Centre for Eye Health

# Chair-side Reference: Glaucoma Medications for Optometrists

Optometry NEW SOUTH WALES AUSTRALIAN CAPITAL TERRITORY

Therapeutically-endorsed optometrists are able to prescribe anti-glaucoma medications for patients in accordance with management and co-management guidelines set by the Optometry Board of Australia.
All optometrists, irrespective of whether or not they intend on prescribing these medications, need to be aware of the common adverse events, contraindications and precautions associated with these medications. The following reference presents, in brief, some of more common or serious adverse events, contraindications and precautions for topical medications currently available for Australian optometrists to prescribe. A more exhaustive list may be found in other sources (i.e. MIMS).

## CLASS: PROSTAGLANDIN ANALOGUES (PGAs)



| Formulation | Dose | IOP reduction | Adverse reactions | | Contraindications & precautions | |
|---|---|---|---|---|---|---|
| Latanoprost 0.005% (Xalatan, Xalaprost)<br><br>Travoprost 0.004% (Travatan)<br><br>Bimatoprost 0.03% (Lumigan, Lumigan PF)<br><br>Tafluprost* 0.0015% (Saflutan - minims) | nocte (at night) | 25-35%<br>Starts 2-4 hrs<br>Max at 8-12 hrs | *Ocular:*<br>• Common effects typically cosmetic: increased iris pigmentation; eye irritation; eyelash and vellus hair changes (darkening, thickening, lengthening, increased number); periorbitopathy and periorbital pigmentation; conjunctival hyperaemia<br>• More severe (but rare): Iritis/uveitis, reactivation of herpes simplex keratitis, macular oedema | *Systemic:*<br>• Typically uncommon in occurrence<br>• In some susceptible individuals, may cause asthma aggravation (or similar respiratory symptoms) | *Contraindications:*<br>• Known hypersensitivity to the drug or any known excipients | *Precautions:*<br>• Warn patients of cosmetic effects<br>• Aphakia or pseudophakia (potential for macular oedema), recent ocular surgery, ocular inflammatory or infective (e.g. herpetic) conditions<br>• Contact lens wear (in preserved eye drops)<br>• Severe or brittle asthma<br>*Special populations:*<br>• Pregnancy B3; lactation: *no data available*<br>• Paediatric: *not recommended in children*<br>*Pertinent drug interactions:*<br>• Paradoxical elevation in IOP reported with concomitant dosing of two PGAs |

## CLASS: BETA BLOCKERS (BBs)

| Formulation | Dose | IOP reduction | Adverse reactions | | Contraindications & precautions | |
|---|---|---|---|---|---|---|
| Timolol 0.25%, 0.5% (Timoptol, Timoptol-XE, Tenopt)<br>Also: Nyogel 0.1%<br><br>Betaxolol 0.25%, 0.5% (Betoptic, Betoptic S, BetoQuin ) | mane (in the morning)<br><br>or<br><br>nocte<br><br>or<br><br>bid/bds *(twice daily)*** | 20-30%<br>Starts 20 mins<br>Max at 1-2 hrs | *Ocular:*<br>• Uncommon; generally well-tolerated<br>• May include: mild stinging, burning, blurred vision or dry eyes | *Systemic:*<br>• Cardiovascular: bradycardia, arrhythmia, hypotension, syncope, heart block, cerebrovascular accident, palpitations, cardiac arrest, Raynaud's phenomenon, AV block, sinoatrial block<br>• Respiratory: pulmonary oedema, bronchospasm, exacerbation of asthma<br>• Decreased libido<br>• GI upset<br>• CNS effects: dizziness, depression, insomnia, memory loss | *Contraindications:*<br>• Known hypersensitivity to the drug or any known excipients<br>• Reactive airway disease, bronchospasm, bronchial asthma, history of bronchial asthma, or severe COPD<br>• Sinus bradycardia;,sinoatrial block, second and third degree AV block, overt cardiac failure, cardiogenic shock | *Precautions:*<br>• Cardiorespiratory: cardiac failure, first degree heart block, respiratory complications, mild/moderate COPD<br>• Vascular: severe peripheral circulatory disorders or disturbances (Raynaud's)<br>• Diabetes: may mask hypoglycaemic symptoms in diabetes; may mask thyrotoxicosis<br>• Contact lens wear (in preserved eye drops)<br>*Special populations:*<br>• Pregnancy C (bradycardia possible); lactation: *not advised*<br>• Paediatric: *not established in children*<br>*Pertinent drug interactions*<br>• Concurrent CYP2D6 inhibitors, catecholamine depleting drugs, BBs<br>• Oral calcium antagonists; antiarrhythmics, parasympathomimetics, dilitiazem, verapamil |

## CLASS: ALPHA-AGONIST (AA)

| Formulation | Dose | IOP reduction | Adverse reactions | | Contraindications & precautions | |
|---|---|---|---|---|---|---|
| Brimonidine 0.2% (Alphagan, Enidin), 0.15% (Alphagan-P)<br><br>Apraclonidine*** 0.5% (Iopidine) | bid or tid *(3x a day)* | 20-25%<br>Max at 2 hours | *Ocular:*<br>• Common: follicular conjunctivitis, hyperaemia, overall stinging<br>• Overall, poorly tolerated by the ocular surface (approximately one-third discontinue on the basis of anterior eye symptoms), i.e. delayed hypersensitivity reaction | *Systemic:*<br>• Uncommon, but potentially: oral dryness, headache and fatigue/drowsiness; sometimes effects on cardiovascular system | *Contraindications:*<br>• Known hypersensitivity to the drug or any known excipients<br>• Patients receiving monoamine oxidase inhibitors (MAOIs) | *Precautions:*<br>• Patients with cardiac disease, depression or CNS disease<br>• May have loss of effect over time<br>• Contact lens wear (in preserved eye drops)<br>*Special populations:*<br>• Pregnancy: *avoid apraclonidine; brimonidine maybe suitable if necessary (but generally avoid)*<br>• Paediatric: *not recommended in children*<br>*Pertinent drug interactions:*<br>• Potentiating effect with CNS depressants; caution with concomitant BBs, antihypertensives and cardiac glycosides<br>• Tricyclic antidepressants may interfere with IOP lowering effect |

* At the time of publication, tafluprost was on the optometry PBS list, but NOT a board approved medication for optometry
** The dosing regimen of timolol may differ depending on the stage of glaucoma, whether it is used as monotherapy or adjunctive therapy
*** At the time of publication, Apraclonidine is on the board approved list of medications for optometry but is an not optometric Item on the PBS. It is not typically used for long term glaucoma management due to tachyphylaxis

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## CLASS: CARBONIC ANHYDRASE INHIBITORS

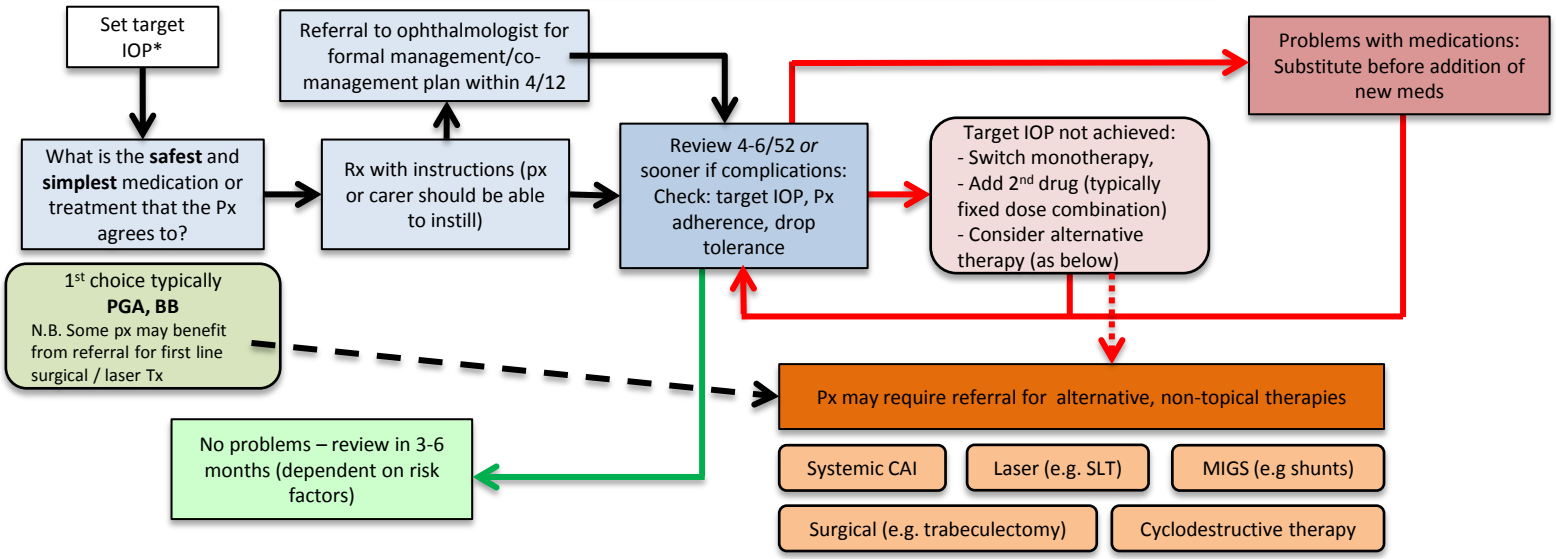


| Formulation | Dose | IOP reduction | Adverse reactions | | Contraindications & precautions | |
|---|---|---|---|---|---|---|
| Brinzolamide 1.0% (Azopt, BrinzoQuin)<br><br>Dorzolamide 2.0% (Trusopt, Trusamide) | bid | 15-20%<br>Max at 2 hrs | *Ocular:*<br>• Generally well-tolerated<br>• Rare, but severe: endothelial decompensation, Stevens-Johnson syndrome | *Systemic:*<br>• Commonly: bitter taste, dry mouth<br>• May also have headache, nausea, dizziness, fatigue<br>• Potential for anaphylaxis | *Contraindications:*<br>• Known hypersensitivity to the drug or any known excipients<br>• Corneal grafts, endothelial dystrophy<br>• **Allergy to sulphonamides** | *Precautions:*<br>• Severe renal/hepatic impairment<br>• Contact lens wear (in preserved eye drops)<br>*Special populations:*<br>• Pregnancy B3; lactation: *no data available*<br>• Paediatric: *not recommended in children*<br>*Pertinent drug interactions:*<br>• (Similar to systemic CAI): aspirin (high-dose), lithium, cyclosporine, diuretics, digoxin |

## CLASS: MIOTIC

| Formulation | Dose | IOP reduction | Adverse reactions | | Contraindications & precautions | |
|---|---|---|---|---|---|---|
| Pilocarpine 1%, 2% or 4% (Isopto Carpine) | bid to qid *(2-4x a day)* | 15-20%<br>Max at 3-4 hrs | *Ocular:*<br>• Commonly: blurry vision (especially at distance), ciliary spasm, reduced night vision, myopic shift<br>• Paradoxical rise in IOP may be observed in patients with severely compromised trabecular meshwork<br>• Aggravation of pupillary block<br>• Rare, but severe: retinal detachment | *Systemic:*<br>• Exacerbation of pre-existing systemic disease (gastrointestinal irritation, bronchospasm, hypotension, bradycardia)<br>• CNS symptoms: nausea, headache | *Contraindications:*<br>• Known hypersensitivity to the drug or any known excipients<br>• When pupillary constriction undesirable; acute uveitis/iritis | *Precautions:*<br>• Patients susceptible to retinal detachment (e.g. high myopes, recent cataract surgery, pseudophakia)<br>• Patients with severe cardiac, respiratory, gastrointestinal, thyroid or Parkinson's disease<br>• May affect ability to drive<br>• Contact lens wear (in preserved eye drops)<br>*Special populations:*<br>• Pregnancy B3<br>• Paediatric: *not established in children*<br>*Pertinent drug interactions*<br>• Concurrent CYP2D6 inhibitors, catecholamine depleting drugs, BBs<br>• Oral calcium antagonists, antiarrhythmics, parasympathomimetics, dilitiazem, verapami |

*An example medication decision making tree, adapted from the NHMRC glaucoma guidelines (2010). The needs of individual patients may vary considerably.*




**Important notes:**

*1) During this process, the primary care physician and other co-managing clinicians should be kept updated.*

2) **All glaucoma management** should be carried out in accordance with the Optometry Board of Australia guidelines (available at: http://www.optometryboard.gov.au/Policies-Codes-Guidelines.aspx) and consider existing published best practice guidelines relevant to each individual case and situation.

3) It is the responsibility of the managing clinicians to keep up-to-date regarding the latest in legislation, guidelines and evidence-based practice protocols.

4) * Target IOP should be set as per the recommendations of the NHMRC glaucoma guidelines (available at: https://www.nhmrc.gov.au/guidelines-publications/cp113-cp113b)