

EFFECTIVE DATE: 03|01|2024

POLICY LAST UPDATED: 11|05|2025

OVERVIEW

Glaucoma surgery is intended to reduce intraocular pressure (IOP) when the target IOP cannot be reached with medications. Due to complications with established surgical approaches such as trabeculectomy, a variety of shunts are being evaluated as alternative surgical treatments for patients with inadequately controlled glaucoma. Microstents are also being evaluated in patients with mild-to-moderate open-angle glaucoma currently treated with ocular hypotensive medication.

MEDICAL CRITERIA

Not applicable

PRIOR AUTHORIZATION

Not applicable

POLICY STATEMENT

Medicare Advantage Plans and Commercial Products

Insertion of ab externo aqueous shunts approved by the U.S. Food and Drug Administration may be considered medically necessary as a method to reduce intraocular pressure in patients with glaucoma where medical therapy has failed to adequately control intraocular pressure.

Insertion of ab interno aqueous stents approved by the Food and Drug Administration as a method to reduce intraocular pressure in patients with glaucoma where medical therapy has failed to adequately control intraocular pressure, is considered medically necessary.

Implantation of 1 or 2 Food and Drug Administration-approved ab interno stents in conjunction with cataract surgery may be considered medically necessary in patients with mild-to-moderate open-angle glaucoma treated with ocular hypotensive medication.

Use of an ab externo aqueous shunt for all other conditions, including in patients with glaucoma when intraocular pressure is adequately controlled by medications, is not covered for Medicare Advantage Plans and is considered not medically necessary for Commercial Products as the evidence is insufficient to determine the effects of the technology on health outcomes.

Use of ab interno stents for all other indications is not covered for Medicare Advantage Plans and is considered not medically necessary for Commercial Products as the evidence is insufficient to determine the effects of the technology on health outcomes.

COVERAGE

Benefits may vary between groups/contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage, or Subscriber Agreement for applicable surgery and not covered/not medically necessary benefits/coverage.

BACKGROUND

GLAUCOMA

Glaucoma is characterized by elevated intraocular pressure (IOP), which results in visual field loss and irreversible blindness if left untreated. In the primary (conventional) outflow pathway from the eye, aqueous humor passes through the trabecular meshwork, enters a space lined with endothelial cells (Schlemm canal),

drains into collector channels, and then into the aqueous veins. Increases in resistance in the trabecular meshwork and/or the inner wall of the Schlemm canal can disrupt the balance of aqueous humor inflow and outflow, resulting in an increase in IOP and glaucoma risk.

TREATMENT

Ocular Medication

First-line treatment typically involves pharmacologic therapy. Topical medications either increase aqueous outflow (prostaglandins, alpha-adrenergic agonists, cholinergic agonists, Rho kinase inhibitors) or decrease aqueous production (alpha-adrenergic agonists, beta blockers, carbonic anhydrase inhibitors). Pharmacologic therapy may involve multiple medications, have potential side effects, and may be inconvenient for older adults or incapacitated patients.

Surgical intervention may be indicated in patients with glaucoma when the target IOP cannot be reached pharmacologically. Surgical procedures for glaucoma aim to reduce IOP from impaired aqueous humor drainage in the trabecular meshwork and/or Schlemm canal. Trabeculectomy (guarded filtration surgery) is the most established surgical procedure for glaucoma, which involves dissecting the conjunctiva, creating a scleral flap and scleral ostomy then suturing down the flap and closing the conjunctiva, allowing aqueous humor to directly enter the subconjunctival space. This procedure creates a subconjunctival reservoir, which can effectively reduce IOP, but commonly results in filtering “blebs” on the eye, and is associated with numerous complications (eg, hemorrhage, scarring, hypotony, infection, leaks, bleb-related endophthalmitis and long-term failure).

Insertion of shunts from outside the eye (ab externo) is another surgical option to lower IOP. Examples of ab externo devices cleared by the U.S. Food and Drug Administration (FDA) include the Ahmed, Baerveldt, Molteno, and EX-PRESSmini-shunt, which shunt aqueous humor between the anterior chamber and the suprachoroidal space. These devices differ by explant surface areas, shape, plate thickness, presence or absence of a valve, and details of surgical installation. Generally, the risk of hypotony (low pressure) is reduced with aqueous shunts compared with trabeculectomy, but IOP outcomes are worse than after standard guarded filtration surgery. Complications of anterior chamber shunts include corneal endothelial failure and erosion of the overlying conjunctiva. The risk of postoperative infection is lower with shunts than with trabeculectomy, and failure rates are similar (≈10% of devices fail annually). The primary indication for aqueous shunts is for failed medical or surgical therapy, although some ophthalmologists have advocated their use as a primary surgical intervention, particularly for selected conditions such as congenital glaucoma, trauma, chemical burn, or pemphigoid.

Minimally Invasive Glaucoma Surgeries (MIGS)

MIGS are alternative, less invasive techniques that are being developed and evaluated. MIGS, which use microscopic-sized equipment and smaller incisions, involves less surgical manipulation of the sclera and the conjunctiva compared with other surgical techniques. There are several categories of MIGS: miniaturized trabeculectomy, trabecular bypass, milder laser photocoagulation, and totally internal or suprachoroidal stents (ab interno). Shunts and stents can be administered through an external flap of the conjunctiva and sclera (ab externo) or in a small incision in the cornea with the devices inserted through the anterior chamber of the eye (ab interno). Some ab interno microstents may be inserted with injectors.

Examples of ab interno devices either approved or given marketing clearance by FDA include the iStent, which is a 1-mm long stent inserted into the end of the Schlemm canal through the cornea and anterior chamber; the CyPass microstent; and XEN gelatin stent.

Because aqueous humor outflow is pressure-dependent, the pressure in the reservoir and venous system is critical for reaching the target IOP. Therefore, some devices may be unable to reduce IOP below the pressure of the distal outflow system used (e.g., <15 mm Hg) and are not indicated for patients for whom very low IOP is desired (e.g., those with advanced glaucoma). It has been proposed that stents such as the iStent, CyPass, and Hydrus Microstent may be useful in patients with early-stage glaucoma to reduce

the burden of medications and problems with compliance. One area of investigation is patients with glaucoma who require cataract surgery. An advantage of ab interno stents is that they may be inserted into the same incision and at the same time as cataract surgery. Also, most devices do not preclude subsequent trabeculectomy if needed. It may also be possible to insert more than 1 stent to achieve the desired IOP. Therefore, health outcomes of interest are the IOP achieved, reduction in medications, ability to convert to trabeculectomy, complications, and durability of the device.

For individuals who have refractory OAG who receive ab externo aqueous shunts, the evidence includes randomized controlled trials (RCTs), retrospective studies, and systematic reviews. Relevant outcomes are a change in disease status, functional outcomes, medication use, and treatment-related morbidity. Randomized controlled trials assessing Food and Drug Administration (FDA) approved shunts have shown that the use of large externally placed shunts reduces IOP to slightly less than standard filtering surgery (trabeculectomy). Reported shunt success rates show that these devices are noninferior to trabeculectomy in the long term. The FDA-approved shunts have different adverse event profiles and avoid some of the most problematic complications of trabeculectomy. Two trials have compared the Ahmed and Baerveldt shunts. Both found that eyes treated with the Baerveldt shunt had slightly lower average IOP at 5 years than eyes treated with the Ahmed, but the Baerveldt also had a higher rate of serious hypotony-related complications. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have refractory OAG who receive ab interno aqueous stents, the evidence includes systematic reviews, a nonrandomized retrospective comparative study, and several single-arm studies. Relevant outcomes are a change in disease status, functional outcomes, medication use, and treatment-related morbidity. The comparative study reported that patients receiving the stent experienced similar reductions in IOP and medication use as patients undergoing trabeculectomy. The single-arm studies, with 12-month follow-up results, consistently showed that patients receiving the stents experienced reductions in IOP and medication use. Reductions in IOP ranged from 4 mm Hg to over 15 mm Hg. In addition, the FDA has given clearance to a gel stent based on equivalent IOP and medication use reductions as seen with ab externo shunts. Clearance for the stent was based on a review in which the FDA concluded that while there were technical differences between the stent and predicate devices (shunts), the differences did not affect safety and effectiveness in lowering IOP and medication use. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have mild-to-moderate OAG who are undergoing cataract surgery who receive aqueous microstents, the evidence includes RCTs and meta-analyses of RCTs. Relevant outcomes are a change in disease status, functional outcomes, medication use, and treatment-related morbidity. Implantation of 1 or 2 microstents has received FDA approval for use in conjunction with cataract surgery for reduction of IOP in adults with mild-to-moderate OAG currently treated with ocular hypotensive medication. When compared to cataract surgery alone, the studies showed modest but statistically significant decreases in IOP and medication use through the first 2 years when stents were implanted in conjunction with cataract surgery. A decrease in topical medication application is considered to be an important outcome for patients and reduces the problem of non-compliance that can affect visual outcomes. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with mild-to-moderate OAG who are not undergoing cataract surgery who receive aqueous microstents as a stand-alone procedure, the evidence includes RCTs and a systematic review of 3 heterogeneous RCTs. Relevant outcomes are a change in disease status, functional outcomes, medication use, and treatment-related morbidity. Several RCTs have evaluated the use of multiple microstents but comparators differed. Two RCTs indicate that implantation of a microstent can reduce IOP at a level similar to ocular medications at 12-month follow-up. Reduction in medications is an important outcome for patients with glaucoma. Whether microstents remain patent after 12 months is uncertain, and whether additional stents can subsequently be safely implanted is unknown. Some evidence on longer-term outcomes is provided by an RCT that compared implantation of a single iStent to implantation of multiple iStents. At longer-term (42-month) follow-up, the need for additional medication increased in eyes implanted with a single microstent but not with multiple microstents. The durability of multiple iStents is unknown. A fourth RCT

compared implantation of the Hydrus microstent to 2 iStents. Outcomes from the Hydrus microstent were significantly better than 2 iStents, both statistically and clinically, for all outcome measures. The primary limitation of this study is that the duration of follow-up in the publication is limited to 12 months. Longer-term follow-up from this study is continuing and will answer important questions on the durability of the procedure. Corroboration in an independent study and comparison with a medical therapy control group would also increase confidence in the results. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

CODING

Medicare Advantage Plans and Commercial Products

The following codes(s) are covered only when used for a covered ICD-10 Diagnosis Code(s)* listed below:

- 66179** Aqueous shunt to extraocular equatorial plate reservoir, external approach; without graft
- 66180** Aqueous shunt to extraocular equatorial plate reservoir, external approach; with graft
- 66183** Insertion of anterior segment aqueous drainage device, without extraocular reservoir; external approach
- 66184** Revision of aqueous shunt to extraocular equatorial plate reservoir; without graft
- 66185** Revision of aqueous shunt to extraocular equatorial plate reservoir; without graft
- 66989** Extracapsular cataract removal with insertion of intraocular lens prosthesis (1-stage procedure), manual or mechanical technique (eg, irrigation and aspiration or phacoemulsification), complex, requiring devices or techniques not generally used in routine cataract surgery (eg, iris expansion device, suture support for intraocular lens, or primary posterior capsulorrhexis) or performed on patients in the amblyogenic developmental stage; with insertion of intraocular (eg, trabecular meshwork, supraciliary, suprachoroidal) anterior segment aqueous drainage device, without extraocular reservoir, internal approach, one or more
- 66991** Extracapsular cataract removal with insertion of intraocular lens prosthesis (1 stage procedure), manual or mechanical technique (eg, irrigation and aspiration or phacoemulsification); with insertion of intraocular (eg, trabecular meshwork, supraciliary, suprachoroidal) anterior segment aqueous drainage device, without extraocular reservoir, internal approach, one or more
- 0253T** Insertion of anterior segment aqueous drainage device, without extraocular reservoir; internal approach, into the suprachoroidal space
- 0449T** Insertion of aqueous drainage device, without extraocular reservoir, internal approach, into the subconjunctival space; initial device
- 0450T** Insertion of aqueous drainage device, without extraocular reservoir, internal approach, into the subconjunctival space; each additional device (List separately in addition to code for primary procedure)
- 0474T** Insertion of anterior segment aqueous drainage device, with creation of intraocular reservoir, internal approach, into the supraciliary space
- 0671T** Insertion of anterior segment aqueous drainage device into the trabecular meshwork, without external reservoir, and without concomitant cataract removal, one or more

***ICD-10 Diagnosis Codes that may support medical necessity:**

H40.10X0 – H42

RELATED POLICIES

Viscocanalostomy and Canaloplasty

PUBLISHED

Provider Update, January 2026
Provider Update, February 2024
Provider Update, January 2024
Provider Update, January 2023
Provider Update, March 2022

REFERENCES

1. Allison K, Patel DG, Greene L. Racial and Ethnic Disparities in Primary Open-Angle Glaucoma Clinical Trials: A Systematic Review and Meta-analysis. *JAMA Netw Open*. May 03 2021; 4(5): e218348. PMID 34003274
2. Panarelli JF, Moster MR, Garcia-Feijoo J, et al. Ab-Externo MicroShunt versus Trabeculectomy in Primary Open-Angle Glaucoma: Two-Year Results from a Randomized, Multicenter Study. *Ophthalmology*. Mar 2024; 131(3): 266-276. PMID 37769852
3. Minckler DS, Vedula SS, Li TJ, et al. Aqueous shunts for glaucoma. *Cochrane Database Syst Rev*. Apr 19 2006; (2): CD004918. PMID 16625616
4. Tseng VL, Coleman AL, Chang MY, et al. Aqueous shunts for glaucoma. *Cochrane Database Syst Rev*. Jul 28 2017; 7(7): CD004918. PMID 28750481
5. Minckler DS, Francis BA, Hodapp EA, et al. Aqueous shunts in glaucoma: a report by the American Academy of Ophthalmology. *Ophthalmology*. Jun 2008; 115(6): 1089-98. PMID 18519069
6. Zhang X, Wang B, Liu R, et al. The effectiveness of AGV, Ex-PRESS, or trabeculectomy in the treatment of primary and secondary glaucoma: a systematic review and network meta-analysis. *Ann Palliat Med*. Jan 2022; 11(1): 321-331. PMID 35144423
7. Boland MV, Ervin AM, Friedman D, et al. Treatment for Glaucoma: Comparative Effectiveness. Comparative Effectiveness Review No. 60 (AHRQ Publication No. 12-EHC038-EF). Rockville, MD: Agency for Healthcare Research and Quality; 2012.
8. Gedde SJ, Schiffman JC, Feuer WJ, et al. Treatment outcomes in the Tube Versus Trabeculectomy (TVT) study after five years of follow-up. *Am J Ophthalmol*. May 2012; 153(5): 789-803.e2. PMID 22245458
9. Kotecha A, Feuer WJ, Barton K, et al. Quality of Life in the Tube Versus Trabeculectomy Study. *Am J Ophthalmol*. Apr 2017; 176: 228-235. PMID 28161049
10. Swaminathan SS, Jammal AA, Kornmann HL, et al. Visual Field Outcomes in the Tube Versus Trabeculectomy Study. *Ophthalmology*. Sep 2020; 127(9): 1162-1169. PMID 32327255
11. Swaminathan SS, Jammal AA, Medeiros FA, et al. Visual Field Outcomes in the Primary Tube Versus Trabeculectomy Study. *Ophthalmology*. Oct 2024; 131(10): 1157-1163. PMID 38582154
12. Wang X, Khan R, Coleman A. Device-modified trabeculectomy for glaucoma. *Cochrane Database Syst Rev*. Dec 01 2015; (12): CD010472. PMID 26625212
13. Park J, Rittiphairoj T, Wang X, et al. Device-modified trabeculectomy for glaucoma. *Cochrane Database Syst Rev*. Mar 13 2023; 3(3): CD010472. PMID 36912740
14. Netland PA, Sarkisian SR, Moster MR, et al. Randomized, prospective, comparative trial of EX-PRESS glaucoma filtration device versus trabeculectomy (XVT study). *Am J Ophthalmol*. Feb 2014; 157(2): 433-440.e3. PMID 24210765
15. de Jong LA. The Ex-PRESS glaucoma shunt versus trabeculectomy in open-angle glaucoma: a prospective randomized study. *Adv Ther*. Mar 2009; 26(3): 336-45. PMID 19337705
16. de Jong L, Lafuma A, Aguade AS, et al. Five-year extension of a clinical trial comparing the EX-PRESS glaucoma filtration device and trabeculectomy in primary open-angle glaucoma. *Clin Ophthalmol*. 2011; 5: 527-33. PMID 21607021
17. Wagschal LD, Trope GE, Jinapriya D, et al. Prospective Randomized Study Comparing Ex-PRESS to Trabeculectomy: 1-Year Results. *J Glaucoma*. Oct-Nov 2015; 24(8): 624-9. PMID 24247999
18. Gonzalez-Rodriguez JM, Trope GE, Drori-Wagschal L, et al. Comparison of trabeculectomy versus Ex-PRESS: 3-year follow-up. *Br J Ophthalmol*. Sep 2016; 100(9): 1269-73. PMID 26674779
19. Konopinska J, Byszewska A, Saeed E, et al. Phacotrabeculectomy versus Phaco with Implantation of the Ex-PRESS Device: Surgical and Refractive Outcomes-A Randomized Controlled Trial. *J Clin Med*. Jan 22 2021; 10(3). PMID 33499300
20. Tokumo K, Okada N, Onoe H, et al. Ex-PRESS Implantation versus Trabeculectomy for Long-Term Maintenance in Patients with Open-Angle Glaucoma. *Clin Ophthalmol*. 2023; 17: 2525-2537. PMID 37662650
21. Budenz DL, Barton K, Gedde SJ, et al. Five-year treatment outcomes in the Ahmed Baerveldt comparison study. *Ophthalmology*. Feb 2015; 122(2): 308-16. PMID 25439606
22. Budenz DL, Feuer WJ, Barton K, et al. Postoperative Complications in the Ahmed Baerveldt Comparison Study During Five Years of Follow-up. *Am J Ophthalmol*. Mar 2016; 163: 75-82.e3. PMID 26596400

23. Christakis PG, Kalenak JW, Tsai JC, et al. The Ahmed Versus Baerveldt Study: Five-Year Treatment Outcomes. *Ophthalmology*. Oct 2016; 123(10): 2093-102. PMID 27544023
24. Christakis PG, Zhang D, Budenz DL, et al. Five-Year Pooled Data Analysis of the Ahmed Baerveldt Comparison Study and the Ahmed Versus Baerveldt Study. *Am J Ophthalmol*. Apr 2017; 176: 118-126. PMID 28104418
25. Lim SY, Betzler BK, Yip LWL, et al. Standalone XEN45 Gel Stent implantation in the treatment of open-angle glaucoma: A systematic review and meta-analysis. *Surv Ophthalmol*. 2022; 67(4): 1048-1061. PMID 35081414
26. Yang X, Zhao Y, Zhong Y, et al. The efficacy of XEN gel stent implantation in glaucoma: a systematic review and meta-analysis. *BMC Ophthalmol*. Jul 15 2022; 22(1): 305. PMID 35836197
27. Sheybani A, Vera V, Grover DS, et al. Gel Stent Versus Trabeculectomy: The Randomized, Multicenter, Gold-Standard Pathway Study (GPS) of Effectiveness and Safety at 12 Months. *Am J Ophthalmol*. Aug 2023; 252: 306-325. PMID 36972738
28. Schlenker MB, Gulamhusein H, Conrad-Hengerer I, et al. Efficacy, Safety, and Risk Factors for Failure of Standalone Ab Interno Gelatin Microstent Implantation versus Standalone Trabeculectomy. *Ophthalmology*. Nov 2017; 124(11): 1579-1588. PMID 28601250
29. Wagner FM, Schuster AK, Emmerich J, et al. Efficacy and safety of XEN(R)-Implantation vs. trabeculectomy: Data of a "real-world" setting. *PLoS One*. 2020; 15(4): e0231614. PMID 32310972
30. Stoner AM, Capitena Young CE, SooHoo JR, et al. A Comparison of Clinical Outcomes After XEN Gel Stent and EX-PRESS Glaucoma Drainage Device Implantation. *J Glaucoma*. Jun 01 2021; 30(6): 481-488. PMID 34060508
31. Gabbay IE, Goldberg M, Allen F, et al. Efficacy and safety data for the Ab interno XEN45 gel stent implant at 3 Years: A retrospective analysis. *Eur J Ophthalmol*. May 02 2021; 11206721211014381. PMID 33938304
32. Le JT, Bicket AK, Wang L, et al. Ab interno trabecular bypass surgery with iStent for open-angle glaucoma. *Cochrane Database Syst Rev*. Mar 28 2019; 3: CD012743. PMID 30919929
33. Healey PR, Clement CI, Kerr NM, et al. Standalone iStent Trabecular Micro-bypass Glaucoma Surgery: A Systematic Review and Meta-Analysis. *J Glaucoma*. Jul 01 2021; 30(7): 606-620. PMID 33596009
34. Samuelson TW, Katz LJ, Wells JM, et al. Randomized evaluation of the trabecular micro-bypass stent with phacoemulsification in patients with glaucoma and cataract. *Ophthalmology*. Mar 2011; 118(3): 459-67. PMID 20828829
35. Craven ER, Katz LJ, Wells JM, et al. Cataract surgery with trabecular micro-bypass stent implantation in patients with mild-to-moderate open-angle glaucoma and cataract: two-year follow-up. *J Cataract Refract Surg*. Aug 2012; 38(8): 1339-45. PMID 22814041
36. Samuelson TW, Sarkisian SR, Lubeck DM, et al. Prospective, Randomized, Controlled Pivotal Trial of an Ab Interno Implanted Trabecular Micro-Bypass in Primary Open-Angle Glaucoma and Cataract: Two-Year Results. *Ophthalmology*. Jun 2019; 126(6): 811-821. PMID 30880108
37. Hooshmand J, Rothschild P, Allen P, et al. Minimally invasive glaucoma surgery: Comparison of iStent with iStent inject in primary open angle glaucoma. *Clin Exp Ophthalmol*. Sep 2019; 47(7): 898-903. PMID 31034687
38. Al Yousef Y, Strzalkowska A, Hillenkamp J, et al. Comparison of a second-generation trabecular bypass (iStent inject) to ab interno trabeculectomy (Trabectome) by exact matching. *Graefes Arch Clin Exp Ophthalmol*. Dec 2020; 258(12): 2775-2780. PMID 32960322
39. Salimi A, Watt H, Harasymowycz P. Three-Year Outcomes of Second-generation Trabecular Micro-bypass Stents (iStent inject) With Phacoemulsification in Various Glaucoma Subtypes and Severities. *J Glaucoma*. Mar 01 2021; 30(3): 266-275. PMID 33105306
40. Matsuo M, Fukuda H, Buathong J, et al. Comparison of 1-year effectiveness between phaco-microhook ab-interno trabeculotomy and phaco-iStent trabecular micro-bypass stent in primary open-angle glaucoma with low-teen intraocular pressure. *Graefes Arch Clin Exp Ophthalmol*. Aug 19 2024. PMID 39160440
41. Fan Gaskin JC, Bigirimana D, Kong GYX, et al. Prospective, Randomized Controlled Trial of Cataract Surgery vs Combined Cataract Surgery With Insertion of iStent Inject. *Ophthalmol Glaucoma*. 2024; 7(4): 326-334. PMID 38369058

42. Otarola F, Virgili G, Shah A, et al. Ab interno trabecular bypass surgery with Schlemms canal microstent (Hydrus) for open angle glaucoma. *Cochrane Database Syst Rev.* Mar 09 2020; 3: CD012740. PMID 32147807
43. Pfeiffer N, Garcia-Feijoo J, Martinez-de-la-Casa JM, et al. A Randomized Trial of a Schlemm's Canal Microstent with Phacoemulsification for Reducing Intraocular Pressure in Open-Angle Glaucoma. *Ophthalmology.* Jul 2015; 122(7): 1283-93. PMID 25972254
44. Samuelson TW, Chang DF, Marquis R, et al. A Schlemm Canal Microstent for Intraocular Pressure Reduction in Primary Open-Angle Glaucoma and Cataract: The HORIZON Study. *Ophthalmology.* Jan 2019; 126(1): 29-37. PMID 29945799
45. Ahmed IIK, Fea A, Au L, et al. A Prospective Randomized Trial Comparing Hydrus and iStent Microinvasive Glaucoma Surgery Implants for Standalone Treatment of Open-Angle Glaucoma: The COMPARE Study. *Ophthalmology.* Jan 2020; 127(1): 52-61. PMID 31034856
46. Montesano G, Ometto G, Ahmed IIK, et al. Five-Year Visual Field Outcomes of the HORIZON Trial. *Am J Ophthalmol.* Jul 2023; 251: 143-155. PMID 36813144
47. Fea AM, Ahmed II, Lavia C, et al. Hydrus microstent compared to selective laser trabeculoplasty in primary open angle glaucoma: one year results. *Clin Exp Ophthalmol.* Mar 2017; 45(2): 120-127. PMID 27449488
48. Salimi A, Kassem R, Santhakumaran S, et al. Three-Year Outcomes of a Schlemm Canal Microstent (Hydrus Microstent) with Concomitant Phacoemulsification in Open-Angle Glaucoma. *Ophthalmol Glaucoma.* 2023; 6(2): 137-146. PMID 36038108
49. Fea AM, Belda JI, Rekas M, et al. Prospective unmasked randomized evaluation of the iStent inject ((R)) versus two ocular hypotensive agents in patients with primary open-angle glaucoma. *Clin Ophthalmol.* 2014; 8: 875-82. PMID 24855336
50. Vold SD, Voskanyan L, Tetz M, et al. Newly Diagnosed Primary Open-Angle Glaucoma Randomized to 2 Trabecular Bypass Stents or Prostaglandin: Outcomes Through 36 Months. *Ophthalmol Ther.* Dec 2016; 5(2): 161-172. PMID 27619225
51. Berdahl J, Voskanyan L, Myers JS, et al. iStent inject trabecular micro-bypass stents with topical prostaglandin as standalone treatment for open-angle glaucoma: 4-year outcomes. *Clin Exp Ophthalmol.* Aug 2020; 48(6): 767-774. PMID 32311201
52. Lindstrom R, Sarkisian SR, Lewis R, et al. Four-Year Outcomes of Two Second-Generation Trabecular Micro-Bypass Stents in Patients with Open-Angle Glaucoma on One Medication. *Clin Ophthalmol.* 2020; 14: 71-80. PMID 32021070
53. Katz LJ, Erb C, Carceller GA, et al. Prospective, randomized study of one, two, or three trabecular bypass stents in open-angle glaucoma subjects on topical hypotensive medication. *Clin Ophthalmol.* 2015; 9: 2313-20. PMID 26715834
54. Katz LJ, Erb C, Carceller Guillamet A, et al. Long-term titrated IOP control with one, two, or three trabecular micro-bypass stents in open-angle glaucoma subjects on topical hypotensive medication: 42-month outcomes. *Clin Ophthalmol.* 2018; 12: 255-262. PMID 29440867
55. Sarkisian SR, Grover DS, Gallardo MJ, et al. Effectiveness and Safety of iStent Infinite Trabecular Micro-Bypass for Uncontrolled Glaucoma. *J Glaucoma.* Jan 01 2023; 32(1): 9-18. PMID 36260288
56. Gedde SJ, Vinod K, Wright MM, et al. Primary open-angle glaucoma preferred practice pattern. September 2020. <https://www.aao.org/preferred-practice-pattern/primary-open-angle-glaucoma-ppp>. Accessed Sept 25, 2024.
57. Fellman RL, Mattox C, Singh K, et al. American Glaucoma Society Position Paper: Microinvasive Glaucoma Surgery. *Ophthalmol Glaucoma.* Jan 2020; 3(1): 1-6. PMID 32672638
58. National Institute for Health and Care Evidence (NICE). Trabecular stent bypass microsurgery for open-angle glaucoma [IPG575]. 2017; <https://www.nice.org.uk/guidance/ipg575>. Accessed Sept 25, 2024.
59. National Institute for Health and Care Excellence. Microinvasive subconjunctival insertion of a trans-scleral gelatin stent for primary open-angle glaucoma. [IPG612]. 2018; <https://www.nice.org.uk/guidance/ipg612/chapter/1-Recommendations>. Accessed Sept 25, 2024.

CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS

This medical policy is made available to you for informational purposes only. It is not a guarantee of payment or a substitute for your medical judgment in the treatment of your patients. Benefits and eligibility are determined by the member's subscriber agreement or member certificate and/or the employer agreement, and those documents will supersede the provisions of this medical policy. For information on member-specific benefits, call the provider call center. If you provide services to a member which are determined to not be medically necessary (or in some cases medically necessary services which are non-covered benefits), you may not charge the member for the services unless you have informed the member and they have agreed in writing in advance to continue with the treatment at their own expense. Please refer to your participation agreement(s) for the applicable provisions. This policy is current at the time of publication; however, medical practices, technology, and knowledge are constantly changing. BCBSRI reserves the right to review and revise this policy for any reason and at any time, with or without notice. Blue Cross & Blue Shield of Rhode Island is an independent licensee of the Blue Cross and Blue Shield Association.

