Corporate Medical Policy

Optical Coherence Tomography (OCT) Anterior Segment of the Eye

File Name:	optical_coherence_tomography_(OCT)_anterior_segment_of_the_eye
Origination:	2/2010
Last CAP Review:	6/2018
Next CAP Review:	6/2019
Last Review:	6/2018

Description of Procedure or Service

Optical Coherence Tomography
Optical coherence tomography (OCT) is a noninvasive, high-resolution imaging method that can be used to visualize ocular structures. OCT creates an image of light reflected from the ocular structures. In this technique, a reflected light beam interacts with a reference light beam. The coherent (positive) interference between the 2 beams (reflected and reference) is measured by an interferometer, allowing construction of an image of the ocular structures. This method allows cross-sectional imaging at a resolution of 6 to 25 µm.

The Stratus OCT, which uses a 0.8-µm wavelength light source, was designed to evaluate the optic nerve head, retinal nerve fiber layer, and retinal thickness in the posterior segment. The Zeiss Visante OCT and AC Cornea OCT use a 1.3-µm wavelength light source designed specifically for imaging the anterior eye segment. Light of this wavelength penetrates the sclera, allowing high-resolution cross-sectional imaging of the anterior chamber (AC) angle and ciliary body. The light is, however, typically blocked by pigment, preventing exploration behind the iris. Ultrahigh resolution OCT can achieve a spatial resolution of 1.3 µm, allowing imaging and measurement of corneal layers.

Applications of OCT
OCT of the anterior eye segment is being evaluated as a noninvasive diagnostic and screening tool with a number of potential applications. One proposed use of anterior segment (AS) OCT is to determine whether there is a narrowing of the anterior chamber angle, which could lead to angle-closure glaucoma. Another general area of potential use is as a pre- and postsurgical evaluation tool for of anterior chamber procedures. This could include assessment of corneal thickness and opacity, calculation of intraocular lens power, guiding surgery, imaging intracorneal ring segments, and assessing complications following surgical procedures such as blockage of glaucoma tubes or detachment of Descemet membrane following endothelial keratoplasty (see evidence review 9.03.22). A third general category of use is to image pathologic processes such as dry eye syndrome, tumors, noninfectious uveitis, and infections. It is proposed that AS OCT provides better images than slit-lamp biomicroscopy/gonioscopy and ultrasound biomicroscopy (UBM) due to higher resolution; in addition, AS OCT does not require probe placement under topical anesthesia.

An early application of OCT technology was the evaluation of the cornea before and after refractive surgery. Because this noninvasive procedure can be conducted by a technician, it has been proposed that this device may provide a rapid diagnostic and screening tool for detecting angle-closure glaucoma. Glaucoma is characterized by degeneration of the optic nerve.

The classification of glaucoma as open angle or angle closure relies on assessment of the anterior segment anatomy, particularly that of the AC angle. Angle-closure glaucoma is characterized by obstruction of aqueous fluid drainage through the trabecular meshwork (the primary fluid egress site) from the eye's AC. The width of the angle is a factor affecting the drainage of aqueous humor. A wide

unobstructed iridocorneal angle allows sufficient drainage of aqueous humor, whereas a narrow angle may impede the drainage system and leave the patient susceptible to an increase in IOP and angle-closure glaucoma.

A comprehensive ophthalmologic examination for glaucoma includes assessment of the optic nerve and retinal nerve fiber layer, 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 intraocular pressure (IOP), is sufficient for a definitive diagnosis of glaucoma.

Alternative methods of evaluating the AC are slit-lamp biomicroscopy or UBM. Slit-lamp biomicroscopy is typically used to evaluate the AC; however, the chamber angle can only be examined with specialized lenses, the most common being the gonioscopic mirror. In this procedure, a gonio lens is applied to the surface of the cornea, which may result in distortion of the globe. Ultrasonography may also be used for imaging the anterior eye segment.1 Ultrasonography uses high-frequency mechanical pulses (10-20 MHz) to build a picture of the front of the eye. An ultrasound scan along the optical axis assesses corneal thickness, AC depth, lens thickness, and axial length. Ultrasound scanning across the eye creates a 2-dimensional image of the ocular structures. It has a resolution of 100 μm but only moderately high intraobserver and low interobserver reproducibility. UBM (50 MHz) has a resolution of 30 to 50 μm. As with slit-lamp biomicroscopy with a gonioscopic mirror, this technique requires placement of a probe under topical anesthesia.

Regulatory Status
Multiple optical coherence tomography (OCT) systems have been cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process. Examples of approved systems are the Visante™ OCT (Carl Zeiss Meditec); the RTVue® (Optovue) (FDA product code: HLI); and the Slit Lamp OCT (SL-OCT; Heidelberg Engineering) (FDA product code: MXK). The microscope-integrated OCT devices for intraoperative use include the ReScan 700 (Zeiss) and the iOCT® system (Haag-Streit). Portable devices for intraoperative use include the Bioptigen Envisu™ (Bioptigen) and the Optovue iVue® (Optovue). Ultrahigh resolution OCT devices include the SOCT Copernicus HR (Optopol Technologies).

Commercially available laser systems, such as the LenSx® (Alcon), Catalys® (OptiMedica), and VICTUS® (Technolas Perfect Vision), include OCT to provide image guidance for laser cataract surgery. FDA product code: OOE.

Custom-built devices, which do not require FDA approval, are also used.

The AC Cornea OCT (Ophthalmic Technologies, Toronto, ON) is not cleared for marketing in the United States.

Related Policies:
Corneal Topography/Computer-Assisted Corneal Topography/Photokeratoscopy
Ophthalmologic Techniques of Evaluating Glaucoma
Aqueous Shunts and Devices for Glaucoma
Endothelial Keratoplasty

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

Policy

Optical Coherence Tomography (e.g., OCT) anterior segment of the eye is considered **investigational**. BCBSNC does not cover investigational services.

Benefits Application

This medical policy 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 medical policy.

When Optical Coherence Tomography (OCT) Anterior Segment of the Eye is covered

Not applicable.

When Optical Coherence Tomography (OCT) Anterior Segment of the Eye is not covered

Optical Coherence Tomography (e.g., OCT) anterior segment of the eye is considered **investigational.** BCBSNC does not provide coverage for investigational services or procedures.

Policy Guidelines

Optical coherence tomography (OCT) is a noninvasive, high-resolution imaging method that can be used to visualize ocular structures. OCT of the anterior segment (AS) is being evaluated as a noninvasive diagnostic and screening tool for detecting angle-closure glaucoma , for presurgical evaluation, surgical guidance, and for assessing complications following surgical procedures. It is also being studied as a tool to evaluate the pathologic processes of dry eye syndrome, tumors, uveitis, and infections.

For individuals who are being evaluated for angle-closure glaucoma who receive AS OCT, the evidence includes case series and cohort studies. Relevant outcomes are test accuracy, symptoms, change in disease status, and morbid events. Current literature consists primarily of assessments of qualitative and quantitative imaging and detection capabilities. Ideally, a diagnostic test should be evaluated based on its technical performance, diagnostic accuracy (sensitivity, specificity, predictive value), and effect on health outcomes. Technically, OCT has the ability to create high-resolution images of the AS. Studies have shown that AS OCT detects more eyes with narrow or closed angles than gonioscopy, suggesting that the sensitivity of OCT is higher than that of gonioscopy. However, because of clinical follow-up and validation studies, it is not clear to what degree these additional cases are true positives or false positives and, therefore, the specificity and predictive values cannot be determined. The evaluation of diagnostic performance depends, therefore, on evidence that the additional eyes identified with narrow angle by AS OCT are at higher risk for primary angle-closure glaucoma. Results from 1 study with mid-term follow-up have shown that some patients identified with angle closure on AS OCT will develop angle closure on gonioscopy after several years, but that there may also be a large number of false-positive results.

Longer term studies are needed to determine whether eyes classified as closed angle by AS OCT are at higher risk of developing primary angle-closure glaucoma. It is also not known whether early detection of angle closure will improve health outcomes in individuals who do not have symptoms of angle closure. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who are being evaluated for anterior eye surgery or postsurgical complications who receive AS OCT, the evidence includes case series. Relevant outcomes are test accuracy, symptoms, change in disease status, and morbid events. Use of AS OCT has been reported for presurgical evaluation, surgical guidance, and monitoring for postsurgical complications. There is some evidence

that the high-resolution images provided by AS OCT are superior to results from slit-lamp examination or gonioscopy for some indications. However, current literature is very limited. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have anterior eye segment disease or pathology who receive AS OCT, the evidence includes case series. Relevant outcomes are test accuracy, symptoms, change in disease status, and morbid events. The evidence related to the use of AS OCT for anterior segment disease or pathology (eg, dry eye syndrome, tumors, uveitis, infections) is limited, and does not support improvements in imaging compared to alternative diagnostic techniques. The evidence is insufficient to determine the effects of the technology on health outcomes.

Billing/Coding/Physician Documentation Information

This policy 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: *92132, 92227, 92228*

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 12/10/09.

Senior Medical Director review - 1/14/2010

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 2/10/2011.

Specialty Matched Consultant Advisory Panel review -6/2011.

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 2/9/12

Specialty Matched Consultant Advisory Panel Review- 6/2012

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 2/14/13

Specialty Matched Consultant Advisory Panel review- 6/2013

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 2/13/14

Specialty Matched Consulant Advisory Panel review- 6/2014

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 2/12/15

Specialty Matched Consultant Advisory Panel review- 6/2015

Specialty Matched Consultant Advisory Panel review- 6/2016

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 8/11/16

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 3/9/17

Medical Director review 3/2017

Specialty Matched Consultant Advisory Panel review- 6/2017

BCBSA Medical Policy Reference Manual [Electronic Version]. 9.03.18, 3/8/18

Specialty Matched Consultant Advisory Panel review- 6/2018

Policy Implementation/Update Information

For Policy Named: Anterior Eye Segment Optical Imaging

3/2/2010 Notification of new policy. Scanning computerized ophthalmic (e.g., OCT) imaging of the anterior eye segment is considered investigational. Notification given 3/2/2010. Effective date 6/8/2010.

1/4/11 Added new CPT codes 92132, 92227, 92228. Removed deleted CPT code 0187T. (lpr)

7/19/11 Specialty Matched Consultant Advisory Panel review 6/29/2011. Policy statement unchanged. Reference added. (lpr)

For Policy Renamed: Optical Coherence Tomography (OCT) Anterior Segment of the Eye

7/10/12 Specialty Matched Consultant Advisory Panel review 6/20/2012. Policy title/name change from Anterior Eye Segment Optical Imaging to Optical Coherence Tomography (OCT) Anterior Segment of the Eye for consistency with BCBSA. Revised description section and policy guidelines section. No change to policy statement. Reference added. (lpr)

4/1/13 Reference added. No change to policy statement. (lpr)

7/16/13 Specialty matched consultant advisory panel review meeting 6/19/2013. No change to policy statement. Reference added. (lpr)

4/1/14 Reference updated. No change to policy statement. (lpr)

7/15/14 Specialty matched consultant advisory panel review meeting 6/24/2014. No change to policy statement.(lpr)

3/31/15 Updated Description and Policy Guidelines sections. Reference added. No change to policy statement. (lpr)

7/28/15 Specialty Matched Consultant Advisory Panel review 6/24/2015. No change to policy statement. (lpr)

7/26/16 Specialty Matched Consultant Advisory Panel review 6/29/2016. No change to policy statement. (lpr)

9/30/16 Reference added. Regulatory status updated. No change to policy statement. (lpr)

4/28/17 Updated Description and Policy Guidelines sections. Added CPT codes 0470T, 0471T to the Billing/Coding section for effective date 7/1/17. Reference added. Medical Director review 3/2017. No change to policy statement. (lpr)

7/28/17 Deleted CPT codes 0470T, 0471T from Billing/Coding section. Specialty Matched Consultant Advisory Panel review 6/28/2017. No change to policy statement. (lpr)

8/10/18 Specialty Matched Consultant Advisory Panel review 6/2018. Reference added. No change to policy statement. (lpr)