

Subject: Laser Trabeculoplasty and Laser Peripheral Iridotomy
Guideline #: CG-SURG-100
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Description

This document addresses the use of laser trabeculoplasty and laser peripheral iridotomy.

Note: For information about other proposed treatments of glaucoma see:

- [MED.00118 Continuous Monitoring of Intraocular Pressure](#)
- [SURG.00095 Viscocanalostomy and Canaloplasty](#)

Clinical Indications

Medically Necessary:

Laser trabeculoplasty is considered **medically necessary** for glaucoma in the following situations:

- As initial treatment of newly diagnosed glaucoma;**or**
- As treatment for medically refractory glaucoma;**or**
- As treatment for individuals who are at high risk for nonadherence to medical therapy (for example, those who cannot tolerate medications or who are noncompliant with medications due to memory problems or have difficulty with instillation).

Laser peripheral iridotomy is considered **medically necessary** in the following situations:

- Individuals with primary angle-closure or primary angle-closure glaucoma.

Not Medically Necessary:

Laser trabeculoplasty is considered **not medically necessary** when the above criteria are not met and for all other indications.

Laser peripheral iridotomy is considered **not medically necessary** when the above criteria are not met and for all other indications.

Coding

The following codes for treatments and procedures applicable to this guideline are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Laser Trabeculoplasty

When services may be Medically Necessary when criteria are met:

CPT

65855	Trabeculoplasty by laser surgery
0621T	Trabeculostomy ab interno by laser
0622T	Trabeculostomy ab interno by laser; with use of ophthalmic endoscope

ICD-10 Procedure

08523ZZ	Destruction of right anterior chamber, percutaneous approach
08533ZZ	Destruction of left anterior chamber, percutaneous approach

ICD-10 Diagnosis

H40.061-H40.069	Primary angle closure without glaucoma damage
H40.10X0-H40.159	Open-angle glaucoma
H40.20X0-H40.249	Primary angle-closure glaucoma
H40.30X0-H40.33X4	Glaucoma secondary to eye trauma
H40.40X0-H40.43X4	Glaucoma secondary to eye inflammation
H40.50X0-H40.53X4	Glaucoma secondary to other eye disorders
H40.60X0-H40.63X4	Glaucoma secondary to drugs
H40.811-H40.89	Other glaucoma
H40.9	Unspecified glaucoma
H42	Glaucoma in diseases classified elsewhere

When services are Not Medically Necessary:

For the procedure and diagnosis codes listed above when criteria are not met or for all other diagnoses not listed.

Laser peripheral iridotomy

When services may be Medically Necessary when criteria are met:

CPT

66761	For the following procedure codes when specified as laser peripheral iridotomy: Iridotomy/iridectomy by laser surgery (eg, for glaucoma) (per session) <i>[when specified as laser peripheral iridotomy]</i>
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ICD-10 Procedure

085C3ZZ	Destruction of right iris, percutaneous approach
085D3ZZ	Destruction of left iris, percutaneous approach
ICD-10 Diagnosis	
H40.031-H40.039	Anatomical narrow angle (primary angle closure suspect)
H40.061-H40.069	Primary angle closure without glaucoma damage
H40.20X0-H40.249	Primary angle-closure glaucoma

When services are Not Medically Necessary:

For the procedure and diagnosis codes listed above when criteria are not met or for all other diagnoses not listed.

Discussion/General Information

Glaucoma is a group of diseases which can damage the eye's optic nerve and result in vision loss or blindness. According to the American Academy of Ophthalmology (AAO) 2020 Preferred Practice Pattern® (PPP) on primary glaucoma, it is the second leading cause of blindness, with approximately 76 million affected worldwide. In the United States, an estimated 2% of people over 40 have primary open-angle glaucoma (POAG), the most common type of glaucoma. Glaucoma is typically not associated with pain or discomfort but leads to visual field loss.

Glaucoma is a progressive optic neuropathy characterized by increased intraocular pressure (IOP) and resulting optic nerve damage and loss of retinal ganglion cells and their axons. The increased IOP in POAG is thought to be caused by an increased resistance to aqueous outflow through the trabecular meshwork. Treatment is aimed at slowing progression by decreasing IOP and can include medications or surgery.

In contrast, the increased IOP in closed-angle glaucoma is related to obstruction in the aqueous outflow. Apposition of the iris results in an anatomically closed angle (Weinreb, 2014). Treatment is directed at widening the angle and preventing further angle closure. If the angle is suddenly obstructed, IOP can increase rapidly. This condition is referred to as acute angle-closure crisis or acute primary angle closure. This is an urgent situation that can lead to permanent vision loss or blindness without prompt treatment. Laser peripheral iridotomy uses a laser to cut into the iris thereby creating a hole through which aqueous humor can reach the angle and drain from the eye.

Closed-angle glaucoma is one of several classifications which fall under primary angle closure disease. The AAO PPP (2020) for primary angle closure disease includes the following classifications:

- Primary angle closure suspect: 180 degrees or greater iridotrabecular contact without IOP elevation, peripheral anterior synechiae or optic nerve damage
- Primary angle closure: 180 degrees or greater iridotrabecular contact with IOP elevation or peripheral anterior synechiae
- Primary angle closure glaucoma: 180 degrees or greater iridotrabecular contact with IOP elevation or peripheral anterior synechiae and the presence of glaucomatous optic neuropathy

Laser Trabeculoplasty

In the management of POAG, the goal is to reduce the IOP to slow the development of optic nerve damage. The IOP can be reduced by medical treatment or surgery (alone or in combination). Surgical procedures may be indicated in individuals with glaucoma when the target IOP cannot be reached pharmacologically. One option is laser trabeculoplasty, a procedure that can lead to tissue remodeling and improved aqueous humor outflow to reduce IOP.

In a 2019 randomized controlled trial (RCT) by Gazzard and colleagues, the authors reported on laser therapy to treat individuals with newly diagnosed untreated open-angle glaucoma or ocular hypertension (Laser in Glaucoma and Ocular Hypertension (LIGHT) Trial). Participants were randomized in a 1:1 fashion to receive either eye drops or laser trabeculoplasty. The included participants had visual acuity of 6/36 or better with no previous history of intraocular surgery. Individuals were monitored for 36 months. Primary outcome was health-related quality of life using the EuroQol EQ-5D 5 Levels (EQ-5D-5L). Secondary outcomes were disease-specific health-related quality of life (assessed by the Glaucoma Utility Index, Glaucoma Symptom Scale, Glaucoma Quality of Life-15 questionnaire), clinical effectiveness (proportion of visits at target intraocular pressure and the number of treatment escalations), visual function (visual acuity and fields), and safety. There were 718 participants enrolled with 356 in the selective laser trabeculoplasty group and 362 in the eye drops group. At 36 months, 652 participants returned the primary outcome questionnaire. The average EQ-5D score was 0.89 in the surgery group versus 0.90 in the eye drops group. At 36 months, 74.2% of participants in the surgery group did not require eye drops to maintain target intraocular pressure. The participants in the surgery group were within target intraocular pressure at more visits (93%) versus the eye drops group (91.3%). The groups had similar Glaucoma Utility Index scores, Glaucoma Symptom Scale scores, endpoint visual acuity, intraocular pressure, and visual field loss mean deviation. Serious adverse events were also similar between the two groups. While the scores were similar after 36 months, the questionnaires suggested better health-related quality-of-life outcomes for the surgery group.

The 6-year results of the LIGHT trial reported on the clinical effectiveness of the selective laser trabeculoplasty compared to the IOP-lowering eye drops (Gazzard, 2022). A total of 524 individuals (82.8% of those enrolled in the extension phase) reported improved long-term disease control compared to eye drop therapy. There were significantly fewer eyes in the surgery group that demonstrated progression from ocular hypertension to open-angle glaucoma or deterioration of open-angle glaucoma, compared to those treated with eye drops (19.6% compared to 26.8%; $p=0.006$). At 72 months, 69.8% of eyes treated with selective laser trabeculoplasty achieved drop-free IOP control without incisional surgery compared to 18.0% of eyes initially treated with eye-drop therapy. The authors concluded that the positive long-term results and the safety profile of selective laser trabeculoplasty support its use as a first-line therapy along with IOP drops in the United States.

In a 2006 prospective, nonrandomized trial by McIlraith and colleagues, 61 participants (100 eyes) with newly diagnosed open-angle glaucoma or ocular hypertension were assigned to the laser trabeculoplasty treatment group (74 eyes) or the control group (26 eyes) which received latanoprost. Follow-up visits were done at 1, 3, 6, and 12 months. In the surgery treatment group, the average post-treatment IOP was 17.8, the average absolute reduction in IOP was 8.3 mm Hg, and the average percent reduction in IOP was 31.0%. In the control group, the average post-treatment IOP was 16.9, the average absolute reduction in IOP was 7.7 mm Hg, and the average percent reduction in IOP was 30.6%. There were no significant complications from those receiving surgery. With similar outcomes between the two groups, surgery appears to be as efficacious as latanoprost for individuals with newly diagnosed glaucoma.

In a 2012 randomized prospective trial by Katz and colleagues, the authors sought to compare the outcomes of laser trabeculoplasty with medical treatment as initial therapy in participants with glaucoma. There were 67 eyes (38 participants) in the laser trabeculoplasty group and 60 eyes (31 participants) in the medication group. Follow-up continued for 12 months with 54 eyes in the

surgery group (30 participants) and 48 eyes (24 participants) in the medication group available for evaluation at the 9 to 12 months follow-up window. At the last visit in the surgery group, mean IOP was 18.2 mm Hg (a 6.3 mm Hg reduction) and 17.7 mm Hg (7.0 mm Hg reduction) in the medication group. Compared to baseline, the surgery group had an IOP reduction of 26.4% while the medication group had a 27.8% IOP reduction. With no statistically significant differences between the surgery group and the medication group, the study shows laser trabeculoplasty to be as efficacious as medical therapy for treatment of glaucoma.

In 2020, Ang and colleagues reported on an RCT in which participants with treatment naïve mild-to-moderate primary open-angle or exfoliation glaucoma received either selective laser trabeculoplasty (n=83) or eye drops (n=84). Primary outcome for quality of life was assessed using the Glaucoma Outcomes Assessment Tool (GOAT). Secondary outcomes included intraocular pressure reduction of greater than 25% from baseline and presence of ocular surface disease. There were 75 selective laser trabeculoplasty and 70 medication-treated participants available at 24-month follow-up. The participants in the selective laser trabeculoplasty group reported a 0.27 ± 0.81 logit mean improvement in 'social well-being' scores at 24 months compared to a -0.01 ± 0.74 mean logit reduction in the medication group. Intraocular pressure reduction of greater than 25% was achieved by 62.3% of participants in the medication group and 45.5% of participants in the trabeculoplasty group at 12 months. At 24 months, 72.1% of participants in the medication group had reduction in intraocular pressure compared to 53.4% in the surgery group. At 12 months, ocular surface disease was found in 8/67 participants in the medication group and 10/74 participants in the surgery group. The 24-month visit found 8/62 participants with ocular surface disease in the medication group and 12/69 participants in the surgery group. The authors note that selective laser trabeculoplasty was not superior to medication in improving quality of life and not superior in reducing intraocular pressure, however a greater percentage of participants in the medication group had ocular surface disease. Study limitations include not meeting the target sample size, lack of documentation of medication side effects, and a lack of standardization as surgery was performed by different clinicians using different instruments. While this study did not show superiority of surgery over medication in improving glaucoma-specific quality of life, it did show superiority over medication in ocular surface disease.

Chi and colleagues (2020) reported on a systematic review and meta-analysis of RCTs that compared the effectiveness of selective laser trabeculoplasty and medication-only treatments for open angle glaucoma. Included were 8 RCTs randomized controlled trials encompassing 1229 participants. Follow-up periods ranged from 5 months to 5 years. Intraocular pressure reduction was reported in 7 of the randomized trials with no significant differences reported between the surgery and medication-only groups. Three of the trials reported data regarding the mean number of medications needed and noted that the surgery groups had a lower mean number of medications. Improvement of quality of life outcomes was reported by three studies. Two of the studies showed higher quality of life in the surgery group with one study showing no significant changes in quality of life between surgery and medication groups. The three studies used different ways to assess quality of life. Adverse events were reported by two studies and found that the medication-only groups had more ocular adverse events caused by glaucoma eye drops. With varying assessment tools and lack of reporting of medication compliance it was difficult to ascertain the outcomes of quality of life and adverse events. Further high-quality trials are necessary. However, the trials do show that surgery decreases the number of medications needed and was observed to be safe with fewer adverse events reported when compared to medication only.

The 2020 AAO PPP for POAG states that medical therapy is the most common initial intervention. Laser trabeculoplasty can be considered as initial or adjunctive treatment.

Current literature shows laser trabeculoplasty to be safe and efficacious for individuals with newly diagnosed glaucoma and as an alternative for those who are refractory to medication or those who cannot tolerate medications or are noncompliant with medications.

Laser Peripheral Iridotomy (LPI)

Individuals for whom half the outflow channels appear obstructed are considered to be at high risk for primary angle-closure glaucoma and are referred to as primary angle closure suspects. Many primary angle closure suspects do not ever develop glaucoma. Over a 5-year period, more than 90% of individuals with untreated ocular hypertension did not progress to glaucoma (AAO, 2020).

In a study by He and colleagues (2019), the authors reported on the efficacy of LPI in preventing the development of primary angle-closure or acute angle closure in a Chinese cohort with primary angle closure suspects. The natural history of primary angle closure suspects was possible by observation of the untreated eye. In this single-center, interventional RCT of primary angle-closure suspects, 889 participants received LPI in one randomly selected eye with the contralateral eye left untreated. Participants completed follow-up visits after 2 weeks, 6 months, 18 months, 36 months, 54 months, and 72 months with the mean follow-up of 61.1 months. The primary outcome was the incidence of primary angle closure by eyes by 72 months. In this study, primary angle closure was defined as intraocular pressure measurement above 24 mm Hg on two separate occasions, the development of at least one clock hour of peripheral anterior synechia in any quadrant, and an episode of acute angle closure. During the follow-up, there were 19 eyes treated with LPI which reached the primary study endpoint with a corresponding cumulative incidence of 4.19 per 1000 eye-years (95% confidence interval [CI], 2.67–6.57) and 36 control eyes that reached the primary study endpoint with a corresponding cumulative incidence of 7.97 per 1000 eye-years (95% CI, 5.75–11.0). There were no serious adverse events observed during the follow-up period. While this study may not be generalizable with cohorts from other ethnicities, with the low rate of progression from primary angle closure suspects to primary angle-closure the authors would not recommend LPI in primary angle closure suspects.

Baskaran and associates (2022) reported on the results of a prospective RCT which examined the efficacy of LPI in individuals with primary angle-closure suspect (PACS). A total of 480 participants with bilateral asymptomatic primary angle-closure suspect underwent laser peripheral iridotomy in one eye, the other eye was used as a control. Participants were followed yearly for 5 years for the development of primary angle closure (peripheral anterior synechiae, IOP of > 21 mm Hg, or both), acute angle closure, or primary angle-closure glaucoma. There was a significantly lower incidence rate in the LPI eyes compared to the control eyes at the end of 5 years (11.65 per 1000 eye-years compared with 21.84 per 1000 eye-years, respectively). The primary benefit of treatment was a reduction in the development of peripheral anterior synechiae. The development of peripheral anterior synechiae signals mild damage to the angle structure but is not necessarily associated with vision loss (Han, 2022). The other endpoints, progression to primary angle-closure glaucoma, an IOP of greater than 21 or acute angle closure was uncommon in both groups. There was no significant difference in the development of primary angle-closure glaucoma between the groups. The authors summarized their findings as supporting the findings of the He (2019) study that "observation without LPI is a reasonable option for PACS."

According to the AAO 2020 PPP for Primary Angle Closure Disease, LPI is indicated for eyes with primary angle closure or primary angle closure glaucoma. LPI has been offered prophylactically for primary angle closure suspects, however the evidence for this practice is poor due to a paucity of long-term observational data and the low incidence of disease progression.

Definitions

Angle closure: An event in which a blockage of the trabecular meshwork closes the anterior-chamber angle causing elevated IOP. Angle closure can be acute or chronic.

Aqueous humor (vitreous humor/fluid): A transparent fluid with low protein content secreted by the ciliary body. The fluid circulates through the pupil to the anterior chamber where it is resorbed through the trabecular meshwork into Schlemm's canal and then into

the episcleral veins. The aqueous humor provides nutrition to the anterior vitreous, lens, posterior cornea, and trabecular meshwork. It also maintains intraocular pressure and provides a route for immunoglobulins to enter the anterior segment.

Glaucoma: A grouping of diseases that can damage the optic nerve and result in vision loss and blindness.

Intraocular pressure (IOP): A fluid pressure within the eye; a measurement of the balance between the production and drainage of aqueous humor.

Iridotomy: A surgical procedure in which a hole is made in the iris.

Laser trabeculoplasty: A surgical procedure in which a laser is used to improve drainage through the trabecular meshwork.

Trabeculectomy: A surgical filtration procedure in which a portion of the trabecular meshwork is surgically removed through a superficial flap of sclera to lower the IOP by creating an alternate pathway for the aqueous fluid to flow from the anterior chamber to a bleb created in the subconjunctival space.

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Peer Reviewed Publications:

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2. Baskaran M, Kumar RS, Friedman DS, et al. The Singapore asymptomatic narrow angles laser iridotomy study: Five-year results of a randomized controlled trial. *Ophthalmology*. 2022; 129(2):147-158.
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4. Gazzard G, Konstantakopoulou E, Garway-Heath D, 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):1505-1516.
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6. Han Y. Evolution of management on primary angle-closure suspect: Observation versus laser peripheral iridectomy. *Ophthalmology*. 2022; 129(2):159-160.
7. 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.
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9. McIlraith I, Strasfeld M, Colev G, Hutnik CM. Selective laser trabeculoplasty as initial and adjunctive treatment for open-angle glaucoma. *J Glaucoma*. 2006; 15(2):124-130.
10. Weinreb RN, Aung T, Medeiros FA. The pathophysiology and treatment of glaucoma: a review. *JAMA*. 2014; 311(18):1901-1911.

Government Agency, Medical Society, and Other Authoritative Publications:

1. American Academy of Ophthalmology (AAO). Ophthalmic Technology Assessment. Laser Peripheral Iridotomy in Primary Angle Closure. July 2018. For additional information, visit the AAO website: www.aao.org. Accessed on June 16, 2023.
2. American Academy of Ophthalmology (AAO). Preferred Practice Pattern®. For additional information, visit the AAO website: www.aao.org. Accessed on June 16, 2023.
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 - Primary angle-closure disease. 2020.
3. Bayliss JM, Ng WS, Waugh N, Azuara-Blanco A. Laser peripheral iridoplasty for chronic angle closure. *Cochrane Database Syst Rev*. 2021; f3(3):CD006746.
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5. Rolim-de-Moura CR, Paranhos A Jr, Loutfi M, et al. Laser trabeculoplasty for open-angle glaucoma and ocular hypertension. *Cochrane Database Syst Rev*. 2022; 8(8):CD003919.

Websites for Additional Information

1. American Academy of Ophthalmology. Glaucoma treatment. For additional information, visit the AAO website: <https://www.aao.org/eye-health/diseases/glaucoma-treatment>. Accessed on June 16, 2023.
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 - Facts about glaucoma. Available at: <https://www.nei.nih.gov/sites/default/files/2019-06/Facts-about-glaucoma.pdf>.
 - Types of glaucoma. Last updated September 10, 2021. Available at: <https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/glaucoma/types-glaucoma>.

Index

Glaucoma
Laser Peripheral Iridotomy
Laser Trabeculoplasty

History

Status	Date	Action
Reviewed	08/10/2023	Medical Policy & Technology Assessment Committee (MPTAC) review. Updated Discussion and References sections.
Reviewed	08/11/2022	MPTAC review. Updated Discussion, Definitions, References and Websites for Additional Information sections.
Reviewed	08/12/2021	MPTAC review. Updated Description, Discussion and References sections.

	12/16/2020	Updated Coding section with 01/01/2021 CPT changes; added 0621T, 0622T.
Reviewed	08/13/2020	MPTAC review. Updated Discussion/General Information and References sections. Reformatted Coding section.
Reviewed	08/22/2019	MPTAC review. Updated Definitions section.
New	06/06/2019	MPTAC review. Initial document development.

Federal and State law, as well as contract language, and Medical Policy take precedence over Clinical UM Guidelines. We reserve the right to review and update Clinical UM Guidelines periodically. Clinical guidelines approved by the Medical Policy & Technology Assessment Committee are available for general adoption by plans or lines of business for consistent review of the medical necessity of services related to the clinical guideline when the plan performs utilization review for the subject. Due to variances in utilization patterns, each plan may choose whether to adopt a particular Clinical UM Guideline. To determine if review is required for this Clinical UM Guideline, please contact the customer service number on the member's card.

Alternatively, commercial or FEP plans or lines of business which determine there is not a need to adopt the guideline to review services generally across all providers delivering services to Plan's or line of business's members may instead use the clinical guideline for provider education and/or to review the medical necessity of services for any provider who has been notified that his/her/its claims will be reviewed for medical necessity due to billing practices or claims that are not consistent with other providers, in terms of frequency or in some other manner.

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