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**Drug Use Research & Management Program**  
Oregon State University, 500 Summer Street NE, E35  
Salem, Oregon 97301-1079  
Phone 503-947-5220 | Fax 503-947-2596



## Drug Class Literature Scan: Glaucoma Drugs

**Date of Review:** August 2026

**Literature Search:** 01/01/2023-05/01/2026

**Date of Last Review:** April 2023

### Current Status of PDL Class:

See **Appendix 1**.

### Plain Language Summary:

- Glaucoma is an eye disease that damages the optic nerve, often due to high eye pressure, and can lead to permanent vision loss or blindness.
- Glaucoma treatment lowers eye pressure most commonly with eye drops to prevent further damage.
- The Oregon Health Plan (OHP) has numerous treatments for glaucoma available on the Preferred Drug List (PDL). No meaningful differences in effectiveness have been identified with the eye drops used to treat glaucoma.

### Conclusions:

- No new high-quality systematic reviews have been published since the last review of this drug class. Two high-quality guidelines have been published. Both guidelines support current OHP fee-for-service (FFS) policies for preferred ophthalmic medications.
- The FDA has issued safety warnings for several ophthalmic medications. These warnings are summarized in **Table 1**.

### Recommendations:

- No changes to the PDL are recommended based on review of recent evidence.
- After reviewing drugs costs in executive session, the following recommendations were accepted:
  - Make dorzolamide drops and brimonidine drops preferred. Make the beta blockers levobunolol and timolol maleate-PF preferred.

### Summary of Prior Reviews and Current Policy

- The glaucoma drug class was last reviewed by the Pharmacy and Therapeutics Committee at the April 2023 meeting. After reviewing evidence for a new prostaglandin analog, omidenepag, the Committee agreed to maintain the medication product as non-preferred on the PDL. No additional PDL changes were recommended based on a review of the evidence.
- No evidence of meaningful differences in efficacy or effectiveness was identified with the ophthalmic products used to treat glaucoma. Fixed-combination products have not shown to provide substantial clinical benefit over the individual drug products.
- The OHP provides broad coverage for glaucoma treatments for each class of therapies: miotics, alpha- adrenergic agonists, beta-blockers, carbonic anhydrase inhibitors, and prostaglandin analogs (**Appendix 1**). No clinical prior authorization criteria are implemented for these drugs.
- About 1,700 OHP members have a glaucoma diagnosis, and these products are commonly utilized in OHP FFS program.

Author: Deanna Moretz, PharmD, BCPS

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**Methods:**

A Medline literature search for new systematic reviews and randomized controlled trials (RCTs) assessing clinically relevant outcomes to active controls, or placebo if needed, was conducted. The Medline search strategy used for this literature scan is available in **Appendix 3**, which includes dates, search terms and limits used. The OHSU Drug Effectiveness Review Project, Agency for Healthcare Research and Quality (AHRQ), National Institute for Health and Clinical Excellence (NICE), Department of Veterans Affairs, the Scottish Intercollegiate Guidelines Network (SIGN), and the Canada's Drug Agency (CDA-AMA) resources were manually searched for high quality and relevant systematic reviews. When necessary, systematic reviews are critically appraised for quality using the AMSTAR tool and clinical practice guidelines using the AGREE tool. The FDA website was searched for new drug approvals, indications, and pertinent safety alerts.

The primary focus of the evidence is on high quality systematic reviews and evidence-based guidelines. Randomized, comparative, controlled trials will be emphasized if evidence is lacking or insufficient from those preferred sources.

**New Systematic Reviews:**

After review, 4 systematic reviews were excluded due to poor quality, wrong study design of included studies (e.g., observational), comparator (e.g., no control or placebo-controlled), or outcomes studied (e.g., non-clinical).<sup>1-4</sup>

No high-quality systematic reviews were identified.

**New Guidelines:****European Glaucoma Society**

Guidelines from the European Glaucoma Society (EGS) were updated in 2025. Two updated guidelines reinforce the current OHP PDL status for glaucoma medications. The EGS recommend:

- Initiate monotherapy to treat high intraocular pressure (IOP). Laser trabeculoplasty is also a recommended option as first-line treatment. Patients with high IOPs (e.g., high 20 mms Hg or above) or severe disease may need a combination of drugs, laser trabeculoplasty or surgery (trabeculectomy). (Strength of Recommendation: Strong; Level of Evidence: High).<sup>5</sup>
- Prostaglandin analogs are the most effective medications and are usually recommended as a first-line treatment option for open-angle glaucoma. (Strength of Recommendation: Strong; Level of Evidence: High).<sup>5</sup>

**National Institute for Health and Care Excellence**

NICE published guidance for latanoprost-netarsudil for previously treated primary open angle glaucoma or ocular hypertension in 2024. NICE recommends:

- Latanoprost–netarsudil is an option for reducing IOP in adults with primary open-angle glaucoma or ocular hypertension when a prostaglandin analogue alone did not sufficiently reduced IOP, and if:
  - A fixed-dose combination treatment has not sufficiently reduced IOP; OR
  - A fixed-dose combination treatment containing a beta-blocker is clinically inappropriate.<sup>6</sup>

## New FDA Safety Alerts:

**Table 1. Description of New FDA Safety Alerts.<sup>7</sup>**

| Generic Name           | Brand Name                         | Month / Year of Change | Location of Change (Boxed Warning, Warnings, CI) | Addition or Change and Mitigation Principles (if applicable)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------|------------------------------------|------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tafluprost             | ZIOPTAN                            | 2/2026                 | Warnings and Precautions                         | <b>Contact Lens Use</b><br><br>Contact lenses should be removed prior to the administration of ZIOPTAN and may be reinserted 15 minutes after administration.                                                                                                                                                                                                                                                                                                                                                                  |
| Brimonidine            | ALPHAGAN<br>ALPHAGAN P<br>COMBIGAN | 9/2025                 | Warnings and Precautions                         | <b>Contamination of Topical Ophthalmic Products After Use</b><br><br>Do not touch the tip of the dispensing container to the eye or surrounding structures. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions.                                                                                                                                                                                                                                                              |
| Netarsudil             | RHOPRESSA                          | 9/2024                 | Warnings and Precautions                         | <b>Epithelial Corneal Edema</b><br><br>Epithelial corneal edema, described as honeycomb or bullous, has been reported in some patients with pre- existing corneal stromal edema or following ocular procedures that could affect corneal endothelial function. Epithelial corneal edema typically resolves upon discontinuation of RHOPRESSA. Advise patients to notify their physician if they experience eye pain or decreased vision while using RHOPRESSA.                                                                 |
| Latanoprost/Netarsudil | ROCKLATAN                          | 1/2025                 | Warnings and Precautions                         | <b>Epithelial Corneal Edema</b><br><br>ROCKLATAN contains netarsudil which has been associated with epithelial corneal edema, described as honeycomb or bullous, and has been reported in some patients with pre-existing corneal stromal edema or following ocular procedures that could affect corneal endothelial function. Epithelial corneal edema typically resolves upon discontinuation of ROCKLATAN. Advise patients to notify their physician if they experience eye pain or decreased vision while using ROCKLATAN. |

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## References:

1. Zhang D, Ren C, Wang X, et al. Treatment of glaucoma with drug-loaded contact lenses: A systematic review and meta-analysis. *Eur J Pharmacol.* 995:177425.
2. Shaikh O, Kuziez L, Saeedi OJ, Abbasian J, Elhusseiny AM. Topical Netarsudil in Childhood Glaucoma: A Systematic Review. *Curr Eye Res.* 50(5):461-466.
3. Martinez-de-la-Casa J, Corsino P, Grzybowski A, Tatham A, Vignesh SO, Hassan T. Latanoprost/timolol fixed-dose combination: two decades of efficacy and safety in glaucoma management. *BMC ophthalmol.* 26(1):14.
4. Lin JB, Harris JM, Baldwin G, Goss D, Margeta MA. Ocular effects of Rho kinase (ROCK) inhibition: a systematic review. *Eye.* 38(18):3418-3428.
5. Pazos M, Traverso CE, Viswanathan A. European Glaucoma Society - Terminology and guidelines for glaucoma, 6th Edition. *Br J Ophthalmol.* Sep 8 2025;109(Suppl 1):1-212. doi:10.1136/bjophthalmol-2025-egsguidelines
6. National Institute for Health and Care Excellence. Latanoprost-netarsudil for previously treated primary open angle glaucoma or ocular hypertension. October 2024. <https://www.nice.org.uk/guidance/ta1009> Accessed May 6, 2026.
7. Food and Drug Administration. Drug Safety Labeling Changes (SLC). <https://www.accessdata.fda.gov/scripts/cder/safetylabelingchanges/>. Accessed May 6, 2026.

**Appendix 1: Current Preferred Drug List**

| <u>Generic</u>                 | <u>Brand</u>                 | <u>Form</u> | <u>PDL</u> |
|--------------------------------|------------------------------|-------------|------------|
| betaxolol HCl                  | BETAXOLOL HCL                | DROPS       | Y          |
| brinzolamide                   | AZOPT                        | DROPS SUSP  | Y          |
| brinzolamide                   | BRINZOLAMIDE                 | DROPS SUSP  | Y          |
| carteolol HCl                  | CARTEOLOL HCL                | DROPS       | Y          |
| dorzolamide HCl/timolol maleat | COSOPT                       | DROPS       | Y          |
| dorzolamide HCl/timolol maleat | DORZOLAMIDE-TIMOLOL          | DROPS       | Y          |
| dorzolamide/timolol/PF         | COSOPT PF                    | DROPERETTE  | Y          |
| dorzolamide/timolol/PF         | DORZOLAMIDE-TIMOLOL          | DROPERETTE  | Y          |
| latanoprost                    | LATANOPROST                  | DROPS       | Y          |
| latanoprost                    | XALATAN                      | DROPS       | Y          |
| pilocarpine HCl                | PILOCARPINE HCL              | DROPS       | Y          |
| timolol maleate                | TIMOLOL MALEATE              | DROPS       | Y          |
| timolol maleate                | TIMOPTIC                     | DROPS       | Y          |
| travoprost                     | TRAVATAN Z                   | DROPS       | Y          |
| travoprost                     | TRAVOPROST                   | DROPS       | Y          |
| acetylcholine chloride         | MIOCHOL-E                    | KIT         | N          |
| apraclonidine HCl              | IOPIDINE                     | DROPERETTE  | N          |
| apraclonidine HCl              | APRACLONIDINE HCL            | DROPS       | N          |
| betaxolol HCl                  | BETOPTIC S                   | DROPS SUSP  | N          |
| bimatoprost                    | BIMATOPROST                  | DROPS       | N          |
| bimatoprost                    | LUMIGAN                      | DROPS       | N          |
| brimonidine tartrate           | ALPHAGAN P                   | DROPS       | N          |
| brimonidine tartrate           | BRIMONIDINE TARTRATE         | DROPS       | N          |
| brimonidine tartrate/timolol   | BRIMONIDINE TARTRATE-TIMOLOL | DROPS       | N          |
| brimonidine tartrate/timolol   | COMBIGAN                     | DROPS       | N          |
| brinzolamide/brimonidine tart  | SIMBRINZA                    | DROPS SUSP  | N          |
| carbachol                      | MIOSTAT                      | VIAL        | N          |
| dorzolamide HCl                | DORZOLAMIDE HCL              | DROPS       | N          |
| dorzolamide HCl                | TRUSOPT                      | DROPS       | N          |
| latanoprost/PF                 | IYUZEH                       | DROPERETTE  | N          |
| latanoprostene bunod           | VYZULTA                      | DROPS       | N          |
| levobunolol HCl                | LEVOBUNOLOL HCL              | DROPS       | N          |
| netarsudil mesylat/latanoprost | ROCKLATAN                    | DROPS       | N          |
| netarsudil mesylate            | RHOPRESSA                    | DROPS       | N          |
| tafluprost/PF                  | TAFLUPROST                   | DROPERETTE  | N          |
| tafluprost/PF                  | ZIOPTAN                      | DROPERETTE  | N          |
| timolol                        | BETIMOL                      | DROPS       | N          |
| timolol                        | TIMOLOL                      | DROPS       | N          |

|                    |                  |            |   |
|--------------------|------------------|------------|---|
| timolol maleate    | ISTALOL          | DROP DAILY | N |
| timolol maleate    | TIMOLOL MALEATE  | DROP DAILY | N |
| timolol maleate    | TIMOLOL MALEATE  | SOL-GEL    | N |
| timolol maleate    | TIMOPTIC-XE      | SOL-GEL    | N |
| timolol maleate/PF | TIMOLOL MALEATE  | DROPERETTE | N |
| timolol maleate/PF | TIMOPTIC OCUDOSE | DROPERETTE | N |
| bimatoprost        | DURYSTA          | IMPLANT    |   |
| travoprost         | IDOSE TR         | IMPLANT    |   |

## Appendix 2: Medline Search Strategy

Ovid MEDLINE(R) ALL <1946 to May 01, 2026>

|    |                                                                                           |        |
|----|-------------------------------------------------------------------------------------------|--------|
| 1  | Betaxolol/                                                                                | 687    |
| 2  | Carbonic Anhydrase Inhibitors/ or brinzolamide.mp.                                        | 6270   |
| 3  | Carteolol/                                                                                | 348    |
| 4  | dorzolamide.mp.                                                                           | 1307   |
| 5  | Latanoprost/                                                                              | 1671   |
| 6  | Pilocarpine/                                                                              | 7593   |
| 7  | Timolol/                                                                                  | 3994   |
| 8  | Travoprost/                                                                               | 503    |
| 9  | Acetylcholine/                                                                            | 51228  |
| 10 | Adrenergic alpha-2 Receptor Agonists/ or apraclonidine.mp. or Adrenergic alpha-Agonists/  | 13509  |
| 11 | Bimatoprost/                                                                              | 634    |
| 12 | Brimonidine Tartrate/                                                                     | 1647   |
| 13 | Carbachol/                                                                                | 13936  |
| 14 | Levobunolol/                                                                              | 246    |
| 15 | netarsudil.mp. or Protein Kinase Inhibitors/                                              | 68083  |
| 16 | tafluprost.mp. or Prostaglandins F/                                                       | 7892   |
| 17 | Timolol/ or Brimonidine Tartrate, Timolol Maleate Drug Combination/                       | 3994   |
| 18 | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 | 171272 |
| 19 | Glaucoma/                                                                                 | 44749  |
| 20 | 18 and 19                                                                                 | 2976   |
| 21 | limit 20 to (english language and humans and yr="2023 -Current")                          | 120    |

**Appendix 3: Key Inclusion Criteria**

|                     |                                             |
|---------------------|---------------------------------------------|
| <b>Population</b>   | People with Glaucoma                        |
| <b>Intervention</b> | Ophthalmic Preparations in Appendix 1       |
| <b>Comparator</b>   | Other ophthalmic preparations in Appendix 1 |
| <b>Outcomes</b>     | Reduction in intraocular pressure by 25-30% |
| <b>Setting</b>      | Outpatient                                  |