NICE National Institute for Health and Care Excellence

NICE Pathways

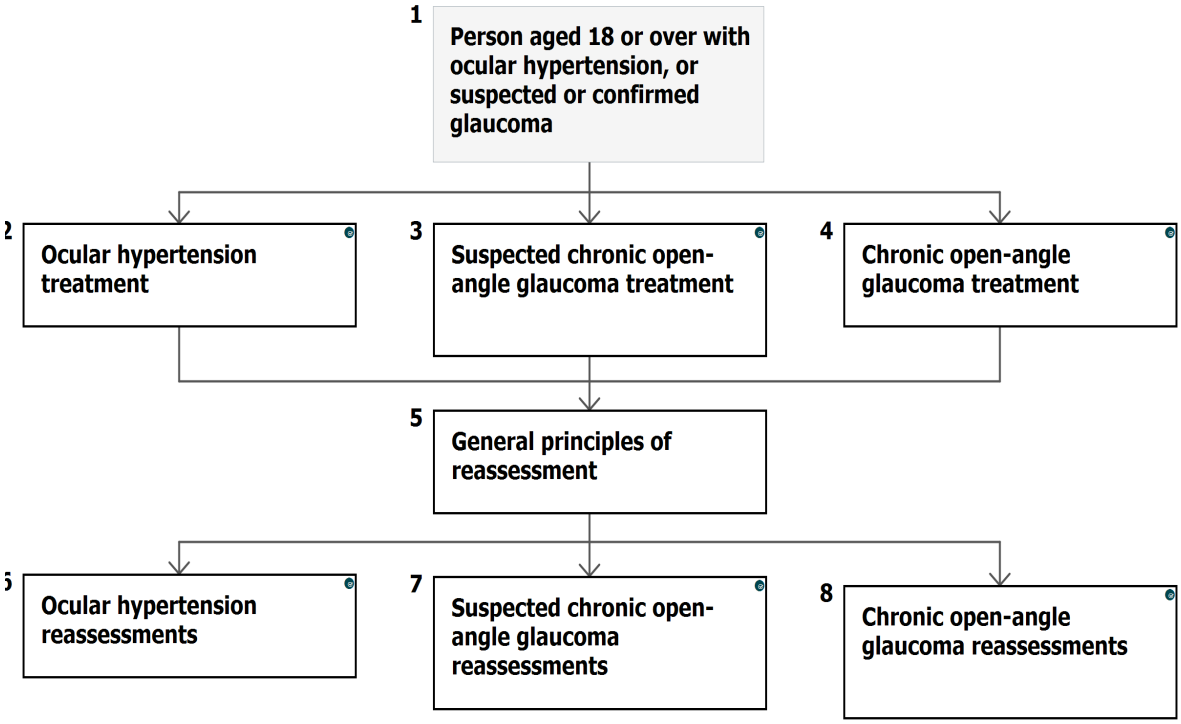
Managing glaucoma

NICE Pathways bring together all NICE guidance, quality standards and other NICE information on a specific topic.

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

http://pathways.nice.org.uk/pathways/glaucoma
Pathway last updated: 31 October 2017

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



1 Person aged 18 or over with ocular hypertension, or suspected or confirmed glaucoma

No additional information

2 Ocular hypertension treatment

Take into account any cognitive and physical impairments when making decisions about management and treatment.

Check that there are no relevant comorbidities or potential drug interactions before offering pharmacological treatment.

Offer a generic PGA[1] to people with IOP of 24 mmHg or more (OHT) if they are at risk of visual impairment within their lifetime (see diagnosis for how to assess this risk).

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

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

Offer a drug from another therapeutic class (beta-blocker, carbonic anhydrase inhibitor[2] or sympathomimetic) to people with an IOP of 24 mmHg or more whose current treatment is not reducing IOP sufficiently to prevent the risk of progression to sight loss. Topical drugs from different therapeutic classes may be needed at the same time to control IOP.

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

NICE has published an evidence summary on glaucoma: brinzolamide/brimonidine combination eye drops.

[1] At the time of publication (November 2017), not all generic PGAs had a UK marketing authorisation for first-line treatment. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the GMC's Prescribing guidance: prescribing unlicensed medicines for further information.

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

When to refer to a consultant ophthalmologist

Refer people whose IOP cannot be reduced sufficiently with pharmacological treatment to prevent the risk of progression to sight loss to a consultant ophthalmologist to discuss other options.

Stopping treatment

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

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

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

Quality standards

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

6. Management based on estimated risk of conversion to COAG and progression to visual impairment

7. Stopping treatment

3 Suspected chronic open-angle glaucoma treatment

Take into account any cognitive and physical impairments when making decisions about management and treatment.

Check that there are no relevant comorbidities or potential drug interactions before offering pharmacological treatment.

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

Offer a generic PGA[1] to people with suspected COAG and IOP of 24 mmHg or more, in line with the recommendations on OHT treatment [See page 3].

[1] At the time of publication (November 2017), not all generic PGAs had a UK marketing authorisation for first-line treatment. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the GMC's Prescribing guidance: prescribing unlicensed medicines for further information.

Stopping treatment

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

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

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

Quality standards

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

6. Management based on estimated risk of conversion to COAG and progression to visual impairment

7. Stopping treatment

4 Chronic open-angle glaucoma treatment

Take into account any cognitive and physical impairments when making decisions about management and treatment.

Check that there are no relevant comorbidities or potential drug interactions before offering pharmacological treatment.

Offer a generic PGA[1] to people with COAG.

Offer people with advanced COAG, surgery with pharmacological augmentation (MMC[2]) as indicated. Offer them information on the risks and benefits associated with surgery.

Offer people who present with advanced COAG and who are listed for surgery, interim treatment with a generic PGA.

Encourage people to continue with the same pharmacological treatment unless:

- their IOP cannot be reduced sufficiently to prevent the risk of progression to sight loss
- there is progression of optic nerve head damage

[1] At the time of publication (November 2017), not all generic PGAs had a UK marketing authorisation for first-line treatment. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the GMC's Prescribing guidance: prescribing unlicensed medicines for further information.

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

- there is progression of visual field defect
- they cannot tolerate the drug.

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

- a drug from another therapeutic class (a beta-blocker, carbonic anhydrase inhibitor[1] or sympathomimetic); topical drugs from different therapeutic classes may be needed at the same time to control IOP
- laser trabeculoplasty
- surgery with pharmacological augmentation (MMC) as indicated.

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

Offer surgery with pharmacological augmentation (MMC) as indicated to people with COAG who are at risk of progressing to sight loss despite treatment. Offer them information on the risks and benefits associated with surgery.

Consider offering people with COAG who cannot tolerate a treatment:

- a drug from another therapeutic class (a beta-blocker, carbonic anhydrase inhibitor or sympathomimetic) or
- preservative-free eye drops if there is evidence that the person is allergic to the preservative or has clinically significant and symptomatic ocular surface disease.

After trying drugs from 2 therapeutic classes, consider offering surgery with pharmacological augmentation (MMC) as indicated or laser trabeculoplasty.

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

- pharmacological treatment; topical drugs from different therapeutic classes may be needed at the same time to control IOP
- further surgery
- laser trabeculoplasty or cyclodiode laser treatment.

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

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

- pharmacological treatment; topical drugs from different therapeutic classes may be needed at the same time to control IOP
- laser trabeculoplasty or cyclodiode laser treatment.

See NICE's recommendations on preoperative tests.

NICE has published an evidence summary on glaucoma: brinzolamide/brimonidine combination eye drops.

Interventional procedures

NICE has published guidance on the following procedures with **normal or standard arrangements** for clinical governance, consent and audit:

- ab externo canaloplasty for primary open-angle glaucoma
- trabecular stent bypass microsurgery for open-angle glaucoma.
- trabeculotomy ab interno for open angle glaucoma.

Quality standards

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

10. Surgery

5 General principles of reassessment

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

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

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

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

When a visual field defect has previously been detected, use the same measurement strategy for each visual field assessment.

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

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

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

6 Ocular hypertension reassessments

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

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

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

- use clinical judgement to assess control of IOP and risk of conversion to COAG, and
- reassess according to the table below.

Time to next assessment for people with people being treated for ocular hypertension

Conversion from OHT to COAG	Control of IOP	Time to next assessment
Not detected or uncertain conversion	No	Review management plan and reassess between 1 and 4 months

Uncertain conversion	Yes	Reassess between 6 and 12 months
No conversion detected	Yes	Reassess between 18 and 24 months
Conversion	No or yes	See recommendations on the diagnosis and reassessment [See page 15] of COAG
Use clinical judgement to decide when the next appointment should take place within the recommended interval.		
Uncertain conversion includes having insufficient accurate information (perhaps because the person was unable to participate in the assessment).		

Quality standards

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

5. Monitoring

7. Stopping treatment

8. Service capacity

7 Suspected chronic open-angle glaucoma reassessments

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

When clinically indicated, repeat visual field testing using standard automated perimetry (central thresholding test) for people with COAG and those suspected of having visual field defects who are being investigated for possible COAG (see table below for recommended reassessment intervals).

When clinically indicated, repeat visual field testing using either a central thresholding test or a supra-threshold test for people with OHT and those suspected of having COAG whose visual

fields have previously been documented by standard threshold automated perimetry (central thresholding test) as being normal (see table below for recommended reassessment intervals).

For people with suspected COAG:

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

Time to next assessment for people with suspected chronic open-angle glaucoma

Conversion to COAG	Control of IOP	Time to next assessment
Not detected or uncertain conversion	No	Review management plan and reassess between 1 and 4 months
Uncertain conversion	Yes	Reassess between 6 and 12 months
No conversion detected	Yes	Reassess between 12 and 18 months
Conversion	No or yes	See recommendations on the diagnosis and reassessment [See page 15] of COAG
Use clinical judgement to decide when the next appointment should take place within the recommended interval.		
Uncertain conversion includes having insufficient accurate information (perhaps because the person was unable to participate in the assessment).		

Quality standards

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

5. Monitoring

7. Stopping treatment

8. Service capacity

8 Chronic open-angle glaucoma reassessments

When clinically indicated, repeat visual field testing using standard automated perimetry (central thresholding test) for people with COAG and those suspected of having visual field defects who are being investigated for possible COAG (see table below for recommended reassessment intervals).

For people with COAG:

- use clinical judgement to assess risk of COAG progression to sight loss, and
- reassess according to the table below.

Time to next assessment for people with chronic open-angle glaucoma

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

Use clinical judgement to decide when the next appointment should take place within the recommended interval.
Uncertain conversion includes having insufficient accurate information (perhaps because the person was unable to participate in the assessment).

Quality standards

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

5. Monitoring

7. Stopping treatment

8. Service capacity

Glossary

COAG and related conditions

(include COAG, OHT and suspected COAG)

5-FU

5-fluorouracil

ECLO

eye clinic liaison officer

CCT

central corneal thickness

COAG

chronic open-angle glaucoma

CVI

certificate of vision impairment

DVLA

Driver and Vehicle Licensing Agency

LVI

letter of vision impairment

IOP

intraocular pressure

MMC

mitomycin C

OCT

optical coherence tomography

OHT

ocular hypertension

PGA

prostaglandin analogue

Primary eye care professional

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

Repeat measures

(the repeated measurement of parameters related to the diagnosis of glaucoma: a simple repeat measures scheme may involve repeat measurement of IOP only; other repeat measures schemes may also include repeated measurement of visual fields and other relevant ocular parameters when clinically necessary)

RVI

referral of vision impairment

Sight loss

(sight loss in glaucoma is visual damage that manifests as blind spots in the field of vision: early on these are mostly asymptomatic with many people being unaware of a problem; sight loss may progress to visual impairment and eventually become symptomatic)

Sight tests

(a sight test determines whether or not a person has a sight defect, and if so what is needed to correct, remedy or relieve it: an optometrist performing a sight test has to conduct the examinations specified in the Sight Testing (Examination and Prescription) (No 2) Regulations

1989; these include an internal and external examination of the eyes and any other examinations needed to detect signs of injury, disease or abnormality in the eye or elsewhere)

Visual impairment

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

Sources

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

Your responsibility

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

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