

Open-angle Glaucoma (OAG)

[Disclaimer](#)

COVID-19 note

The Royal Australian and New Zealand College of Ophthalmologists (RANZCO) and The Royal Australian College of General Practitioners (RACGP) have made recommendations regarding eye examination during the COVID-19 pandemic. See RANZCO – [COVID-19: Practical Guidance for General Practitioners Performing Eye Examinations](#).

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Red Flags

- Acute angle-closure glaucoma (AACG)

Background – About Open-angle Glaucoma (OAG)

- Open-angle glaucoma is a form of glaucoma characterised by optic nerve damage resulting in progressive visual field loss, followed by central field loss.
- OAG can be classified as mild, moderate, and severe/advanced based on optic nerve parameters, field loss, and intraocular pressure (IOP).
- OAG is a leading cause of irreversible blindness and patients may have no symptoms until it is very advanced.
- Usually, but not always, OAG is accompanied by elevated IOP, so controlling IOP is part of the treatment.
- It is more accurately defined as an optic neuropathy, rather than a disease of high pressure.

Assessment

1. Check for any **risk factors**.

Risk factors

- *Increasing age – rare aged < 40 years, common aged > 65 years*
- *Family history – a first-degree relative with glaucoma*
- *Elevated intraocular pressure (IOP)*
- *Black African descent*
- *Previous eye trauma e.g., projectiles or punches*
- *Previous ocular surgery*
- *Myopia*
- *Retinal disease*
- *Migraine and peripheral vasospasm*
- *Diabetes*
- *Systemic hypertension*
- *Long-term use of steroids:*
 - *There is a risk of a rise in intraocular pressure (IOP), mostly seen with higher-dose systemic steroid or topical preparations, and very occasionally with long term inhaled and intranasal steroids.*
 - *Patients on intermittent low-dose steroids (i.e., inhaled, intranasal, or dermal), not used frequently or continuously, do not need routine testing.*

2. Check symptoms:
 - Most patients with OAG are asymptomatic and OAG tends to be an incidental finding.
 - Central visual field loss is a late manifestation and patients may not notice this until severe and irreversible damage has occurred.
3. Perform examination:
 - Measure **visual acuity**.

Visual acuity

1. Ask if the patient has distance glasses with them, and if either eye has had known poor vision i.e., a lazy eye.
 2. Test their distance vision in each eye, while wearing glasses, using a 3 or 4 m chart.
 3. Check each eye separately, with distance glasses if worn.
 4. If acuity is subnormal, check with a pinhole.
 5. If vision improves with a pinhole, and no cataract is present, then the patient requires a review of their glasses.
 6. If unable to read any letters on chart, assess the following in descending order:
 - Finger counting
 - Hand movements
 - Light perception
 7. Test near vision while patient is wearing reading glasses.
- If confident:
- perform **fundoscopy** to examine the optic disc.

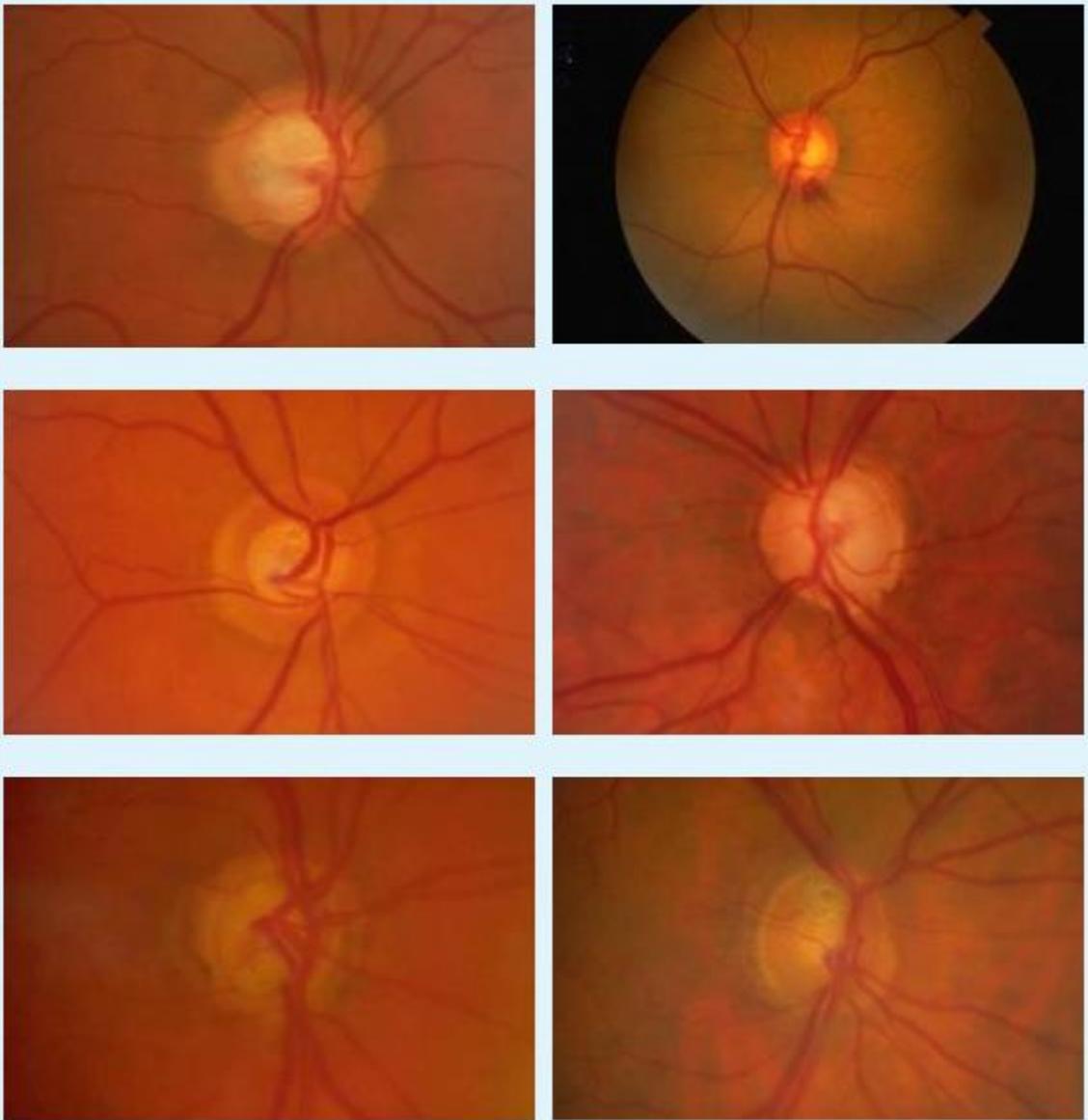
Fundus examination

- Dim lights.
 - Ask patient to look to a high point on the wall, a picture, door, or window frame.
 - Look through ophthalmoscope at arm's length to see red reflex, and follow this as you move towards the patient. When you are very close you'll see the disc and retina.
 - If abnormal red reflex, consider cataracts, corneal infection or scar, or vitreous haemorrhage.
 - Look for drusen (yellow deposits in retina), macular scars (late finding), red patches (subretinal haemorrhage), and retinal depigmentation.
- examine **physiologic cup**.

Physiologic cup

- This is the central depression within the optic disc.
 - Establish the margins of the cup and compare its size to that of the entire optic disc.
- Suspect glaucoma if any of:
- vertical cup to disc ratio (VCDR) > 0.6
 - significant **asymmetry in vertical cup disc ratio** between the eyes

Asymmetry in vertical cup disc ratio



- *disc margin haemorrhages*
- *presence of thinning of the optic nerve superiorly or inferiorly*

4. Consider **acute angle-closure glaucoma** as an alternative diagnosis.

Acute angle-closure glaucoma

- *This is not related to open-angle glaucoma, but rather it is a rare ophthalmic emergency.*
- *Symptoms include pain, red eye, nausea, and recent sudden loss of vision with raised intraocular pressure.*
- *See also [Acute Angle-Closure Glaucoma](#).*

5. If at-risk patient, advise about **glaucoma screening**.

Glaucoma screening

This is carried out by an [optometrist](#) or [private ophthalmologist](#).

- *If the patient has any risk factors other than age:*
 - *start screening at age 40 years*
 - *then every 2 years until age 50 years*
 - *then annually thereafter.*

- *If the patient has no risk factors, consider:*
 - *opportunistic screening (ideally every 2 years), for patients aged < 65 years.*
 - *annual optometry assessment for patients aged ≥ 65 years.*
 - *If the patient has a history of eye trauma, then screen every 5 years.*
6. If glaucoma suspected, arrange [optometry assessment](#) for a comprehensive eye and vision assessment to obtain **measurements** required for formal diagnosis of open-angle glaucoma.

Measurements

- *Tonometry for intraocular pressure (IOP) measurement*
- *Corneal thickness measurement*
- *Gonioscopy (anterior chamber configuration and depth)*
- *Perimetry (visual field measurements)*
- *Slit-lamp assessment of the optic nerve and fundus (pupil dilated)*

Management

1. If suspected AACG, manage according to the [Acute Angle-closure Glaucoma](#) pathway.
2. After seeing optometrist:
 - refer to the public system for [urgent or routine ophthalmology referral](#) (see Statewide referral criteria) if:
 - advanced glaucoma.
 - unstable, progressive glaucoma.
 - refer for private [immediate ophthalmology referral or admission](#) if intraocular pressure (IOP) > 35 mmHg.
 - refer for prompt private [urgent or routine ophthalmology referral](#) if:
 - IOP 28 to 35 mmHg.
 - moderate OAG.
 - refer for private [urgent or routine ophthalmology referral](#) if:
 - newly diagnosed OAG.
 - early or mild OAG.
 - stable OAG.
 - IOP < 28 mmHg and progressive visual field or optical coherence tomography (OCT) changes.
3. Monitor and continue to prescribe any [Glaucoma medications](#) initiated by the ophthalmologist:

Glaucoma medications

Class	Generic and brand name	Adverse effects
Prostaglandin analogues	<ul style="list-style-type: none"> Latanoprost (Xalatan) Bimatoprost (Lumigan) Travoprost (Travatan) 	<ul style="list-style-type: none"> Lash growth, iris pigmentation, red eye Minimal systemic effects
Beta blockers	<ul style="list-style-type: none"> Timolol (Tenopt) Betaxolol (Betoptic) 	Wheeze, dyspnoea, falls, hypotension, bradycardia, heart block, depression
Carbonic anhydrase inhibitors	<ul style="list-style-type: none"> Dorzolamide (Trusopt) Brinzolamide (Azopt) Acetazolamide (Diamox) 	Allergy, lethargy, electrolyte disturbance (acetazolamide)
Alpha agonists	<ul style="list-style-type: none"> Brimonidine (Alphagan) Apraclonidine (Iopidine) 	<ul style="list-style-type: none"> Allergy, red eye, fatigue, hypotension Interaction with MAOI
Miotics	<ul style="list-style-type: none"> Pilocarpine 	Brow ache, myopia, possible systemic cholinergic effects
Combination preparations	<ul style="list-style-type: none"> Travoprost + timolol (Duotrav) Bimatoprost + timolol (Ganfort) Latanoprost + timolol (Xalacom) Dorzolamide + timolol (Cosopt) Brinzolamide + timolol (Azarga) Brimonidine + timolol (Combigan) 	<ul style="list-style-type: none"> As individual components Timolol does have the greatest potential for systemic side-effects

- Avoid medications known to raise intraocular pressure (IOP) whenever possible e.g., steroids.
- Advise the patient that irritation and mild pain may be a side-effect of some topical glaucoma eye-drops – these drops should not be stopped unless **significant toxicity** is suspected.

Significant toxicity

Patients should seek ophthalmology advice within 2 to 3 weeks if:

- *eyes constantly painful*
- *vision blurred*
- *periocular dermatitis-like reaction around the eyes*

- Ensure that there is an appropriate follow-up plan initiated by the treating ophthalmologist.
2. Provide patient information (see below) including possible restrictions on driving for patients with glaucoma.
 3. For untreatable low vision (BCVA 6/18 or worse) and legal blindness (BCVA 6/60 or worse), consider [Vision Australia assessment](#).
 4. Advise any patient taking long-term steroids to have an annual IOP check at an optometrist.

Referral

After seeing optometrist:

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Information

For health professionals

Further information

- National Prescribing Service – [The Medical Treatment of Glaucoma](#)
- National Health and Medical Research Council – [A Guide to Glaucoma for Primary Health Care Providers](#)
- NSW Agency for Clinical Innovation – [Eye Emergency Manual: Red Eye](#)
- RACGP – [Guidelines for Preventive Activities in General Practice: Glaucoma](#)

For patients

- Better Health Channel – [Eyes: Glaucoma](#)
- Glaucoma Australia – [Brochures and Fact Sheets](#)

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