INDIAN HEALTH SERVICE
National Pharmacy and Therapeutics Committee
Formulary Brief: *Open-Angle Glaucoma*

-November 2025-

Background:

The Indian Health Service (IHS) National Pharmacy and Therapeutics Committee (NPTC) recently conducted a comprehensive review of pharmacotherapeutic agents for primary open-angle glaucoma (POAG). Currently, the IHS National Core Formulary (NCF) includes a prostaglandin analog (any product) for glaucoma management. Recent clinical trials, such as the Laser in Glaucoma and Ocular Hypertension Trial (LiGHT), have demonstrated that selective laser trabeculoplasty (SLT) is at least as effective as topical medications for initial therapy and may be considered first-line treatment.[1-3] The NPTC reviewed available evidence and current guidelines, including from the American Academy of Ophthalmology and the National Institute for Health and Care Excellence (NICE) for the management of POAG.[2-3] Following clinical review and analysis, the NPTC voted to **ADD (1) timolol** and **ADD a fixed-combination agent (2) dorzolamide/timolol or brimonidine/timolol** to the NCF.

Discussion:

Primary open-angle glaucoma is a chronic, progressive optic neuropathy and a leading cause of irreversible blindness worldwide, affecting over 4.2 million people in the United States alone and an estimated 76 million globally.[4,5] The primary goal of treatment is to lower intraocular pressure (IOP) and prevent further optic nerve damage. The 2019 LiGHT study, a multicenter randomized controlled trial (RCT), found that SLT achieved target IOP without medication at 3 years in 74.2% of patients with same or better IOP lowering.[1] SLT was also associated with fewer adverse events and greater cost-effectiveness over time. As a result, SLT is now recommended as a first-line treatment option by NICE and endorsed by other major guidelines.[2]

However, access to SLT may be limited due to resource availability, patient preference, or clinical contraindications. In these situations, topical pharmacologic therapy remains essential. Prostaglandin analogs are widely considered first-line topical agents, offering an average IOP reduction of 25-33% from baseline in clinical trials.[6] Timolol, a non-selective beta-blocker, has demonstrated IOP reductions of 20-30% and is cost-effective and well-tolerated. Fixed-combination agents such as dorzolamide/timolol or brimonidine/timolol provide additional IOP lowering, averaging 27-34% reduction, and simplify dosing regimens, which is crucial for improving adherence.[7-9] Adherence to therapy is a major predictor of treatment success, with studies showing rates of disease progression are up to 60% higher in patients with poor adherence.[10]

Guidelines recommend a stepwise approach: SLT as first-line where available, followed by topical agents when SLT is not an option or as adjunctive therapy. Fixed-combination products are preferred over multiple separate bottles when more than one agent is required due to improved adherence and reduced preservative exposure.[1-3]

Most adverse events with topical agents are mild and localized, though systemic effects are possible, particularly with beta-blockers. Education and regular monitoring are essential for optimizing outcomes and minimizing risks.

Findings:

The LiGHT study and subsequent research support SLT as a highly effective and cost-saving first-line therapy for POAG, achieving medication-free IOP control in nearly three-quarters of patients even after 6-years.[10] When SLT is not available, not tolerated, or not preferred, topical pharmacologic therapy remains indispensable. Prostaglandin analogs, timolol, and fixed-combination agents (dorzolamide/timolol or brimonidine/timolol) have robust evidence for efficacy, with mean IOP reductions ranging from 20% to 34% and well-characterized safety profiles. Fixed-combination drops, when compared with multiple, single-drug (non-fixed) ophthalmic products, improve adherence (69.6% vs 48.6%, $p<0.0001$) rates and greater adherence is associated with less visual field loss/progression ($p=0.007$).[11] Adding timolol and a fixed-combination ophthalmic agent to the NCF will align the IHS drug formulary with national and international guidelines, improve individualized care, and support optimal outcomes for the IHS patient population.

If you have any questions regarding this document, please contact the NPTC at IHSNPTC1@ihs.gov . For more information about the NPTC, please visit the NPTC website.

References:

1. Gazzard G, Konstantakopoulou E, Garway-Heath DF, et al. Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiGHT): a multicentre randomised controlled trial. Lancet. 2019;393(10180):1505-16.
2. NICE. Glaucoma: diagnosis and management. NICE guideline [NG81]. London: National Institute for Health and Care Excellence; 2017. Last updated January 2022.

3. American Academy of Ophthalmology. Primary Open-Angle Glaucoma Preferred Practice Pattern. San Francisco, CA: AAO; 2020.
4. Tham YC, Li X, Wong TY, et al. Global prevalence of glaucoma and projections of glaucoma burden through 2040. Ophthalmology. 2014;121(11):2081-90.
5. Centers for Disease Control and Prevention. Glaucoma Prevalence Estimates. Atlanta, GA: Centers for Disease Control and Prevention; 2022 [cited 2025 Nov 7].
6. Hedman K, Alm A. Efficacy and tolerability of prostaglandin analogs: a systematic review. Acta Ophthalmol. 2013;91(5):435-44.
7. Zimmerman TJ, Kaufman HE. Timolol maleate: a one-year double-blind study of efficacy and safety. Arch Ophthalmol. 1979;97(8):1437-42.
8. Realini T, Fechtner RD, Atreides SP, et al. Fixed-combination brimonidine-timolol in open-angle glaucoma and ocular hypertension: a randomized trial. Am J Ophthalmol. 2005;139(2):246-52.
9. Inoue K, Okayama R, Higa R, et al. Efficacy and safety of dorzolamide/timolol fixed combination in patients with primary open-angle glaucoma. J Glaucoma. 2008;17(7):595-9.
10. Gazzard G, Konstantakopoulou E, Garway-Heath D, et al. LiGHT trial extension: 6-year outcomes of selective laser trabeculoplasty vs eye drops. Br J Ophthalmol. 2023;107(3):352-358.
11. Newman-Casey PA, Wu S, Niziol LM, et al. The association between medication adherence and visual field progression in the Collaborative Initial Glaucoma Treatment Study. Ophthalmology. 2020;127(4):477-83.