

MEDICAL POLICY



MEDICAL POLICY DETAILS	
Medical Policy Title	OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)
Policy Number	9.01.06
Category	Technology Assessment
Effective Date	08/21/03
Revised Date	08/19/04, 06/16/05, 01/19/06, 01/18/07, 01/17/08, 12/18/08, 02/18/10, 11/18/10, 11/17/11, 11/15/12, 11/21/13
Archived Date	11/20/14
Edited Date	11/19/15, 11/17/16, 11/16/17, 11/15/18, 11/21/19
Product Disclaimer	<ul style="list-style-type: none"> • If a product excludes coverage for a service, it is not covered, and medical policy criteria do not apply. • If a commercial product (including an Essential Plan product) or a Medicaid product covers a specific service, medical policy criteria apply to the benefit. • If a Medicare product covers a specific service, and there is no national or local Medicare coverage decision for the service, medical policy criteria apply to the benefit.

POLICY STATEMENT

- I. Based upon our criteria and assessment of peer-reviewed literature, scanning laser polarimetry and scanning laser ophthalmoscopy are considered **medically appropriate** methods for detecting glaucoma damage to the retinal nerve fiber layer (RNFL):
 - A. In glaucoma suspects; or
 - B. For routine monitoring for progression of the disease in known glaucoma patients.
- II. Based upon our criteria and assessment of peer-reviewed literature, use of scanning laser ophthalmoscopy to evaluate the optic nerve head in patients with glaucoma that has not been investigated in scientific peer-reviewed literature (e.g., Optomap retinal exam), is considered **not medically necessary** as a method of evaluating patients with glaucoma or for evaluating other ocular conditions.

Refer to Corporate Medical Policy #9.01.10 regarding Optical Coherence Tomography for Ophthalmologic Applications.

POLICY GUIDELINES

Glaucoma is actually a group of eye diseases that lead to damage of the optic nerve and retinal nerve fiber layer in the eye and results in blindness without treatment. The retinal nerve fiber layer (RNFL) is the innermost layer of the retina and consists of ganglion cell axons, which are the target cells in glaucoma. Axonal loss in glaucoma causes visual field loss, which, however, is only detected when a considerable amount of the nerve fiber layer has been lost. It has been proposed that RNFL defects can precede optic disc and visual field damage by several years and may be the earliest sign of glaucomatous damage.

Scanning laser polarimetry (SLP) is a nerve fiber analyzer that has been developed with the aim of providing quantitative information on the thickness of the RNFL in specific regions of the peripapillary fundus. Scanning laser polarimetry depends upon the birefringent qualities of the RNFL, whereby the polarization of light is altered or retarded by its passage through the nerve fibers. The degree of change that polarization is altered is in proportion to the depth of the RNFL and is detected by a built-in polarimeter. Change in polarization or retardation is then converted into a topographical map of the RNFL thickness by computer software. GDx imager is a scanning laser polarimeter developed by Laser Diagnostic Technologies.

The scanning laser ophthalmoscope (SLO) is a device that scans the layers of the retina to make quantitative measurements of the surface features of the optic nerve head and fundus. The basic principle of SLO operation consists of

Medical Policy: OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)

Policy Number: 9.01.06

Page: 2 of 7

a low-powered laser beam, which is scanned into 2 dimensions over the retina. Light reflected from the retina is detected and transformed into a digital computer image. SLO has been proposed as an alternative to standard ophthalmologic methods of evaluating the optic nerve head and fundus in patients with glaucoma, papilledema, diabetic retinopathy or other conditions that affect the retina or optic nerve. Other terms for scanning laser ophthalmoscopy include confocal laser scanning tomography, laser scanning topography, and electro-optic fundus imaging. The Optomap retinal exam provides a digital image of the retina, similar to fundus photography and is not considered in the category of a SLO as it does not adequately evaluate the optic nerve head.

DESCRIPTION

The scanning laser ophthalmoscope differs from scanning laser polarimetry in that the SLO measures the topography, or estimates the height of the retina, while scanning laser polarimetry directly measures the thickness of the retinal nerve fiber layer by use of polarization.

A potential advantage of scanning laser technology is that it does not require maximal mydriasis or pupil dilation, which may be a problem in patients with glaucoma or children.

RATIONALE

Several devices for measuring the retinal nerve fiber layer have received FDA approval. Numerous articles continue to describe findings from patients with known and suspected glaucoma using scanning laser ophthalmoscopy and scanning laser polarimetry. Studies note that abnormalities may be detected on these examinations before functional changes are noted. These techniques have become incorporated into glaucoma care and are viewed as an additional piece of information that may be useful in the clinical management of these patients. There is data to demonstrate that this testing is equivalent to expert assessment of optic disc photography for both detecting glaucoma and showing disease progression. There are also favorable aspects of this testing. For example, in contrast to other glaucoma testing, these tests can be done more easily, e.g. this testing does not always need to be done with dilated pupils and ambient light level may be (is) less critical. In addition, while serial stereo-photographs of the optic nerves are considered by many as the gold standard, these are not always practical, especially for general ophthalmologists. This testing also requires less cooperation from the patient, which can be helpful in some older patients. In summary, the use of scanning laser ophthalmoscopy and scanning laser polarimetry has become one additional test that may be utilized in the diagnosis and management of patients with glaucoma. These results are often considered along with other findings to make diagnostic and therapeutic decisions about glaucoma care.

In 2012, the Agency for Healthcare Research and Quality (AHRQ) published a comparative effectiveness review of screening for glaucoma. Included in the review were randomized controlled trials (RCTs), quasi-randomized controlled trials, observational study designs including cohort and case control studies, and case series with more than 100 participants. The interventions evaluated included ophthalmoscopy, fundus photography/computerized imaging (OCT, retinal tomography, scanning laser polarimetry), pachymetry (corneal thickness measurement), perimetry, and tonometry. No evidence was identified that addressed whether an open angle glaucoma screening program led to a reduction in IOP, less visual impairment, reduction in visual field loss or optic nerve damage, or improvement in patient-reported outcomes. No evidence was identified regarding harms of a screening program. Over 100 studies were identified on the diagnostic accuracy of screening tests. However, due to the lack of a definitive diagnostic reference standard and heterogeneity, synthesis of results could not be completed.

There is a lack of scientific evidence from clinical studies to determine the accuracy and clinical utility of the Optomap retinal exam in screening, diagnosis or monitoring of patients with glaucoma, retinopathy, papilledema and other conditions affecting the retina and optic nerve.

CODES

- *Eligibility for reimbursement is based upon the benefits set forth in the member's subscriber contract.*
- **CODES MAY NOT BE COVERED UNDER ALL CIRCUMSTANCES. PLEASE READ THE POLICY AND GUIDELINES STATEMENTS CAREFULLY.**

Medical Policy: OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)

Policy Number: 9.01.06

Page: 3 of 7

- Codes may not be all inclusive as the AMA and CMS code updates may occur more frequently than policy updates.

CPT Codes

Code	Description
92133	Scanning computerized ophthalmic diagnostic imaging, posterior segment, with interpretation and report, unilateral or bilateral, optic nerve
92134	Scanning computerized ophthalmic diagnostic imaging, posterior segment, with interpretation and report, unilateral or bilateral, retina

Copyright © 2019 American Medical Association, Chicago, IL

HCPCS Codes

Code	Description
No specific codes	

ICD9 Codes

Code	Description
365.00-365.9	Glaucoma (code range)

ICD10 Codes

Code	Description
H40.001-H40.009	Preglaucoma, unspecified (code range)
H40.011-H40.029	Open angle with borderline findings (code range)
H40.031-H40.039	Anatomical narrow angle (code range)
H40.041-H40.049	Steroid responder (code range)
H40.051-H40.059	Ocular hypertension (code range)
H40.061-H40.069	Primary angle closure without glaucoma damage (code range)
H40.10x0-H40.10x4	Unspecified open-angle glaucoma (code range)
H40.11x0-H40.11x4	Primary open-angle glaucoma (code range)
H40.1210-H40.1294	Low tension glaucoma (code range)
H40.1310-H40.1394	Pigmentary glaucoma (code range)
H40.1410-H40.1494	Capsular glaucoma with pseudofoliation of lens (code range)
H40.1510-H40.1594	Residual stage of open-angle glaucoma (code range)
H40.20x0-H40.20x4	Unspecified primary angle-closure glaucoma (code range)
H40.211-H40.219	Acute angle-closure glaucoma (code range)
H40.2210-H40.2294	Chronic angle-closure glaucoma (code range)
H40.231-H40.239	Intermittent angle-closure glaucoma (code range)
H40.241-H40.249	Residual stage of angle-closure glaucoma (code range)
H40.30x0-H40.33x4	Glaucoma secondary to eye trauma (code range)
H40.40x0-H40.43x4	Glaucoma secondary to eye inflammation (code range)
H40.50x0-H40.53x4	Glaucoma secondary to eye disorders (code range)
H40.60x0-H40.63x4	Glaucoma secondary to drugs (code range)
H40.811-H40.819	Glaucoma with increased episcleral venous pressure (code range)
H40.821-H40.829	Hypersecretion glaucoma (code range)
H40.831-H40.839	Aqueous misdirection (code range)

Medical Policy: OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)

Policy Number: 9.01.06

Page: 4 of 7

Code	Description
H40.89	Other unspecified glaucoma
H40.9	Unspecified glaucoma
H42	Glaucoma in disease classified elsewhere
Q150	Congenital glaucoma

REFERENCES

Agency for Healthcare Research and Quality. Comparative effectiveness of screening for glaucoma. number 59. 2012 April [http://effectivehealthcare.ahrq.gov/ehc/products/182/1025/CER59_GlaucomaScreening_executivesummary.pdf] accessed 10/16/19.

*American Academy of Ophthalmology. Optic Nerve Head and Retinal Nerve Fiber Layer Analysis. OTA. 2007 Oct. [http://one.aaopt.org/ce/practiceguidelines/ophthalmic_content.aspx?cid=f58f4520-2387-4832-9ad7-b0232e4a5247] accessed 10/16/19.

American Academy of Ophthalmology Preferred Practice Pattern. Primary open-angle glaucoma suspect. 2010 Oct [http://one.aaopt.org/ce/practiceguidelines/ppp_content.aspx?cid=e2387c8a-e51c-4c21-be20-c30fbf4f3260] accessed 10/16/19.

*Bagga H, et al. Scanning laser polarimetry with variable corneal compensation and optical coherence tomography in normal and glaucomatous eyes. Am J Ophthalmol 2003 Apr;135(4):521-9.

Benitez-del-Castillo J, et al. Correlation between scanning laser polarimetry with and without enhanced corneal compensation and high-definition optical coherence tomography in normal and glaucomatous eyes. Int J Clin Pract 2011 Jul;65(7):807-16.

Bertuzzi F, et al. Diagnostic validity of optic disc and retinal nerve fiber layer evaluations in detecting structural changes after optic neuritis. Ophthalmology 2010 Jun;117(6):1256-64.

Bertuzzi F, et al. Evaluation of retinal nerve fiber layer thickness measurements for glaucoma detection: GDx ECC versus spectral-domain OCT. J Glaucoma 2014 Apr-May;23(4):232-9.

BlueCross BlueShield Association. Ophthalmologic techniques that evaluate the posterior segment for glaucoma. Medical Policy Reference Manual Policy #9.03.06. 2019 March 14.

*BlueCross BlueShield Association Technology Evaluation Center (TEC). Retinal nerve fiber layer analysis for the diagnosis and management of glaucoma. 2003 Aug;18(7).

*Bowd C, et al. Association between scanning laser polarimetry measurements using variable corneal polarization compensation and visual field sensitivity in glaucomatous eyes. Arch Ophthalmol 2003 Jul;121(7):961-6.

*Bozkuert B, et al. Scanning laser polarimetric analysis of retinal nerve fiber layer thickness in Turkish patients with glaucoma and ocular hypertension. Eur J Ophthalmol 2002 Sep-Oct;12(5):406-12.

*Chauhan BC, et al. Optic disc and visual field changes in a prospective longitudinal study of patients with glaucoma. Arch Ophthalmol 2001 Oct;119:1492-9.

Chauhan BC, et al. Incidence and rates of visual field progression after longitudinally measured optic disc change in glaucoma. Ophthalmol 2009 Nov;116(11):2110-8.

*Funaki S, et al. Specificity and sensitivity of glaucoma detection in the Japanese population using scanning laser polarimetry. Br J Ophthalmol 2002 Jan;86(1):70-4.

*Galvao Filho RP, et al. Comparison of retinal nerve fibre layer thickness and visual field loss between different glaucoma groups. Br J Ophthalmol 2005 Aug;89(8):1004-7.

*Gandorfer A, et al. Scanning laser ophthalmoscope findings in acute macular neuroretinopathy. Am J Ophthalmol 2002 Mar;133(3):413-5.

Medical Policy: OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)

Policy Number: 9.01.06

Page: 5 of 7

- *Greaney MJ, et al. Comparison of optic nerve imaging methods to distinguish normal eyes from those with glaucoma. Invest Ophthalmol Vis Sci 2002 Jan;43(1):140-5.
- *Greenfield DS, et al. Role of optic nerve imaging in glaucoma clinical practice and clinical trials. Am J Ophthalmol 2008 Apr;145(4):598-603.
- Grewal DS, et al. Comparing rates of retinal nerve fibre layer loss with GDxECC using different methods of visual-field progression. Br J Ophthalmol 2011 Aug;95(8):1122-7.
- Grewal DS, et al. Detecting glaucomatous progression using GDx with variable and enhanced corneal compensation using Guided Progression Analysis. Br J Ophthalmol 2011 Apr;94(4):502-8.
- Hantzschel J, et al. Comparison of normal- and high-tension glaucoma: nerve fiber layer and optic nerve head damage. Ophthalmologica 2014;231(3):160-5.
- *Harasymowycz PJ, et al. Validity of screening for glaucomatous optic nerve damage using confocal scanning laser ophthalmoscopy (Heidelberg Retina Tomograph II) in high-risk populations: a pilot study. Ophthalmol 2005 Dec;112(12):2164-71.
- Hata M, et al. measurement of retinal nerve fiber layer thickness in eyes with optic disc swelling using scanning laser polarimetry and optical coherence tomography. Clin Ophthalmol 2014;8:105-11.
- Healey PR, et al. Diagnostic accuracy of the Heidelberg Retina Tomograph for glaucoma. Ophthalmology 2010 Sep;117(9):1667-73.
- *Henderson PA, et al. Relationship between central corneal thickness and retinal nerve fiber thickness in ocular hypertensive patients. Ophthalmol 2005 Feb;112(2):251-6.
- Hlozanek M, et al. The retinal nerve fibre layer thickness in glaucomatous hydrophthalmic eyes assessed by scanning laser polarimetry with variable corneal compensation in comparison with age-matched healthy children. Acta Ophthalmol 2011 Mar 18 [Epub ahead of print].
- *Horn FK, et al. Association between localized visual field losses and thickness deviation of the nerve fiber layer in glaucoma. J Glaucoma 2005 Dec;14(6):419-25.
- Horn FK, et al. Correlation between local glaucomatous visual field defects and loss of nerve fiber layer thickness measured with polarimetry and spectral domain OCT. Invest Ophthalmol Vis Sci 2009 May;50(5):1971-7.
- Khawaja AP, et al. Corneal biomechanical properties and glaucoma-related quantitative traits in EPIC-Norfolk Eye Study. Invest Ophthalmol Vis Sci 2014 Jan 7;55(1):117-24.
- Kim HG, et al. Comparison of scanning laser polarimetry and optical coherence tomography in preperimetric glaucoma. Optom Vis Sci 2011 Jan;88(1):124-9.
- Kotowski J, et al. Imaging of the optic nerve and retinal nerve fiber layer: an essential part of glaucoma diagnosis and monitoring. Surv Ophthalmol 2014 Jul-Aug;59(4):458-67.
- *Lauande-Pimentel R, et al. Discrimination between normal and glaucomatous eyes with visual field and scanning laser polarimetry measurements. Br J Ophthalmol 2001 May;85(5):586-91.
- *Lin SC, et al. Optic nerve head and retinal nerve fiber layer analysis: a report by the American Academy of Ophthalmology. Ophthalmol 2007 Oct;114(10):1937-49.
- Makabe K, et al. Longitudinal relationship between retinal nerve fiber layer thickness parameters assessed by scanning laser polarimetry (HDxVCC) and visual field in glaucoma. Graefes Arch Clin Exp Ophthalmol 2012 Apr;250(4):575-81.
- *Manivannan A, et al. Clinical investigation of a true color scanning laser ophthalmoscope. Arch Ophthalmol 2001 Jun;119(6):819-24.
- Mansouri K, et al. Assessment of rates of structural change in glaucoma using imaging technologies. Eye 2011 Mar;25(3):269-77.

Medical Policy: OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)

Policy Number: 9.01.06

Page: 6 of 7

*Medeiros FA, et al. Comparison of retinal nerve fiber layer and optic disc imaging for diagnosing glaucoma in patients suspected of having the disease. Ophthalmology 2008 Aug;115(8):1340-6.

*Medeiros FA, et al. Use of progressive glaucomatous optic disk change as the reference standard for evaluation of diagnostic tests in glaucoma. Am J Ophthalmol 2005 Jun;139(6):1010-8.

Moghimi S, et al. Measurement of optic disc size and rim area with spectral-domain OCT and scanning laser ophthalmoscopy. Invest Ophthalmol Vis Sci 2012 Jul 9;53(8):4519-30.

Mohammadi SF, et al. An algorithm for glaucoma screening in clinical settings and its preliminary performance profile. J Ophthalmic Vis Res 2013 Oct;8(4):314-20.

Moon BG, et al. Glaucoma progression detection by retinal nerve fiber layer measurement using scanning laser polarimetry: event and trend analysis. K J Ophthalmol 2012 Jun;26(3):174-81.

Mwanza JC, et al. Combining spectral domain optical coherence tomography structural parameters for the diagnosis of glaucoma with early visual field loss. Invest Ophthalmol Vis Sci 2013 Dec 20;54(13):8393-400.

*Leung CK, et al. American Chinese glaucoma imaging study: a comparison of the optic disc and retinal nerve fiber layer in detecting glaucomatous damage. Invest Ophthalmol Vis Sci 2007 Jun;48(6):2644-52.

Leung CK, et al. Retina nerve fiber layer imaging with spectral-domain optical coherence tomography a study on diagnostic agreement with Heidelberg Retinal Tomograph. Ophthalmology 2010 Feb;117(2):267-74.

*Mojon DS. Low specificity of scanning laser polarimetry. Ophthalmologica 2003 Jan-Feb;217(1):17-9.

*Ozdek SC, et al. Nerve fiber assessment with scanning laser polarimetry in glaucoma patients and glaucoma suspects. Eur J Ophthalmol 2001 Apr-Jun;11(2):139-44.

Pablo LE, et al. Retinal nerve fibre layer evaluation in ocular hypertensive eyes using optical coherence tomography and scanning laser polarimetry in the diagnosis of early glaucomatous defects. Br J Ophthalmol 2011 Jan;95(1):51-5.

Reus NJ, et al. Clinical assessment of stereoscopic optic disc photographs for glaucoma: the European Optic Disc Assessment Trial. Ophthalmology 2010 Apr;117(4):717-23.

Schulze A, et al. Comparison of laser scanning diagnostic devices for early glaucoma detection. J Glaucoma 2014 May 19 [Epub ahead of print].

*Sehi M, et al. Scanning laser polarimetry with variable and enhanced corneal compensation in normal and glaucomatous eyes. Am J Ophthalmol 2007 Feb;143(2):272-9.

Sehi M, et al. Evaluation of baseline structural factors for predicting glaucomatous visual-field progression using optical coherence tomography, scanning laser polarimetry and confocal scanning laser ophthalmoscopy. Eye 2012 Dec;26(12):1527-35.

*Sharma P, et al. Diagnostic tools for glaucoma detection and management. Surv Ophthalmol 2008 Nov;53(Suppl 1):S17-32.

Siepmann TA, et al. Retinal nerve fiber layer thickness in subgroups of multiple sclerosis, measured by optical coherence tomography and scanning laser polarimetry. J Neurol 2010 Oct;257(10):1654-60.

Spaeth GL, et al. Imaging of the optic disk in caring for patients with glaucoma: ophthalmology and photography remain the gold standard. Surv Ophthalmol 2014 Jul-Aug;59(4):454-8.

Strouthidis NG, et al. The Heidelberg retina tomography Glaucoma Probability Score: reproducibility and measurement of progression. Ophthalmology 2010 Apr;117(4):724-9.

Takis A, et al. Comparison of the nerve fiber layer of type 2 diabetic patients without glaucoma with normal subjects of the same age and sex. Clin Ophthalmol 2014 Feb 25;8:455-63.

Medical Policy: OPHTHALMOLOGIC TECHNIQUES FOR THE DIAGNOSIS OF GLAUCOMA (SCANNING LASER POLARIMETRY & OPHTHALMOSCOPY)

Policy Number: 9.01.06

Page: 7 of 7

*Tannenbaum DP, et al. Relationship between visual field testing and scanning laser polarimetry in patients with a large cup-to-disc ratio. Am J Ophthalmol 2001 Oct;132(4):501-6.

*Toth M, et al. Accuracy of combined GDx-VCC and matrix FDT in a glaucoma screening trial. J Glaucoma 2007 Aug;16(5):462-70.

*Toth M, et al. Accuracy of scanning laser polarimetry, scanning laser tomography, and their combination in a glaucoma screening trial. J Glaucoma 2008 Dec;17(8):639-46.

Townsend KA, et al. Imaging of the retinal nerve fibre layer for glaucoma. Br J Ophthalmol 2009 Feb;93(2):139-43.

Wang X, et al. Comparative study of retinal nerve fibre layer measurement by RTVue OCT and GDx VCC. Br J Ophthalmol 2011 Apr;95(4):509-13.

Weinreb RN, et al. Predicting the onset of glaucoma: the confocal scanning laser ophthalmoscopy ancillary study to the Ocular Hypertension Treatment Study. Ophthalmology 2010 Sep;117(9):1674-783.

Windisch BK, et al. Comparison between confocal scanning laser tomography, scanning laser polarimetry and optical coherence tomography on the ability to detect localized retinal nerve fibre defects in glaucoma patients. Br J Ophthalmol 2009 Feb;93(2):225-30.

Xu G, et al. retinal nerve fiber layer progression in glaucoma: a comparison between retinal nerve fiber layer thickness and retardance. Ophthalmology 2013 Dec;120(12):2493-500.

Yusuf IH, et al. Inability to perform posterior segment monitoring by scanning laser ophthalmoscopy or optical coherence tomography with some occlusive intraocular lenses in clinical use. J Cataract Refract Surg 2012 Mar;38(3):513-8.

*Zangwill LM, et al. Discriminating between normal and glaucomatous eyes using the Heidelberg retina tomograph, GDx nerve fiber analyzer, and optical clearance tomograph. Arch Ophthalmol 2001 Jul;119(7):985-93.

*Key Article

KEY WORDS

Nerve fiber analyser, GDx imaging, HRT, Optomap.

CMS COVERAGE FOR MEDICARE PRODUCT MEMBERS

Based on our review, Ophthalmologic Techniques for the Diagnosis of Glaucoma are not addressed in National or Local Medicare coverage determinations or policies.