

Evidence Based Guideline

Glaucoma, Evaluation by Ophthalmologic Techniques

File Name: glaucoma_evaluation_by_ophthalmologic_techniques
Origination: 3/2001
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Next CAP Review: 6/2012
Last Review: 6/2011

Description of Procedure or Service

Glaucoma is a disease characterized by degeneration of the optic nerve (optic disc). Elevated intraocular pressure has long been thought to be the primary etiology, but the relationship between intraocular pressure and optic nerve damage varies among patients, suggesting a multifactorial origin. For example, some patients with clearly elevated intraocular pressure will show no optic nerve damage, while other patients with marginal or no pressure elevation will, nonetheless, show optic nerve damage. The association between glaucoma and other vascular disorders such as diabetes or hypertension suggests vascular factors may play a role in glaucoma. Specifically, it has been hypothesized that reductions in blood flow to the optic nerve may contribute to the visual field defects associated with glaucoma.

Conventional management of the patient with glaucoma principally involves drug therapy to control elevated intraocular pressures and serial evaluation of the optic nerve. Standard methods of evaluation include careful direct examination of the optic nerve using ophthalmoscopy or stereophotography, or evaluation of visual fields.

There has been interest in developing more objective, reproducible techniques both to document optic nerve damage and to detect early changes in the optic nerve and retinal nerve fiber layer (RNFL) before the development of permanent visual field deficits. Specifically, evaluating changes in the thickness of the retinal nerve fiber layer have been investigated as a technique to diagnose and monitor glaucoma. In addition, there has been interest in measuring ocular blood flow as a diagnostic and management tool for glaucoma. A variety of new techniques have been developed, as described here:

Techniques to Evaluate the Optic Nerve/Retinal Nerve Fiber Layer (RNFL)

(Note: This policy only addresses uses of these techniques related to glaucoma.)

Confocal Scanning Laser Ophthalmoscopy

Confocal scanning laser ophthalmoscopy (CSLO) is a laser-based image acquisition technique, which is intended to improve the quality of the examination compared to standard ophthalmologic examination. A laser is scanned across the retina along with a detector system. Only a single spot on the retina is illuminated at any time, resulting in a high-contrast image of great reproducibility that can be used to estimate the thickness of the RNFL. In addition, this technique does not require maximal mydriasis, which may be a problem in patients with glaucoma. The Heidelberg Retinal Tomograph is probably the most common example of this technology.

Scanning Laser Polarimetry

The RNFL is birefringent, causing a change in the state of polarization of a laser beam as it passes. A 780-nm diode laser is used to illuminate the optic nerve. The polarization state of the light emerging from the eye is then evaluated and correlated with RNFL thickness. Unlike CSLO, scanning laser polarimetry (SLP) can directly measure the thickness of the RNFL. GDx® is a

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common example of a scanning laser polarimeter. GDx® contains a normative database and statistical software package to allow comparison to age-matched normal subjects of the same ethnic origin. The advantages of this system are that images can be obtained without pupil dilation, and evaluation can be done in approximately 10 minutes. Current instruments have added enhanced and variable corneal compensation technology to account for corneal polarization.

Optical Coherence Tomography

Optical coherence tomography (OCT) uses near-infrared light to provide direct cross-sectional measurement of the RNFL. The principles employed are similar to those used in B-mode ultrasound except light, not sound, is used to produce the 2-dimensional images. The light source can be directed into the eye through a conventional slit-lamp biomicroscope and focused onto the retina through a typical 78-diopter lens. This system requires dilation of the patient's pupil. OCT® is an example of this technology.

Pulsatile Ocular Blood Flow

The pulsatile variation in ocular pressure results from the flow of blood into the eye during cardiac systole. Pulsatile ocular blood flow can thus be detected by the continuous monitoring of intraocular pressure. The detected pressure pulse can then be converted into a volume measurement using the known relationship between ocular pressure and ocular volume. Pulsatile blood flow is primarily determined by the choroidal vessels, particularly relevant to patients with glaucoma, since the optic nerve is supplied in large part by choroidal circulation.

Doppler Ultrasonography

Color Doppler imaging has also been investigated as a technique to measure the blood velocity in the retinal and choroidal arteries.

Related Policies:

Anterior Eye Segment Optical Imaging

*****Note: This Evidence Based Guideline is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.**

Evidence Based Guideline for Ophthalmologic Techniques to Evaluate Glaucoma

Analysis of the optic nerve (retinal nerve fiber layer) using scanning laser ophthalmoscopy, scanning laser polarimetry, and optical coherence tomography may be appropriate when performed for the diagnosis and evaluation of patients with glaucoma or glaucoma suspects.

Factors defining individuals at high risk for developing glaucoma include **any** of the following:

- African Americans over 40 years old.
- Caucasians over 65 years old.
- Family history of glaucoma.
- Diabetes.

Patients who are defined as a glaucoma suspect should have **at least one** of the following documented in their medical record:

- IOP \geq 22 mm of mercury; **OR**
- Cup to disc ratio of \geq 0.4 with a family history of glaucoma or risk of low tension glaucoma; **OR**
- Documented increase of cup to disc ratio \geq 0.2; **OR**
- Cup to disc ratio \geq 5; **OR**

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- Focal notch with rim/disc ≥ 0.2 ; **OR**
- Disc hemorrhage; **OR**
- Optic disc abnormality; **OR**
- Visual field defect.

Medical Evidence regarding Ophthalmologic Techniques to Evaluate Glaucoma indicates it is not recommended in the following situations

The measurement of ocular blood flow, pulsatile ocular blood flow or blood flow velocity with Doppler ultrasonography is not recommended for the diagnosis and follow up of patients with glaucoma.

A literature review did not identify any studies that demonstrate the clinical utility for use of pulsatile ocular blood flow or blood flow velocity in patients with glaucoma. These techniques are used in evaluating various glaucoma treatments. A recent publication reported on color Doppler imaging (CDI) in normal and glaucomatous eyes. Using data from reported studies, a weighted mean was derived for the peak systolic velocity, end diastolic velocity and Pourcelot's resistive index in the ophthalmic, central retinal and posterior ciliary arteries. Data from 3,061 glaucoma patients and 1,072 controls were included. The mean values for glaucomatous eyes were within 1 SD of the values for controls for most CDI parameters. Methodologic differences created inter-study variance in CDI values, complicating the construction of a normative database and limiting its utility. The authors noted that because the mean values for glaucomatous and normal eyes have overlapping ranges, caution should be used when classifying glaucoma status based on a single CDI measurement.

Measurement of ocular blood flow has also been studied as a technique for evaluating patients with glaucoma. While reports of use have been longstanding, the clinical impact of this technique is not known. Reports have commented on the complexity of these parameters and have noted that these technologies are not commonly used in clinical settings. The impact on health outcomes is not known.

Benefits Application

This evidence based guideline relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this guideline.

Billing/Coding/Physician Documentation Information

This guideline may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable codes: 92133, 92134, 0198T

Codes 92133 and 92134 cannot be reported for the same patient encounter. The use in glaucoma testing will now be reported with 92133. The most common use of 92134 will be for assessments of the efficacy of intraocular injection treatment of macular degeneration.

92134 could be used to describe both scanning laser ophthalmoscopy and scanning laser polarimetry. There is no specific code describing optical coherence tomography.

93875 could be used to describe Doppler ultrasonography of the choroidal arteries.

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Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual, 7/16/1999; 9.03.06
BCBSA Medical Policy Reference Manual, 11/20/01; 9.03.06
Specialty Matched Consultant Advisory Panel - 3/2003
BCBSA Medical Policy Reference Manual, 7/17/03; 9.03.06
Specialty Matched Consultant review - 2/19/2004
BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.06, 7/15/04.
Specialty Matched Consultant Advisory Panel - 1/2005
BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.06, 12/14/05
Specialty Matched Consultant Advisory Panel review - 1/25/07
BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.06, 12/12/06.
BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.06, 1/10/08.
Specialty Matched Consultant Advisory Panel review - 4/6/09.
BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.06, 1/13/11.
Medical Director – 4/2011
Specialty Matched Consultant Advisory Panel Review- 6/2011

Policy Implementation/Update Information

3/01	Original policy issued.
3/02	Policy revised to include analysis of the retinal nerve fiber layer and optical coherence tomography as additional investigational indications. Policy statement revised for clarity.
4/22/04	Specialty Matched Consultant Advisory Panel review 3/24/2003. "Description of Procedure" section revised to clarify techniques to evaluate the retinal nerve fiber layer. Benefits Application and Billing/Coding sections revised. Specialty Matched Consultant review 2/19/04. "Policy," "When covered" and "When not covered" sections revised based on specialty matched consultant review. Policy name changed from "Glaucoma, Evaluation by <u>Ophthalmic</u> Techniques" to Glaucoma, Evaluation by <u>Ophthalmologic</u> Techniques". Notification given 4/22/04. Effective date 7/1/04.
1/20/05	Specialty Matched Consultant Advisory Panel review 1/5/05. No changes to criteria.
8/21/06	Medical Policy changed to Evidence Based Guideline. (pmo)
2/26/07	Specialty Matched Consultant Advisory Panel review. No changes to guidelines. Reference sources added. (pmo)
4/27/09	No changes to guidelines. Reference sources added. (pmo)
6/22/10	Policy Guideline Number(s) removed (amw)
2/15/11	Added new 2011 CPT codes 92133 and 92134 to Billing/Coding section. (lpr)
4/26/11	"Description" section revised and updated. The "Evidence Based Guideline" section revised, removed the following statements; "Techniques to evaluate the retinal nerve fiber layer (scanning laser ophthalmoscopy, scanning laser polarimetry and optical coherence

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tomography) will be referred to as scanning laser glaucoma tests (SLGT). SLGT may be appropriate when performed for the evaluation of individuals at high risk for developing glaucoma and for the monitoring of patients with a diagnosis of glaucoma.” Added the following statement; “Analysis of the optic nerve (retinal nerve fiber layer) using scanning laser ophthalmoscopy, scanning laser polarimetry, and optical coherence tomography may be appropriate when performed for the diagnosis and evaluation of patients with glaucoma or glaucoma suspects.” Revised the wording in the “When Not Recommended” section from; “When the above medical criteria are not met. The use of SLGT to screen for glaucoma. The use of optic nerve head analyzers (i.e. Glaucoma Scope), the measurement of pulsatile ocular blood flow or blood flow velocity with Doppler ultrasonography are not recommended for the diagnosis and follow up of patients with glaucoma.” to “The measurement of ocular blood flow, pulsatile ocular blood flow or blood flow velocity with Doppler ultrasonography is not recommended for the diagnosis and follow up of patients with glaucoma.” “A literature review did not identify any studies that demonstrate the clinical utility for use of pulsatile ocular blood flow or blood flow velocity in patients with glaucoma. These techniques are used in evaluating various glaucoma treatments. A recent publication reported on color Doppler imaging (CDI) in normal and glaucomatous eyes. Using data from reported studies, a weighted mean was derived for the peak systolic velocity, end diastolic velocity and Pourcelot's resistive index in the ophthalmic, central retinal and posterior ciliary arteries. Data from 3,061 glaucoma patients and 1,072 controls were included. The mean values for glaucomatous eyes were within 1 SD of the values for controls for most CDI parameters. Methodologic differences created inter-study variance in CDI values, complicating the construction of a normative database and limiting its utility. The authors noted that because the mean values for glaucomatous and normal eyes have overlapping ranges, caution should be used when classifying glaucoma status based on a single CDI measurement. Measurement of ocular blood flow has also been studied as a technique for evaluating patients with glaucoma. While reports of use have been longstanding, the clinical impact of this technique is not known. Reports have commented on the complexity of these parameters and have noted that these technologies are not commonly used in clinical settings. The impact on health outcomes is not known.” Added 0198T to “Billing/Coding” section and removed deleted CPT code, 92135. References added. (btw)

7/19/11 Specialty Matched Advisory Consultant Panel Review 6/29/11. No changes to criteria. (lpr)

11/22/11 Deleted CPT codes 92120, 93875 from Billing/Coding section. (lpr)

Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.