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:
  o opportunistic screening (ideally every 2 years), for patients aged < 65 years.
  o 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:
     o advanced glaucoma.
     o 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:
     o IOP 28 to 35 mmHg.
     o moderate OAG.
   • refer for private urgent or routine ophthalmology referral if:
     o newly diagnosed OAG.
     o early or mild OAG.
     o stable OAG.
     o 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:
**Glaucome medications**

<table>
<thead>
<tr>
<th>Class</th>
<th>Generic and brand name</th>
<th>Adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostaglandin analogues</td>
<td>• Latanoprost (Xalatan)</td>
<td>• Lash growth, iris pigmentation, red eye</td>
</tr>
<tr>
<td></td>
<td>• Bimatoprost (Lumigan)</td>
<td>• Minimal systemic effects</td>
</tr>
<tr>
<td></td>
<td>• Travoprost (Travatan)</td>
<td></td>
</tr>
<tr>
<td>Beta blockers</td>
<td>• Timolol (Tenopt)</td>
<td>Wheeze, dyspnoea, falls, hypotension, bradycardia, heart block, depression</td>
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<tr>
<td></td>
<td>• Betaxolol (Betoptic)</td>
<td></td>
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<tr>
<td>Carbonic anhydrase inhibitors</td>
<td>• Dorzolamide (Trusopt)</td>
<td>Allergy, lethargy, electrolyte disturbance (acetazolamide)</td>
</tr>
<tr>
<td></td>
<td>• Brinzolamide (Azopt)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Acetazolamide (Diamox)</td>
<td></td>
</tr>
<tr>
<td>Alpha agonists</td>
<td>• Brimonidine (Alphagan)</td>
<td>Allergy, red eye, fatigue, hypotension</td>
</tr>
<tr>
<td></td>
<td>• Apraclonidine (Iopidine)</td>
<td>• Interaction with MAOI</td>
</tr>
<tr>
<td>Miotics</td>
<td>• Pilocarpine</td>
<td>Brow ache, myopia, possible systemic cholinergic effects</td>
</tr>
<tr>
<td>Combination preparations</td>
<td>• Travoprost + timolol (Duotrav)</td>
<td>• As individual components</td>
</tr>
<tr>
<td></td>
<td>• Bimatoprost + timolol (Ganfort)</td>
<td>• Timolol does have the greatest potential for systemic side-effects</td>
</tr>
<tr>
<td></td>
<td>• Latanoprost + timolol (Xalacom)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dorzolamide + timolol (Cosopt)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Brinzolamide + timolol (Azarga)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Brimonidine + timolol (Combigan)</td>
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</tbody>
</table>

- 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:

- refer to the public system for urgent or routine ophthalmology referral (see Statewide referral criteria) if:
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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
- RACGP – Guidelines for Preventive Activities in General Practice: Glaucoma

For patients

- Better Health Channel – Eyes: Glaucoma
- Glaucoma Australia – Brochures and Fact Sheets

Disclaimer

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