MEDICAL POLICY

POLICY TITLE	OPHTHALMOLOGIC TECHNIQUES THAT EVALUATE THE POSTERIOR EYE SEGMENT
POLICY NUMBER	MP 2.056

CLINICAL BENEFIT	☐ MINIMIZE SAFETY RISK OR CONCERN. ☒ MINIMIZE HARMFUL OR INEFFECTIVE INTERVENTIONS. ☐ ASSURE APPROPRIATE LEVEL OF CARE. ☐ ASSURE APPROPRIATE DURATION OF SERVICE FOR INTERVENTIONS. ☐ ASSURE THAT RECOMMENDED MEDICAL PREREQUISITES HAVE BEEN MET. ☐ ASSURE APPROPRIATE SITE OF TREATMENT OR SERVICE.
Effective Date:	**1/1/2025**

I. POLICY

Analysis of the optic nerve (retinal nerve fiber layer) may be considered medically necessary when using scanning laser ophthalmoscopy, scanning laser polarimetry, and optical coherence tomography in the diagnosis and evaluation of patients with any of the following:

- Glaucoma or glaucoma suspects
- Multiple sclerosis,
- Increased intracranial pressure,
- Optic neuritis or optic nerve disorders

Analysis of the optic nerve (retinal nerve fiber layer) for all other indications is considered **investigational**. There is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

The use of a patient-initiated home optical coherence tomography device is considered **investigational** for all indications. There is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

The measurement of ocular blood flow, pulsatile ocular blood flow, or blood flow velocity is considered **investigational** for all indications. There is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Cross-references:

MP 2.028 Eye Care
MP 2.085 Optical Coherence Tomography (OCT) of the Anterior Eye Segment
MP 2.086 Retinal Telescreening for Diabetic Retinopathy

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II. PRODUCT VARIATIONS

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This policy is only applicable to certain programs and products administered by Capital Blue Cross and subject to benefit variations as discussed in Section VI. Please see additional information below.

FEP PPO- Refer to FEP Medical Policy Manual. The FEP Medical Policy Manual can be found at: https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies.

III. DESCRIPTION/BACKGROUND

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Several techniques have been developed to measure the thickness of the optic nerve/retinal nerve fiber layer (RNFL) as a method to diagnose and monitor glaucoma and other retinal diseases. Measurement of ocular blood flow is also being evaluated as a diagnostic and management tool for glaucoma.

GLAUCOMA

Glaucoma is characterized by degeneration of the optic nerve (optic disc). Elevated intraocular pressure (IOP) has long been thought to be the primary etiology, but the relation between IOP and optic nerve damage varies among patients, suggesting a multifactorial origin. For example, some patients with clearly elevated IOP will show no optic nerve damage, while others with marginal or no pressure elevation will show optic nerve damage. The association between glaucoma and other vascular disorders (e.g., diabetes, 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.

Diagnosis and Management of Glaucoma

A comprehensive ophthalmologic exam is required for the diagnosis of glaucoma, but no single test is adequate to establish diagnosis. A comprehensive ophthalmologic examination includes assessment of the optic nerve, evaluation of visual fields, and measurement of ocular pressure. The presence of characteristic changes in the optic nerve or abnormalities in visual field, together with increased IOP, is sufficient for a definitive diagnosis. However, some patients will show ophthalmologic evidence of glaucoma with normal IOPs. These cases of normal tension glaucoma (NTG) are considered to be a type of primary open-angle glaucoma (POAG). Angle-closure glaucoma is another type of glaucoma associated with an increase in IOP. The increased IOP in angle-closure glaucoma arises from a reduction in aqueous outflow from the eye due to a closed angle in the anterior chamber. Diagnosis of angle-closure glaucoma is detailed in **MP 2.085**.

Conventional management of patients with glaucoma principally involves drug therapy to control elevated IOPs, and serial evaluation of the optic nerve, to follow disease progression. Standard methods of evaluation include careful direct examination of the optic nerve using ophthalmoscopy or stereophotography, or evaluation of visual fields. There is 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 RNFL

thickness has been investigated as a technique to diagnose and monitor glaucoma. However, IOP reduction is not effective in decreasing disease progression in a significant number of patients, and in patients with NTG, there is never an increase in IOP. It has been proposed that vascular dysregulation is a significant cause of damage to the RNFL, and there is interest in measuring ocular blood flow as both a diagnostic and a management tool for glaucoma. Changes in blood flow to the retina and choroid may be particularly relevant for diagnosis and treatment of NTG. A variety of techniques have been developed, as described below. (Note: This policy only addresses techniques related to the evaluation of the optic nerve, RNFL, or blood flow to the retina and choroid in patients with glaucoma.)

MULTIPLE SCLEROSIS

This central nervous system disease involves an immune-mediated process, which directs an abnormal response from the body's immune system to the central nervous system (the brain, spinal cord, and optic nerves). In up to 20% of multiple sclerosis (MS) patient's optic neuropathy may be the first demyelinating event. The most common type of involvement of the visual pathways is optic neuritis, which can result in varying degrees of visual loss.

OPTIC NEURITIS

Inflammation of the optic nerve. Often associated with MS this demyelinating and inflammatory condition occurs in 50% of MS patients and is the presenting feature in 15 to 20 percent of patients. Typically, painful, monocular vision loss evolves over hours to a few days. OCT can detect RNFL thinning in 85% of patients with this condition.

PAPILLEDEMA

Papilledema is optic disc swelling due to raised intracranial pressure. It occurs when raised intracranial pressure is transmitted to the optic nerve sheath. Typically bilateral, it is often discovered when individuals are evaluated for other symptoms. Visual symptoms are common, although rarely the presenting symptom. Diagnostic testing may include optical coherence tomography both to monitor swelling and to determine changes surrounding the retina. Left untreated vision loss can occur.

Techniques to Evaluate the Optic Nerve and RNFL

Confocal Scanning Laser Ophthalmoscopy

Confocal scanning laser ophthalmoscopy (CSLO) is an image acquisition technique intended to improve the quality of the eye examination compared with 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 RNFL thickness. In addition, this technique does not require maximal mydriasis, which may be problematic in patients with glaucoma. The Heidelberg Retinal Tomograph is probably the most common example of this technology.

Scanning Laser Polarimetry

The RNFL is birefringent (or biorefractive), meaning that it causes 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 common SLP device. GDx contains a normative database and statistical software package that compare scan results with 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 completed in 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 analysis software is being developed to include optic nerve head parameters with spectral domain OCT, analysis of macular parameters, and hemodynamic parameters with Doppler OCT and OCT angiography.

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 relation between ocular pressure and ocular volume. Pulsatile blood flow is primarily determined by the choroidal vessels, particularly relevant to patients with glaucoma, because the optic nerve is supplied in large part by choroidal circulation.

Techniques to Measure Ocular Blood Flow

A number of techniques have been developed to assess ocular blood flow. They include laser speckle flowgraphy, color Doppler imaging, Doppler Fourier domain OCT, laser Doppler velocimetry, confocal scanning laser Doppler flowmetry, and retinal functional imaging.

Laser Speckle Flowgraphy

Laser speckle is detected when a coherent light source such as laser light is dispersed from a diffusing surface such as retinal and choroidal vessels and the circulation of the optic nerve head. The varying patterns of light can be used to determine red blood cell velocity and retinal blood flow. However, due to differences in the tissue structure in different eyes, flux values cannot be used for comparisons between eyes. This limitation may be overcome by subtracting background choroidal blood flow results from the overall blood flow results in the region of interest.

Color Doppler Imaging

Color Doppler imaging has also been investigated as a technique to measure the blood flow velocity in the retinal and choroidal arteries. This technique delivers ultrasound in pulsed Doppler mode with a transducer set on closed eyelids. The examination takes 30 to 40 minutes and is most effective for the mean velocity of large ophthalmic vessels such as the ophthalmic artery, the central retinal artery, and the short posterior ciliary arteries. However, total blood flow cannot be determined with this technique, and imaging is highly dependent on probe placement.

Doppler Fourier Domain OCT
Doppler Fourier domain OCT is a noncontact imaging technique that detects the intensity of the light scattered back from erythrocytes as they move in the vessels of the ocular tissue. This induces a frequency shift that represents the velocity of the blood in the ocular tissue.

Laser Doppler Velocimetry
Laser Doppler velocimetry compares the frequency of reflected laser light from a moving particle to stationary tissue.

Confocal Scanning Laser Doppler Flowmetry
Confocal scanning laser Doppler flowmetry combines laser Doppler flowmetry with confocal scanning laser tomography. Infrared laser light is used to scan the retina, and the frequency and amplitude of Doppler shifts are determined from the reflected light. Determinations of blood velocity and blood volume are used to compute the total blood flow and create a physical map of retinal flow values.

Regulatory Status
A number of confocal scanning laser ophthalmoscopy, scanning laser polarimetry, and optical coherence tomography (OCT) devices have been cleared by the U.S. Food and Drug Administration (FDA) through the 510(k) process for imaging the posterior eye segment. For example, the RTVue XR OCT Avanti™ (Optovue) is an OCT system indicated for the in vivo imaging and measurement of the retina, retinal nerve fiber layer, and optic disc as a tool and aid in the clinical diagnosis and management of retinal diseases. The RTVue XR OCT Avanti™ with Normative Database is a quantitative tool for comparing retina, retinal nerve fiber layer, and optic disk measurements in the human eye to a database of known normal subjects. It is intended as a diagnostic device to aid in the detection and management of ocular diseases. In 2016, the RTVue XR OCT with Avanti™ with AngioVue™ Software was cleared by FDA through the 510(k) process (K153080) as an aid in the visualization of vascular structures of the retina and choroid. FDA product code: HLI, OBO.

In 2012, the iExaminer™ (Welch Allyn) was cleared for marketing by FDA through the 510(k) process. The iExaminer™ consists of a hardware adapter and associated software (iPhone® App) to capture, store, send, and retrieve images from the PanOptic™ Ophthalmoscope (Welch Allyn) using an iPhone®. FDA product code: HKI.

IV. RATIONALE

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SUMMARY OF EVIDENCE
For individuals who have glaucoma or suspected glaucoma who receive imaging of the optic nerve and retinal nerve fiber layer, the evidence includes studies on diagnostic accuracy. Relevant outcomes are test accuracy, symptoms, morbid events, functional outcomes, and medication use. Confocal scanning laser ophthalmoscopy (CSLO), scanning laser polarimetry (SLP), OCT can be used to evaluate the optic nerve and retinal nerve fiber layer in patients with glaucoma and suspected glaucoma. Numerous articles have described findings from patients with known and suspected glaucoma using CSLO, SLP, and OCT. These studies have reported that abnormalities may be detected on these examinations before functional changes are noted.

The literature and specialty society guidelines have indicated that optic nerve analysis using CSLO, SLP, and OCT are established add-on tests that may be used to diagnose and manage patients with glaucoma and suspected glaucoma. These results are often considered along with other findings to make diagnostic and therapeutic decisions about glaucoma care, including use of topical medication, monitoring, and surgery to lower intraocular pressure. Thus, accurate diagnosis of glaucoma would be expected to reduce the progression of glaucoma. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have glaucoma or suspected glaucoma who receive evaluation of ocular blood flow, the evidence includes association studies. Relevant outcomes are test accuracy, symptoms, morbid events, functional outcomes, and medication use. Techniques to measure ocular blood flow or ocular blood velocity are used to determine appropriate glaucoma treatment options. The data for these techniques remain limited. Literature reviews have not identified studies addressing whether these technologies improve diagnostic accuracy or whether they improve health outcomes in patients with glaucoma. Some have suggested that these parameters may inform understanding of the variability in visual field changes in patients with glaucoma (i.e., they may help explain why patients with similar levels of intraocular pressure develop markedly different visual impairments). However, data on use of ocular blood flow, pulsatile ocular blood flow, and/or blood flow velocity are currently lacking. The evidence is insufficient to determine the effects of the technology on health outcomes.

V. DEFINITIONS

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CUP/DISC RATIO in ophthalmology is the mathematic relationship between the horizontal or vertical diameter of the physiologic cup and the diameter of the optic disc.

DIABETIC RETINOPATHY is a disorder of retinal blood vessels characterized by capillary microaneurysms, hemorrhage, exudates, and the formation of new vessels and connective tissue.

INTRAOCULAR PRESSURE refers to the internal pressure of the eye regulated by resistance to the flow of aqueous humor through the fine sieve of the trabecular meshwork.

VI. BENEFIT VARIATIONS

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The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member’s health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits, and which require preauthorization. There are different benefit plan designs in each product administered by Capital Blue Cross. Members and providers should consult the member’s health benefit plan for information or contact Capital Blue Cross for benefit information.

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VII. DISCLAIMER

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Capital Blue Cross' medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital Blue Cross' Provider Services or Member Services. Capital Blue Cross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VIII. CODING INFORMATION

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Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Investigational and therefore not covered:

Procedure Codes								
0198T	0604T	0605T	0606T					

Covered when medically necessary:

Procedure Codes								
92133	92137							

ICD-10-CM Diagnosis Codes	Description					
G35	G93.2	H40.001	H40.002	H40.003	H40.009	H40.011
H40.012	H40.013	H40.019	H40.021	H40.022	H40.023	H40.029
H40.031	H40.032	H40.033	H40.039	H40.041	H40.042	H40.043
H40.049	H40.051	H40.052	H40.053	H40.059	H40.061	H40.062
H40.063	H40.069	H40.2210				
H40.10X0	H40.10X1	H40.10X2	H40.10X3	H40.10X4	H40.1110	H40.1111
H40.1112	H40.1113	H40.1114	H40.1120	H40.1121	H40.1122	H40.1123
H40.1124	H40.1130	H40.1131	H40.1132	H40.1133	H40.1134	H40.1190
H40.1191	H40.1192	H40.1193	H40.1194	H40.1210	H40.1211	H40.1212
H40.1213	H40.1214	H40.1220	H40.1221	H40.1222	H40.1223	H40.1224
H40.1230	H40.1231	H40.1232	H40.1233	H40.1234	H40.1290	H40.1291
H40.1292	H40.1293	H40.1294	H40.1310	H40.1311	H40.1312	H40.1313
H40.1314	H40.1320	H40.1321	H40.1322	H40.1323	H40.1324	H40.1330

H40.1331	H40.1332	H40.1333	H40.1334	H40.1390	H40.1391	H40.1392
H40.1393	H40.1394	H40.1410	H40.1411	H40.1412	H40.1413	H40.1414
H40.1420	H40.1421	H40.1422	H40.1423	H40.1424	H40.1430	H40.1431
H40.1432	H40.1433	H40.1434	H40.1490	H40.1491	H40.1492	H40.1493
H40.1494	H40.151	H40.152	H40.153	H40.159	H40.211	H40.212
H40.213	H40.219	H40.20X0	H40.20X1	H40.20X2	H40.20X3	H40.20X4
H40.2211	H40.2212	H40.2213	H40.2214	H40.2220	H40.2221	H40.2222
H40.2223	H40.2224	H40.2230	H40.2231	H40.2232	H40.2233	H40.2234
H40.2290	H40.2291	H40.2292	H40.2293	H40.2294	H40.231	H40.232
H40.233	H40.239	H40.241	H40.242	H40.243	H40.249	H40.31X0
H40.31X1	H40.31X2	H40.31X3	H40.31X4	H40.32X0	H40.32X1	H40.32X2
H40.32X3	H40.32X4	H40.33X0	H40.33X1	H40.33X2	H40.33X3	H40.33X4
H40.40X0	H40.40X1	H40.40X2	H40.40X3	H40.40X4	H40.41X0	H40.41X1
H40.41X2	H40.41X3	H40.41X4	H40.42X0	H40.42X1	H40.42X2	H40.42X3
H40.42X4	H40.43X0	H40.43X1	H40.43X2	H40.43X3	H40.43X4	H40.50X0
H40.50X1	H40.50X2	H40.50X3	H40.50X4	H40.51X0	H40.51X1	H40.51X2
H40.51X3	H40.51X4	H40.52X0	H40.52X1	H40.52X2	H40.52X3	H40.52X4
H40.53X0	H40.53X1	H40.53X2	H40.53X3	H40.53X4	H40.60X0	H40.60X1
H40.60X2	H40.60X3	H40.60X4	H40.61X0	H40.61X1	H40.61X2	H40.61X3
H40.61X4	H40.62X0	H40.62X1	H40.62X2	H40.62X3	H40.62X4	H40.63X0
H40.63X1	H40.63X2	H40.63X3	H40.63X4	H40.811	H40.812	H40.813
H40.819	H40.821	H40.822	H40.823	H40.829	H40.831	H40.832
H40.833	H40.839	H40.89	H42	H46.00	H46.01	H46.02
H46.03	H46.10	H46.11	H46.12	H46.13	H46.2	H46.3
H46.8	H46.9	H47.011	H47.012	H47.013	H47.019	H47.021
H47.022	H47.023	H47.029	H47.031	H47.032	H47.033	H47.039
H47.091	H47.092	H47.093	H47.099	H47.10	H47.11	H47.12
H47.13	H47.141	H47.142	H47.143	H47.149	H47.20	H47.211
H47.212	H47.213	H47.219	H47.22	H47.231	H47.232	H47.233
H47.239	H47.291	H47.292	H47.293	H47.299	H47.311	H47.312
H47.313	H47.319	H47.321	H47.322	H47.323	H47.329	H47.331
H47.332	H47.333	H47.339	H47.391	H47.392	H47.393	H47.399
H47.41	H47.42	H47.43	H47.49	H47.511	H47.512	H47.519
H47.521	H47.522	H47.529	H47.531	H47.532	H47.539	H47.611
H47.612	H47.619	H47.621	H47.622	H47.629	H47.631	H47.632
H47.639	H47.641	H47.642	H47.649	H47.9	Q15.0	Z01.01

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X. POLICY HISTORY

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MP 2.056	**01/01/2020 Administrative Update**. New codes 92201 and 92202 added.
	04/21/2020 Consensus Review. Policy statement unchanged. Removed procedure codes 92201 and 92202, references updated.
	07/31/2020 Major Review. Added multiple sclerosis, increased intracranial pressure, optic neuritis, and optic nerve disorders to policy statement as potentially medically necessary. Coding updated, added ICD10 codes H46-H47, G35, and G93.2. References updated. “for Glaucoma” removed from policy title.
	09/16/2021 Minor Review. Added the use of a patient-initiated home optical coherence tomography device investigational. References and coding updated. Updated FEP language.
	04/07/2022 Consensus Review. No change to policy statement. References reviewed and updated. Coding table format updated.
	05/11/2023 Consensus Review. No change to policy statement. References reviewed and updated. No coding changes.
	05/22/2024 Consensus Review. No change to policy statement. References reviewed and updated. Added ICD-10 diagnosis code H40.2210. No procedure code changes.
	12/11/2024 Administrative Update. Added code 92137. Effective 1/1/2025.

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POLICY TITLE	OPHTHALMOLOGIC TECHNIQUES THAT EVALUATE THE POSTERIOR EYE SEGMENT
POLICY NUMBER	MP 2.056

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