle-closure and glaucoma. The evidence for benefit is currently uncertain and the risks and benefits of LPI should be discussed with each patient. If the patient opts for observation rather than LPI, they should be fully informed regarding the symptoms of a possible acute angle-closure attack and be aware that emergency treatment in the HES would be necessary should this occur.
- Offer LPI to people with primary angle-closure (PAS or elevated IOP) or primary angle-closure glaucoma (disc &/or field damage). LPI should be carried out by an ophthalmologist or healthcare professional with suitable qualification, training and experience. LPI should be carried out according to a protocol which may be based on the preferred practice pattern.[27]
- Offer lens extraction as an alternative to LPI for people with primary angle-closure or primary angle-closure glaucoma and coexistent cataract. LPI may be required in advance of cataract surgery to avoid acute angle closure when pilocarpine treatment is discontinued and pupils are dilated pre-operatively.
- Provide information to patients regarding which topical, inhaled or systemic medications are contraindicated in their condition.

Recommendation 30: Regarding the treatment of acute-angle closure, commissioners should ensure they commission services which:

- Have 24-hour emergency access to the HES, or have an agreement in place with another service to provide this service
- Have processes in place for efficient emergency referral from the community to the HES
- Have a protocol for the management of acute angle-closure that is compliant with the preferred practice pattern[27]
- Ensures patients are not discharged without prophylactic laser therapy to the fellow eye unless contraindicated.

4.3.10 Secondary glaucoma

Recommendation 31: Commissioners should ensure they commission services that:

- Adhere to COAG guidelines for patients with pseudoexfoliative or pigmentary glaucoma, whilst at the same time recognising that variations in treatment may be clinically necessary for these subgroups
- Ensure patients with complex forms of secondary glaucoma are managed within or in collaboration with the HES.
- Ensure that arrangements for specialist treatments such as diode laser cyclophotocoagulation and anti-VEGF are available either locally or through onward specialist referral.

4.4 Non-traditional therapies for glaucoma

A recent Cochrane review did not find good evidence to support the role of acupuncture in the management of glaucoma.[31] The current evidence search did not find good evidence for other non-traditional therapies such as Ginkgo biloba.

4.5 Adherence to glaucoma medication

Recommendation 32: It is recommended that effective patient education be delivered as part of an ECLO service, as described in this guideline. Box 1 details important components of information provision for patients.

4.6 Generic medication

Recommendation 33: Commissioners should recommend the use of generic medication where appropriate, given the potential cost savings. However, commissioners should be aware that:

- If a patient with stable glaucoma is tolerating a branded medication well, it may not be appropriate or cost-effective to switch to a generic version of that medication.
- The different appearance of the bottle may cause confusion, especially with the visually impaired, and the bottle may not be as easy for the patient to use.
- Switching to a generic medication may prompt extra monitoring visits – there will be costs associated with this
- Patients should receive instruction on the correct use of eye drop administration aids.
- Patients may need different eye drop administration aids if their drops are changed because generic bottles are not necessarily the same size, rigidity nor shape and may not fit their present aid
- Any adverse events observed on switch to a generic medication should be reported through the yellow-card system.

5. Commissioning & costing tools

Recommendation 34: Risk stratification is key to appropriate commissioning and commissioners are advised to download and use the cost impact and commissioning assessment for implementing the NICE Glaucoma Quality Standard published by NICE.[35]

Recommendation 35: An integrated approach to the patient pathway is advised for both those people newly identified with glaucoma as well as those at risk of future development of glaucoma. In most areas, community resources are insufficiently developed in terms of NICE recommended competencies, qualifications and experience for commissioning of services for higher risk patients outside of the HES. However, repeat measures schemes and enhanced case finding schemes should be, and referral refinement schemes may be, community based where local health care providers with appropriate skills and competencies are available in community settings (Tables 1 & 2).

6. Levers for Implementation are tools for commissioners and providers to aid implementation of high value care pathways.

6.1 Audit and Peer Review Measures

Recommendation 36: Commissioners should be aware that NICE has provided a range of Quality Standards which can be audited and used by providers to demonstrate the quality of their services (http://www.nice.org.uk/guidance/QS7/chapter/Introduction-and-overview)

In addition to the NICE Quality Standards, Statements, and Measures the GDG considered some further items to be relevant to service quality and of potential value to commissioners (Table 6).

Table 6: Standards relevant to service quality in addition to NICE Quality Standards

Standard	Description	Data Specification
Proportion of new referrals seen in the Hospital Eye Service originating from the community with written feedback of the visit examination and outcome sent to the referring community HCP.	Evidence of systematic written feedback to community optometrists and other HCPs involved in the care of patients with glaucoma or OHT.	*Numerator* – the number of people in the denominator with evidence of written communication to their community HCP (other than their GP) from the Hospital Eye Service *Denominator* – the number of new referrals originating from the community seen in the Hospital Eye Service for suspected glaucoma or OHT.
Proportion of referrals seen in the Hospital Eye Service with minimum dataset details in the referral communication.	Evidence that Hospital Eye Services are only accepting people with adequately detailed referrals.	*Numerator* – the number of people in the denominator with all the minimum dataset details (locally determined) in the referral communication *Denominator* – the number of new referrals originating from the community seen in the Hospital Eye Service for suspected glaucoma or OHT.
Proportion of people eligible for sight impairment certification who are offered certification.	Evidence that people entitled to sight impairment certification are offered certification	*Numerator* – the number of people in the denominator who have written documentation of a discussion relating to the possibility of certification Denominator – the number of people seen in the Hospital Eye Service with glaucoma who meet the criteria for sight impairment.
Proportion of people with suspected COAG from community optometry have a further assessment before consultant ophthalmologist referral (NICE quality statement 12)	Evidence of arrangements for referral refinement	Proportion of people in whom an optometrist or other healthcare professional suspects COAG who undergo further assessment with referral refinement. *Numerator* – the number of people in the denominator who undergo further assessment with referral refinement.
Proportion of people undergoing referral refinement that are subsequently referred to	An efficient referral refinement service	Proportion of people who undergo referral refinement who are subsequently referred on to a

a consultant ophthalmologist (NICE quality statement 1[2])		consultant ophthalmologist for definitive diagnosis because COAG is suspected. *Numerator* – the number of people in the denominator who are referred to a consultant ophthalmologist for definitive diagnosis. *Denominator* – the number of people undergoing referral refinement because COAG is suspected.
People with elevated IOP alone are referred to an appropriately qualified healthcare professional for further assessment on the basis of perceived risk of progression to COAG. There are agreements in place for repeat measures. (NICE quality statement 2[2])	Evidence of repeat measures service for people suspected of glaucoma solely due to raised IOP	Proportion of people with elevation of IOP alone, who are referred for repeat measures to an appropriately qualified healthcare professional. *Numerator* – the number of people in the denominator referred for repeat measures to an appropriately qualified healthcare professional. *Denominator* – the number of people with suspected elevation of IOP alone.
People referred for definitive diagnosis in the context of possible COAG or with OHT receive all relevant tests in accordance with NICE guidance (see section 1.3.4) (NICE quality statement 3[2]).	People referred for a definitive diagnosis have all the tests specified by NICE guidance	Proportion of people referred for definitive diagnosis in the context of possible COAG or with OHT who attend and receive all relevant tests in accordance with NICE guidance. *Numerator* – the number of people in the denominator receiving all relevant tests in accordance with NICE guidance. *Denominator* – the number of people attending an appointment following a referral for definitive diagnosis in the context of possible COAG or with OHT.
People with COAG, suspected COAG or with OHT are diagnosed and have a management plan formulated by a suitably trained healthcare professional with competencies and experience in accordance with NICE guidance (see section 1.3.4) (NICE quality statement 4[2]).	Suitably trained healthcare professionals are making the definitive diagnosis and management plan for patients.	a) Proportion of people with COAG, suspected COAG or with OHT who are diagnosed by a suitably trained healthcare professional with competencies and experience in the relevant condition in accordance with NICE guidance. *Numerator* – the number of people in the denominator diagnosed by a suitably trained healthcare professional with competencies and experience in the relevant condition in accordance with NICE guidance. *Denominator* – the number of people with COAG, suspected COAG or with OHT. b) Proportion of people with COAG, suspected COAG or with OHT who have a management plan formulated by a healthcare professional with competencies and experience in the relevant condition in accordance with NICE guidance. *Numerator* – the number of people in the denominator with a management plan formulated by a healthcare professional with competencies and

		experience in the relevant condition in accordance with NICE guidance. *Denominator* – the number of people with COAG, suspected COAG or with OHT
People diagnosed with COAG, suspected COAG or with OHT are monitored at intervals according to their risk of progressive loss of vision in accordance with NICE guidance (see section 1.3.5) (NICE quality statement 5[2]).	Suitable follow-up intervals to minimise risk of progressive vision loss.	Proportion of people with COAG, suspected COAG or with OHT who are monitored at intervals according to their risk of progressive loss of vision in accordance with NICE guidance. *Numerator* – the number of people in the denominator monitored at intervals according to their risk of progressive loss of vision in accordance with NICE guidance. *Denominator* – the number of people diagnosed with COAG, suspected COAG or with OHT.
People with suspected COAG or with OHT are managed based on estimated risk of conversion to COAG and progression to visual impairment using IOP, CCT and age, in accordance with NICE guidance (see section 1.3.6) (NICE quality statement 6[2]).	Ensuring cost-effective management of people with suspected COAG or with OHT.	a) Proportion of people diagnosed with suspected COAG or with OHT who are assessed for treatment eligibility based on estimated risk of conversion to COAG and progression to visual impairment using IOP, CCT and age. *Numerator* – the number of people in the denominator assessed for treatment eligibility based on estimated risk of conversion to COAG and progression to visual impairment using IOP, CCT and age. *Denominator* – the number of people diagnosed with suspected COAG or with OHT. b) Proportion of people diagnosed with suspected COAG or with OHT who are eligible and who are offered treatment based on estimated risk of conversion to COAG and progression to visual impairment using IOP, CCT and age, who are managed in accordance with NICE guidance. *Numerator* – the number of people in the denominator managed in accordance with NICE guidance. *Denominator* – the number of people diagnosed with suspected COAG or with OHT who are eligible for treatment based on estimated risk of conversion to COAG and progression to visual impairment using IOP, CCT and age. c) Proportion of people diagnosed with suspected COAG or with OHT at low risk of progressing to visual impairment who receive no treatment in accordance with NICE guidance. *Numerator* – the number of people in the denominator who receive no treatment in accordance with NICE guidance. *Denominator* – the number of people diagnosed with suspected COAG or with OHT at low risk of

		progressing to visual impairment for whom treatment is not recommended by NICE guidance.
People with COAG, suspected COAG or with OHT have a regular review of management options with their healthcare professional, taking into account comorbidity and other changed circumstances, including a discussion of the benefits and risks of stopping treatment for those at low risk of progressing to visual impairment. (NICE quality statement 7[2]).	Evidence of arrangements to ensure that people with chronic open angle glaucoma (COAG), suspected COAG or with ocular hypertension (OHT) have a regular review of management options with their healthcare professional, taking into account comorbidity and other changed circumstances, including a discussion of the benefits and risks of stopping treatment for those at low risk of progressing to visual impairment.	a) Proportion of people with COAG, suspected COAG or with OHT who have a regular review of management options with their healthcare professional taking into account comorbidity and other changed circumstances. *Numerator* – the number of people in the denominator having a regular review of management options with their healthcare professional taking into account comorbidity and other changed circumstances. *Denominator* – the number of people with COAG, suspected COAG or with OHT. b) Proportion of people with COAG, suspected COAG or with OHT at low risk of progressing to visual impairment who have a discussion of the benefits and risks of stopping treatment. *Numerator* – the number of people in the denominator participating in a discussion of the benefits and risks of stopping treatment. *Denominator* – the number of people with COAG suspected COAG or with OHT at low risk of progressing to visual impairment.
People diagnosed with COAG, suspected COAG or with OHT have access to timely follow-up appointments and specialist investigations at intervals in accordance with NICE guidance. Sufficient capacity is put in place to provide this service, and systems are developed to identify people needing clinical priority if appointments are cancelled, delayed or missed. (NICE quality statement 8[2]).	a) Evidence of arrangements to ensure people diagnosed with chronic open angle glaucoma (COAG), suspected COAG or with ocular hypertension (OHT) have access to timely follow-up appointments and specialist investigations in accordance with NICE guidance. b) Evidence of arrangements to ensure sufficient capacity is put in place to provide this service and systems are developed to identify people needing clinical priority if appointments are cancelled, delayed or missed.	a) Proportion of people with COAG, suspected COAG or with OHT who have access to timely follow-up appointments and specialist investigations at appropriate intervals in accordance with NICE guidance. *Numerator* – the number of available appointments and specialist investigations for people with COAG, suspected COAG or with OHT. *Denominator* – the number of requested appointments and specialist investigations for people with COAG, suspected COAG or with OHT. b) Proportion of people with COAG, suspected COAG or with OHT, whose appointment has been cancelled, delayed or missed who have their clinical priority assessed. *Numerator* – the number of people in the denominator with a clinical priority assessment. *Denominator* – the number of people with COAG, suspected COAG or with OHT and a cancelled, delayed or missed appointment. c) Proportion of people with COAG, suspected COAG or with OHT whose cancelled, delayed or missed appointment is rescheduled within an appropriate time interval (e.g. one month). *Numerator* – the number of people in the denominator with a rescheduled appointment

		following a cancelled, delayed or missed appointment within an appropriate time interval. *Denominator* – the number of people with COAG, suspected COAG or with OHT with a cancelled, delayed or missed appointment.
Healthcare professionals involved in the care of a person with COAG, suspected COAG or with OHT have appropriate documentation and records available at each clinical encounter in accordance with NICE guidance. (NICE quality statement 9[2]).	Evidence of arrangements to ensure that healthcare professionals involved in a person's care have appropriate documentation available at each clinical encounter in accordance with NICE guidance.	Proportion of people with chronic open angle glaucoma (COAG), suspected COAG or with ocular hypertension (OHT) whose documentation and records are available to healthcare professionals at each clinical encounter. *Numerator* – the number of people in the denominator whose documentation and records are available to the healthcare professional(s) present. *Denominator* – the number of people with COAG, suspected COAG or with OHT attending a clinic appointment.
People with COAG who are progressing to loss of vision despite treatment or who present with advanced visual loss are offered surgery with pharmacological augmentation (for example, MMC or 5FU) as indicated and information on the risks and benefits associated with surgery. (NICE quality statement 10[2]).	Evidence of arrangements to ensure that all people with chronic open angle glaucoma (COAG) who are progressing to loss of vision despite treatment or who present with advanced visual loss are offered surgery with pharmacological augmentation.	a) Proportion of people with COAG who are progressing to loss of vision despite treatment or who present with advanced visual loss who are offered surgery with pharmacological augmentation (for example, MMC or 5FU) as indicated. *Numerator* – the number of people in the denominator offered surgery with pharmacological augmentation (for example, MMC or 5FU) as indicated. *Denominator* – the number of people with COAG progressing to loss of vision despite treatment or who present with advanced visual loss. b) Proportion of people with COAG offered surgery because they are progressing to loss of vision despite treatment or who present with advanced visual loss, who receive information on the risks and benefits associated with surgery. *Numerator* – the number of people in the denominator who receive information on the risks and benefits associated with surgery. *Denominator* – the number of people with COAG who are offered surgery because they are progressing to loss of vision despite treatment or who present with advanced visual loss.
People with COAG, suspected COAG or with OHT are given the opportunity to discuss their diagnosis, prognosis and management, and are provided with relevant and accessible information and advice at initial and subsequent	Evidence of arrangements to ensure that people with chronic open angle glaucoma (COAG), suspected COAG or with ocular hypertension (OHT) are given the opportunity to discuss their diagnosis, prognosis and management, and are	Proportion of people with COAG, suspected COAG or with OHT who are given the opportunity to discuss their diagnosis, prognosis and management and who are provided with relevant and accessible information and advice at initial and subsequent visits in accordance with NICE guidance. *Numerator* – the number of people in the denominator given the opportunity to discuss their diagnosis, prognosis and management and provided with relevant and accessible information and advice

visits in accordance with NICE guidance. (NICE quality statement 11[2]).	provided with relevant and accessible information and advice at initial and subsequent visits in accordance with NICE guidance.	at initial and subsequent visits in accordance with NICE guidance. *Denominator* – the number of people with COAG, suspected COAG or with OHT.
People with suspected COAG or with OHT who are not recommended for treatment and whose condition is considered stable are discharged from formal monitoring with a patient-held management plan (NICE quality statement 12[2]).	Evidence of arrangements to ensure that all people with suspected chronic open angle glaucoma (COAG) or with ocular hypertension (OHT) who are not recommended for treatment and whose condition is considered stable are discharged from formal monitoring with a patient-held management plan.	Proportion of people with suspected COAG or with OHT who are not recommended for treatment and whose condition is considered stable who are discharged from formal monitoring with a patient-held management plan. *Numerator* – the number of people in the denominator discharged from formal monitoring with a patient-held management plan. *Denominator* – the number of people with suspected COAG or with OHT who are not recommended for treatment and whose condition is considered stable.

6.2 Quality Specification / CQUIN

Recommendation 37: Commissioners should develop CQUINs in joint discussion with providers, and the content of CQUINs are best decided locally. The CQUIN may contain goals related to staged implementation of a new process as well as goals related to performance. The outcome of non-achievement of any stages should also be jointly discussed and agreed upon.

7. Directory

7.1 Patient Information for glaucoma

Table 7: Links to patient information and shared decision making tools

Name	Publisher	Link
Diagnosing and treating glaucoma and raised eye pressure	NICE	http://publications.nice.org.uk/diagnosing-and-treating-glaucoma-and-raised-eye-pressure-ifp85
	International Glaucoma Association	www.glaucoma-association.com Tel: 01233 64 81 70
	Royal National Institute of Blind People (RNIB)	www.rnib.org.uk www.rnib.org.uk/eye-health-eye-conditions-z-eye-conditions/glaucoma Tel: 0303 123 9999
	NHS Choices	http://www.nhs.uk/conditions/glaucoma
	Seeability	https://www.seeability.org/

7.2 Clinician Information for glaucoma

Table 8: Links to clinical guidelines, decision support tools

Name	Publisher	Link
Diagnosis and management of chronic open angle glaucoma and ocular hypertension	NICE	http://guidance.nice.org.uk/CG85
Glaucoma Quality Standard	NICE	http://guidance.nice.org.uk/QS7
Glaucoma Pathway	NICE	http://pathways.nice.org.uk/pathways/glaucoma
Guidance on Supervision in relation to Glaucoma-related Care by Optometrists	RCOphth / CoO	https://www.rcophth.ac.uk/professional-resources/glaucoma/
Guidance on the referral of glaucoma suspects by community optometrists	RCOphth / CoO	https://www.rcophth.ac.uk/professional-resources/glaucoma/
Glaucoma Repeat Readings & OHT Monitoring Community Service Pathway	LOCSU	http://www.locsu.co.uk/uploads/enhanced_pathways_2013/locsu_glaucoma_repeat_readings_and_oht_monitoring_pathway_rev_nov_2013.pdf

7.3 NHS Evidence Case Studies for glaucoma

Table 9: Links to examples of good practice

Name	Publisher	Link
Avoiding unnecessary referral for glaucoma: use of a repeat measurement scheme	NHS Evidence Quality, Innovation, Productivity and Prevention	https://www.evidence.nhs.uk/topic/glaucoma?om=%5B%7B%22srn%22%3A%5B%22%20qipp%20%22%5D%7D%5D

8. Benefits and risks of implementing this guidance

Table 10: Benefits and risks of implementing this guidance.

Consideration	Benefit	Risk
Patient outcome	Less avoidable vision loss Less cancelled appointments Well informed patients	Added pressure on eye care service capacity
Patient safety	Reduced risk of loss to follow-up	Some patients may not benefit from treatment
Equality of access	More care in the community will increase equity of access	Insufficient numbers of qualified and experienced HCPs to cater for demand. Deprived areas are poorly served by optometric practices which may increase inequalities
Resource impact	Savings associated with reducing unnecessary hospital referrals	Cost of referral refinement / repeated measures schemes

9. Further information

9.1 Research Recommendations based on Uncertainties

- A review of patient reported outcome measures for glaucoma revealed that most of the instruments had poor developmental quality.[40] More research is required into patient relevant outcomes in glaucoma.
- Development of local registers of glaucoma patients who attend general practices would facilitate integrated patient care between community and hospital, efficient monitoring of patient follow-up to help ensure loss of vision secondary to missed appointments does not occur, assessment of glaucoma prevalence and incidence in the region, more informed and accurate service planning and specification, and easier audit on a region-wide scale. Feasibility research and pilot schemes in this area are needed to evaluate benefits and facilitate uptake of glaucoma registers as appropriate. Furthermore, electronic patient record developers should be encouraged to develop exportable packages for register capability.
- Uncertainty remains regarding relative real-world efficacy and adverse reactions of generic versus branded medications.
- The relative cost-effectiveness of repeat measures and referral refinement schemes should be further examined and the role of new ocular imaging devices in referral refinement investigated.
- The relative cost effectiveness of community vs. hospital based monitoring and management of people with an established diagnosis of COAG, Suspected COAG or OHT for various strata of case complexity would facilitate rational service development strategies.
- A greater understanding of why patients miss appointments may reduce loss to follow-up and avoidable blindness.
- Further research is required to identify successful approaches to optimising patient adherence to therapy, such as motivational techniques and community pharmacist interventions.

9.2 Other Recommendations

Recommendation 38: Commissioners should be aware of the following further recommendations for efficient commissioning of glaucoma services:

- Commissioners should explore commissioning model options according to their local population need, ensuring that patient choice and procurement regulations are met. They could consider a “Prime Provider” or more collaborative “Alliance Model”. The financial model also needs consideration. One option is a Programme Budget approach, inclusive of Community and Secondary Care spend, which encompasses the entire patient pathway; this would drive the patient to be seen by the right person at the right time in the right place.
- Commissioners should consider a glaucoma register with diagnostic and patient visit information to reduce the risks associated with loss to follow up. Failsafe approaches are especially relevant where services are distributed across hospital / community boundaries.
- Commissioners should commission glaucoma services for a reasonable amount of time (e.g. five years). Glaucoma care is very different from cataract care, for example. Cataract services treat people for a short, defined period of time and then discharge people from their care.

Glaucoma patients, once diagnosed, are usually treated for life. On average, glaucoma affects people for 15 years. Continuity of care is important and a change of provider may disrupt this.

- Commissioners should consider making accessible a listing of local community optometrists with higher level glaucoma qualifications (Table 2) for the benefit of patients who wish to see a community optometrist who has experience with glaucoma patients.
- Inclusion of Glaucoma and related conditions in the 'New Medicines Service' should be considered as this would bring benefits in terms of getting patients correctly established on treatment early on in the course of their condition www.nhs.uk/NHSEngland/AboutNHSservices/pharmacists/Pages/medicine-service-qa.aspx.
- Commissioners should be working alongside Health Education England to ensure future provision of an appropriately qualified workforce.

9.3 Evidence Base

A systematic review of the literature was undertaken. The Guideline Development Group came to a consensus on the topics and questions for the search, formulated in a PICO structure if appropriate. The systematic search was undertaken by Bazian Ltd on 15th October 2013 and included the Cochrane Libraries, MEDLINE, EMBASE, NHS Evidence – guidelines, NHS Evidence – commissioning, National Guidelines Clearing House, Google and other grey literature including the Royal College of Ophthalmologists and College of Optometrists' websites. See the Commissioning Guide: Glaucoma Long Version.

9.4 Guideline Development Group

GDG Member	Designation
Professor John Sparrow (Chair)	Consultant Ophthalmologist, University Hospitals Bristol NHS Foundation Trust and The Royal College of Ophthalmologists
Ms Jane Bell	Local Optical Committee Support Unit, and community optometrist
Mr Daniel Byles	Consultant Ophthalmologist, The Royal Devon and Exeter NHS Foundation Trust and The Royal College of Ophthalmologists
Dr Timothy Crook	GP, Senior Partner Rother House Medical Centre, Stratford upon Avon
Ms Clara Eglan	Royal National Institute of Blind People
Mr Anthony Khawaja	Specialist Registrar in Ophthalmology, Moorfields Eye Hospital NHS Foundation Trust
Mr Simon Longstaff	Consultant Ophthalmologist, Sheffield Teaching Hospitals NHS Foundation Trust
Mr David Parkins	Assistant Director of Quality, Bexley Clinical Commissioning Group
Ms Mary-Ann Sherratt	Optometrist, University Hospitals Bristol NHS Foundation Trust and the College of Optometrists
Mr Richard Smith	Consultant Ophthalmologist, Buckinghamshire Healthcare NHS Trust and The Royal College of Ophthalmologist
Professor Stephen Vernon	Consultant Ophthalmologist, Nottingham University Hospitals NHS Trust and The Royal College of Ophthalmologists
Mrs Lucy Titcomb	Pharmacist, UK Ophthalmic Pharmacy Group
Mrs Christine Wall	Lay Advisory Group, The Royal College of Ophthalmologists
Professor Heather Waterman	School of Nursing, Midwifery and Social Work. The University of Manchester
Mr Richard Wormald	Consultant Ophthalmologist, Head of Epidemiology, Moorfields Eye Hospital and The Royal College of Ophthalmologists
Ms Maxine Wright	Team Manager, Sensory team, Hampshire County Council
Mr Russell Young	International Glaucoma Association

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- The Royal College of Ophthalmologists
- Nottingham University Hospitals NHS Trust (under £10,000)

9.6 Conflict of Interest Statement

Individuals involved in the development and formal peer review of commissioning guidance are asked to complete a conflict of interest declaration. It is noted that declaring a conflict of interest does not imply that the individual has been influenced by his or her interest. It is intended to ensure interests (financial or otherwise) are transparent and allow other to have knowledge of that interest.

The following interests have been declared by this Group:

- Ms Jane Bell is a LOCSU Clinical Advisor and a member of the Board of Director of the Association of Optometrists.
- Dr Timothy Crook is Partner in Circle Health.
- Mr Simon Longstaff has in the past received consultancy fees from Allergan and Alcon as part for advisory board work.
- Mr David Parkins is president of the College of Optometrists
- The Royal National Institute of Blind People receives money from pharmaceutical companies in the form of educational grants. In recent years we have been supported by Novartis, Allergan, Alcon, and Bayer for initiatives such as the provision of Eye Clinic Liaison Officers in eye clinics. The funding is declared in RNIB's annual report and each year the support given by pharmaceutical companies represents less than 0.001% of our overall funding.
- Ms Mary-Ann Sherratt is president elect of the College of Optometrists
- Professor John Sparrow was Chair of the NICE Glaucoma Guideline Development Group and Chair of the NICE Quality Standard Topic Expert Group
- Mr Russell Young was previously employed by MSD (retired in 2009).

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