

THE GLAUCOMA ISSUE

Five essential articles to keep you current.

STRATIFYING GLAUCOMA RISK AND STAGE



Pivotal studies offer guidance on clinical decisions.

BY AUSTIN R. LIFFERTH, OD, FAAO, DIPLOMATE (GLAUCOMA) AAO

Glaucoma spans from asymptomatic ocular hypertension (OHT) and suspected disease to symptomatic, advanced disease. Navigating the stages of glaucoma along this spectrum, for both diagnosis and treatment purposes, requires another type of GPS guidance, as in evidence from *glaucoma pivotal studies* “GPS,” to determine the best course of treatment.

PROCEED TO THE ROUTE

The diagnostic journey begins with a systematic evaluation of the optic nerve head.¹ Upon diagnosis, patients with glaucoma have an average life expectancy of 9 to 13 years,² and if the goal is to preserve visual function during their lifetime, then the optic nerve should be evaluated for glaucomatous damage at every visit.

At the early end of the glaucoma disease spectrum, patients generally have healthy optic discs and normal visual fields. If they have unmedicated

IOP ranging between 24 mm Hg and 32 mm Hg in one eye and between 21 mm Hg and 32 mm Hg in the fellow eye, the Ocular Hypertension Treatment Study showed that more than 90% of these individuals will not develop glaucoma during the next 5 years,³ and observation alone may be sufficient for these patients. The presence of additional risk factors, however, such as a thin central cornea, indicate an increased risk of developing glaucoma and may warrant the initiation of glaucoma treatment.³

Other patients exhibit early glaucomatous damage at diagnosis. If they are between 50 and 80 years of age and have mild glaucoma in at least one eye and a median IOP of 20 mm Hg, the results of the Early Manifest Glaucoma Trial suggest that IOP-lowering therapy be initiated. The Early Manifest Glaucoma Trial found that the risk of disease progression decreased by approximately 10% with each 1 mm Hg reduction in IOP.⁴ The study also found that disease progression varied dramatically among patients, especially in those with exfoliation syndrome;⁵ therefore, clinicians should be proactive about the testing and treatment of individuals with early glaucoma. Baseline testing and treatment strongly influence each patient’s glaucoma journey.

When determining how to care for patients with normal-tension glaucoma, providers can use the Collaborative Normal-Tension Glaucoma Study as a map. The study found that reducing IOP by 30% significantly slowed disease progression over the course of 5 years. The Collaborative Normal-Tension Glaucoma Study also showed that disease progression was more likely to be detected earlier after at least five visual field tests, so it is important to test

AT A GLANCE

- ▶ It can be helpful to pause periodically to reassess a patient’s situation, discuss it with them, and adjust the management route as appropriate.
- ▶ Starting with a baseline evaluation, structural and functional testing helps document a patient’s journey with glaucoma and signal when the disease is progressing.

these patients frequently and to tailor treatment accordingly.⁶

AVOID TOLLS

When a patient is at risk of experiencing vision loss during their lifetime, the eye care provider must determine the best treatment route.

Although the UK Glaucoma Treatment Study proved that first-line therapy with a topical prostaglandin decreased the frequency of visual field progression in patients with open-angle glaucoma (OAG) compared with placebo,⁷ don't forget to look for the LIGHTed signs along the way and consider selective laser trabeculoplasty as first-line therapy. The Laser in Glaucoma and Ocular Hypertension Trial found in more than 700 treatment-naïve patients (early to moderate OAG or OHT) over the course of 3 years that avoiding drops at the outset helps avoid side effects and helps us achieve more adherence-independent IOP reduction with maximum disease stability, IOP reduction, and quality of life compared with commonly used topical therapy.⁸

For those patients with moderate to advanced disease (worse than -10 dB), and especially if suspicious for low adherence and more rapid rate of progression, the Collaborative Initial Glaucoma Treatment Study also recommended to avoid topical therapy as the initial treatment and to highly consider surgical IOP reduction over topical medical therapy to slow further visual field loss with an average 48% and 35% IOP reduction respectively—especially in treatment-naïve patients who often fared better in their recovery.^{9,10}

If surgery is recommended, which type of surgery is best for these patients with more moderate to advanced glaucoma? The Tube Versus Trabeculectomy Study found that both surgical options had similar late or serious postoperative complications over the course of 5 years between the two treatment groups with a slightly higher long-term rate of success (and

lower rate of early postoperative complications and re-operation rates for glaucoma) with tubes, while the trabeculectomy plus mitomycin C group achieved better early pressure control within the first few months and associated less use of adjunctive medical therapy within the first few years.¹¹

ADD A STOP

It can be helpful, particularly when glaucoma reaches an advanced stage, to pause periodically to reassess the patient's situation, discuss it with them, and adjust the management route as appropriate. The Advanced Glaucoma Intervention Study clearly showed that a low mean IOP (ideally < 12 mm Hg) was associated with a significantly lower risk of visual field progression.¹² This information, coupled with follow-up testing to determine a given patient's rate of disease progression, dictates the direction that their journey will take.

REPORT AN INCIDENT

Gonioscopy is essential for differentiating between patients with primary OAG and patients at risk for angle-closure glaucoma. Such testing is particularly important when an incident such as elevated IOP or functional or structural damage is detected because narrow angles may be a factor.

Is a prophylactic, widespread laser peripheral iridotomy advisable for primary angle-closure (PAC) suspects—those patients with at least 6 clock hours of no visible trabecular meshwork on gonioscopy, normal IOP, and no peripheral anterior synchia or glaucoma? The answer is “no,” based on the Zhongshan Angle Closure Prevention Trial, which found less than a 1% incidence of PAC over the course of 6 years in 889 untreated eyes with PAC.¹³

The Early Lens Extraction for the Treatment of Primary Angle-Closure Glaucoma Study, which included 419 patients 50 years of age and older who had PAC with an IOP of at least 30 mm Hg or primary angle-closure

glaucoma, found that clear lens extraction was more efficacious and more cost-effective than laser peripheral iridotomy. Based on these findings, the investigators concluded that clear lens extraction should be considered as a first-line treatment in this population for maximum IOP control and quality of life.¹⁴

WHEN IN DOUBT, CONSULT THE MAP

When you have a patient with suspected or confirmed glaucoma and you seek direction regarding their care, don't underestimate the value of GPS. Evidence from these studies can lead us away from less-than-ideal treatment situations and toward more successful outcomes. ■

1. Sihota R, Sidhu T, Dada T. The role of clinical examination of the optic nerve head in glaucoma today. *Curr Opin Ophthalmol*. 2021;32(2):83-91.
2. Saunders LJ, Russell RA, Kirwan JF, McNaught AJ, Crabb DP. Examining visual field loss in patients in glaucoma clinics during their predicted remaining lifetime. *Invest Ophthalmol Vis Sci*. 2014;55(1):102-109.
3. Kass MA, Heuer DK, Higginbotham EJ, et al. The Ocular Hypertension Treatment Study: a randomized trial determines that topical ocular hypotensive medication delays or prevents the onset of primary open-angle glaucoma. *Arch Ophthalmol*. 2002;120(6):701-713; discussion 829-830.
4. Heijl A, Leske MC, Bengtsson B, Hyman L, Bengtsson B, Hussein M; Early Manifest Glaucoma Trial Group. Reduction of intraocular pressure and glaucoma progression: results from the Early Manifest Glaucoma Trial. *Arch Ophthalmol*. 2002;120(10):1268-1279.
5. Gredrum K, Heijl A, Bengtsson B. Risk of glaucoma in ocular hypertension with and without pseudoexfoliation. *Ophthalmology*. 2005;112(3):386-390.
6. Anderson DR; Normal Tension Glaucoma Study. Collaborative normal tension glaucoma study. *Curr Opin Ophthalmol*. 2003;14(2):86-90.
7. Garway-Heath DF, Crabb DP, Bunce C, et al. Latanoprost for open-angle glaucoma (UKGTS): a randomised, multicentre, placebo-controlled trial. *Lancet*. 2015;385(9975):1295-1304.
8. Gazzard G, Konstantakopoulou E, Garway-Heath D, et al; LIGHT Trial Study Group. 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):1505-1516.
9. Musch DC, Lichter PR, Guire KE, Standardi CL. The Collaborative Initial Glaucoma Treatment Study: study design, methods, and baseline characteristics of enrolled patients. *Ophthalmology*. 1999;106(4):653-662.
10. Lichter PR, Musch DC, Gillespie BW, et al; CIGTS Study Group. Interim clinical outcomes in the Collaborative Initial Glaucoma Treatment Study comparing initial treatment randomized to medications or surgery. *Ophthalmology*. 2001;108(11):1943-1953.
11. Gedde SJ, Schiffman JC, Feuer WJ, Herndon LW, Brandt JD, Budenz DL; Tube Versus Trabeculectomy Study Group. Three-year follow-up of the tube versus trabeculectomy study. *Am J Ophthalmol*. 2009;148(5):670-684.
12. Ederer F, Gaasterland DE, Sullivan EK, AGIS Investigators. The Advanced Glaucoma Intervention Study (AGIS): 1. Study design and methods and baseline characteristics of study patients. *Control Clin Trials*. 1994;15(4):299-325.
13. He M, Jiang Y, Huang S, et al. Laser peripheral iridotomy for the prevention of angle closure: a single-centre, randomised controlled trial. *Lancet*. 2019;393(10181):1609-1618.
14. Azuara-Blanco A, Burr J, Ramsay C, et al; EAGLE study group. Effectiveness of early lens extraction for the treatment of primary angle-closure glaucoma (EAGLE): a randomised controlled trial. *Lancet*. 2016;388(10052):1389-1397.

AUSTIN R. LIFFERTH, OD, FFAO, DIPLOMATE (GLAUCOMA) AAO

- Consultive optometrist and Residency Director, Center for Sight, Carmel, Indiana
- glaucomaqd@yahoo.com
- Financial disclosure: None