Drugs for Open Angle Glaucoma

full update February 2025

The following chart has info on available glaucoma meds, including cost, select side effects, mechanism of action, and dosing frequency. For general information on glaucoma pharmacotherapy, see **footnote c.**

Drug	Approximate Cost[a]	Select Side Effects[1,3,7,10]	Comments
Prostaglandin analogs			
Bimatoprost 0.01% Lumigan (US), Lumigan RC (Canada)	US: $260/2.5 mL, $530/5 mL, $790/7.5 mL Canada: $70/5 mL, $100/7.5 mL	• Allergic Reactions • Anterior uveitis • Cystoid macular edema • Darkening of eyelid, eyelashes, and iris • Eye redness (lowest risk with latanoprost[2]), stinging, and itching • Foreign body sensation • Herpes virus activation • Increased and/or misdirected eyelash growth • Keratitis • Orbital soft tissue changes • Ptosis	• **Role:** first-line due to efficacy, tolerability, and once-daily dosing.[1] • **Most effective** drugs for IOP reduction (25% to 33%).[1,2] All prostaglandin analogs are similarly effective.[2] • **MOA**: increased aqueous humor outflow[1] • **Usual dosing frequency**: once daily in the evening[3] • **Avoid in**: macular edema, history of herpetic keratitis, active uveitis[1] • Latanoprostene bunod is metabolized to the active moieties latanoprost acid and nitric oxide. They increase aqueous humor outflow via different mechanisms. Latanoprostene bunod does not reduce IOP much more than latanoprost alone.[4]
Bimatoprost 0.03% (Canada) Vistitan, Zimed PF	Vistitan: $50/5 mL Zimed PF: $60.5 mL		
Latanoprost 0.005% Xalatan, generics	US: $10/2.5 mL Canada: $10/2.5 mL		
Latanoprost 0.005% preservative-free Iyuzeh (US), Monoprost (Canada)	US: $320/30 doses Canada: $20/30 doses		
Latanoprost/Netarsudil (US) Rocklatan 0.005%/0.02%	US: $350/2.5 mL		
Latanoprost/Timolol (Canada) Xalacom 0.005%/0.5%, generics	Canada: $10/2.5 mL		
Latanoprostene bunod 0.024% Vyzulta	US: $260/2.5 mL, $520/5 mL Canada: $30/5 mL		
Tafluprost 0.0015%. (US) Zioptan, generics	US: $160/30 doses		
Travoprost 0.003% (Canada) Izba	Canada: $20/5 mL		
Travoprost 0.004%, Travatan Z, generics	US: $80/2.5 mL, $160/5 mL Canada: $45/5 mL		
Travoprost/Timolol (Canada) DuoTrav PQ 0.004%/0.5%, generics	Canada: $50/5 mL		

Drug	Approximate Cost[a]	Select Side Effects[1,3,7,10]	Comments
Beta-Blockers			
Betaxolol 0.5% solution (US)	US: $50/5 mL; $90/10 mL, $140/15mL	• Allergic reactions • Bradycardia • Bronchospasm • Blurred vision • Corneal anesthesia • Exercise intolerance • Eye irritation (highest risk with betaxolol), dryness, redness • Depression • Hypotension • Impotence • Keratitis • Ptosis	• **Role**: second-line or adjunct.[7,8] • **Efficacy**: 20% to 25% IOP reduction.[1] • **MOA**: decreased aqueous humor production[1] • **Usual dosing frequency**: once daily in the **morning**, to BID.[1] • **Avoid in**: severe COPD (nonselective agents), asthma (nonselective agents), acute heart failure, bradycardia, second- or third-degree heart block[1,3] • Could in theory mask hypoglycemia symptoms.[5] • **Betaxolol** is beta-1 selective, but not as effective as nonselective agents.[1,2] • **Betaxolol** 0.25% suspension is as effective as the 0.5% solution and is better tolerated.[8] • Ophthalmic administration of beta-blockers can result in significant blood levels. For example, one drop of timolol 0.5% in each eye can equal as much as 10 mg of oral timolol.[6] See **footnote c** for information on administration techniques to limit systemic absorption.
Betaxolol 0.25% suspension Betoptic *S*	US: $610/15 mL, $410/10 mL Canada: $15/5 mL		
Carteolol 1% (US)	US: $15/5 mL, $25/10 mL, $35/15 mL		
Levobunolol (US) Betagan 0.25%, 0.5% (generic only)	US: $20/5 mL (either strength)		
Timolol hemihydrate (US) Betimol 0.25%, 0.5% (generic available)	US: $150/5 mL (Betimol 0.25%); 0.5% (generic): $110/5 mL, $210/10 ml, $290/15 mL		
Timolol maleate See **Prostaglandins**, above, for combo products Xalacom and DuoTrav PQ.			
Istalol (US) 0.5%, generics	US: $130/2.5 mL, $240/5 mL		
Timoptic 0.25%, 0.5%, generics	US: <$5/5 mL[b] (0.25%), <$10/5 mL[b] (0.5%); Canada: $25/10 mL (0.25%), <$10/5 mL (0.5%), $15/10 mL (0.5%)		
Timoptic in Ocudose (US) 0.25%. 0.5%, generics	US: $400/60 doses (0.25%), $210/60 doses (0.5%)		
Timoptic XE gel forming solution 0.25%, 0.5%, generics	US: $180/5 mL (0.25%), $190/5 mL (0.5%); Canada: $20/5 mL (0.25%, 0.5%)		
Timolol/Brimonidine Combigan 0.5%/0.2%, generics	US: $100/5 mL, $200/10 mL, $330/15 mL Canada: $25/10 mL		
Timolol/Brinzolamide (Canada) Azarga 0.5%/1%	Canada: $20/5 mL		
Timolol/Dorzolamide 0.5%/2%, Cosopt, Cosopt PF (US), generics; Cosopt Preservative-Free (Canada)	US: $30/10 mL; $120/60 doses (preservative-free) Canada: $20/10 mL; $50/60 doses (preservative-free)		

Drug	Approximate Cost[a]	Select Side Effects[1,3,7,10]	Comments
Carbonic Anhydrase Inhibitors			
Acetazolamide (oral) 125 mg tablet (US), 250 mg tablet; 500 mg extended-release capsule (US)	**500 mg ER BID dose or 250 mg IR QID dose:** US: $80/30 days Canada: $20/30 days (IR)	**Topical**: • Allergic dermatitis/ conjunctivitis • Corneal edema • Irritation of eye • Keratitis • Bad taste **Oral**: • Anorexia • Blood dyscrasias • Depression • Diarrhea • Diuresis • GI side effects • Hypokalemia • Hyponatremia • Kidney stones • Malaise • Metabolic acidosis • Metallic taste • Paresthesia • Stevens-Johnson syndrome • Weakness	• **Role**: second or third-line, usually as part of combination therapy (topicals).[1,7] Oral agents are usually reserved for short-term use (e.g., prior to surgery or for acute increases in IOP).[7] • **Efficacy**: 20% to 30% IOP reduction (oral); 15% to 20% IOP reduction (topical)[1] • Do not combine orals and topicals; toxicity may be increased without additive efficacy.[8] • **MOA**: decreased aqueous humor production[1] • **Usual dosing frequency**: BID to TID (topical);[8] once daily to QID (oral)[3] • **Avoid orals in**: hypokalemia, hyponatremia, severe liver or kidney impairment, sulfonamide allergy, kidney stones[1,3] • **Avoid topicals in**: severe kidney impairment, sulfonamide allergy[1,3]
Brinzolamide 1% Azopt 1%, generics (US) (See **Beta-Blockers** section for combo product Azarga [Canada])	US: $300/10 mL, $450/15 mL Canada: $20/5 mL		
Brinzolamide/Brimonidine Simbrinza 1%/0.2%	US: $210/8 mL Canada: $50/10 mL		
Dorzolamide 2% Trusopt, generics Trusopt Preservative-Free (Canada) (See **Beta-Blockers** section for combo products Cosopt, Cosopt PF [US], Cosopt Preservative-Free [Canada])	US: $20/10 mL Canada: <$10/5 mL; $80/60 doses (preservative-free)		
Methazolamide (oral)	**50 mg BID dose:** US: $260/30 days Canada: $40/30 days		
Alpha-2 Agonists			
Apraclonidine 0.5% Iopidine (generics [US])	US: $60/5 mL; $130/10 mL Canada: $30/5 mL	• Allergic dermatitis/ conjunctivitis • Anterior uveitis • Topical allergic reactions (more common with apraclonidine[8])	• **Role**: second-line (brimonidine);[8] **short-term** adjunctive therapy (apraclonidine).[1,3] Note that apraclonidine **1%** is not indicated for glaucoma.[3] ○ Apraclonidine use is limited by tachyphylaxis.[8]
Brimonidine Alphagan 0.2% (Canada), generics Alphagan P 0.1% (US only),0.15%, generics	Alphagan 0.2% generic US ~$10 (5, 10, 15 mL) Canada: $<10/5 mL, $10/10 mL		

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Drug	Approximate Cost[a]	Select Side Effects[1,3,7,10]	Comments
Brimonidine, continued (See **Carbonic Anhydrase Inhibitors** section for combo product Simbrinza. See **Beta-Blockers** section for combo product Combigan)	Alphagan P 0.1% generic US: $160/5 mL, $320/10 mL, $470/15 mL Alphagan P 0.15% generic US: $140/5 mL, $280/10 mL, $430/15 mL Canada: $10/5 mL, $20/10 mL	• Dizziness • Dry mouth and nose • Fatigue • Headache • Hypotension • Lid retraction • Somnolence	• **Efficacy**: 20% to 25% IOP reduction (brimonidine > apraclonidine).[1,2] • *Alphagan P* and *Alphagan* have different preservatives (Purite and BAK, respectively).[8] Purite enhances brimonidine eye penetration and is less irritating than BAK.[8] • **MOA**: initial reduction in aqueous humor production, then increased aqueous humor outflow[3] • **Usual dosing frequency**: TID[3] • **Avoid**: use in children, use with a monoamine oxidase inhibitor[10]
Parasympathomimetics			
Echothiophate Phospholine Iodide (US)	US: $2,861.18/5 mL	• Brow ache • Conjunctivitis • Increased lacrimation • Myopia with blurred vision • Retinal tears or detachment	• **Role**: last-line.[8] • **Efficacy**: 20% to 25% IOP reduction[1] • **MOA**: increased aqueous humor outflow[1] • **Usual dosing frequency**: once every-other-day to BID (echothiophate); QID (pilocarpine)[8] • **Avoid in**: irits, uveitis[3]
Pilocarpine generics 1%, 2%, 4% (US); Isopto-Carpine 2% (Canada)	US: $60/15 mL (1%, 2%), $110/15 mL (4%) Canada: <$10/15 mL		
Rho Kinase (ROCK) Inhibitors			
Netarsudil 0.02% (US) Rhopressa (See **Prostaglandin analogs** section for combo product Rocklatan.)	US: $130/2.5 mL	• Blurred vision • Conjunctival hemorrhage and redness • Corneal haze and verticillata • Keratitis • Pain with instillation • Tearing	• **Role**: adjunct.[10] • **Efficacy**: 25% to 30% IOP reduction[10] Most effective in patients with lower pre-treatment IOP (<25 mmHg).[9] • **MOA**: increased aqueous humor outflow[3] • **Usual dosing frequency**: once daily in the evening[3] • Discontinuation due to adverse effects greater than with timolol or latanoprost.[10]

Abbreviations: BAK = benzalkonium chloride; IOP = intraocular pressure

a. Wholesale acquisition cost (WAC) of generic, if available. US medication pricing by Elsevier, accessed February 2025.
b. Other sizes may be available.
c. Considerations for choosing an agent include cost, efficacy, side effects, comorbidities, patient preference, and dosing schedule.[1,10] If a single medication does not produce an adequate response, switch medication classes, or add another agent.[1,10] Additional efficacy is seen when agents with different mechanisms of action are used in combination.[8,10] Switching within a class can be tried to address adverse effects.[10] Two or three medications may be required to achieve the desired IOP reduction.[10] Counsel patients to wait three to five minutes between administration of different medications.[10] Combination products may improve adherence and reduce eye exposure to preservatives.[1] To decrease systemic absorption, patients should be counseled to press on the bridge of the nose in the corner of the eye (i.e., nasolacrimal occlusion) during and for three to five minutes after administration, or close their eyes after administration.[1,8]

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References

1. Gedde SJ, Vinod K, Wright MM, et al. Primary Open-Angle Glaucoma Preferred Practice Pattern®. Ophthalmology. 2021 Jan;128(1):P71-P150.
2. Li T, Lindsley K, Rouse B, et al. Comparative Effectiveness of First-Line Medications for Primary Open-Angle Glaucoma: A Systematic Review and Network Meta-analysis. Ophthalmology. 2016 Jan;123(1):129-40.
3. Clinical Pharmacology powered by ClinicalKey. Tampa (FL): Elsevier. 2025. http://www.clinicalkey.com. (Accessed February 13, 2025).
4. Soltani G, Shalaby WS, Razeghinejad R. Latanoprostene bunod: the first nitric oxide-donating antiglaucoma medication. Med Gas Res. 2025 Jun 1;15(2):220-227.
5. Vaajanen A, Vapaatalo H. A Single Drop in the Eye - Effects on the Whole Body? Open Ophthalmol J. 2017 Oct 31;11:305-314.
6. Pratt NL, Ramsay EN, Kalisch Ellett LM, et al. Association between Ophthalmic Timolol and Hospitalisation for Bradycardia. J Ophthalmol. 2015;2015:567387.
7. Stoner A, Harris A, Oddone F, et al. Topical carbonic anhydrase inhibitors and glaucoma in 2021: where do we stand? Br J Ophthalmol. 2022 Oct;106(10):1332-1337.
8. Carey K, Hendricks BC. Eye disorders. In: Zeind CS, Carvalho MG, Cheng JWM, et al., editors. Applied Therapeutics: the Clinical Use of Drugs. 12th ed. Philadelphia, PA: Wolters Kluwer Health, 2024:1183-1206.
9. Product information for Rhopressa. Alcon Laboratories. Fort Worth, TX 76134. September 2024.
10. American Optometric Association. Evidence-based clinical practice guideline. Care of the patient with primary open-angle glaucoma. First edition. Approved October 5, 2024. https://www.aoa.org/a/19461. (Accessed February 20, 2025).

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