Optical Coherence Tomography (OCT) is a high-resolution method of imaging the ocular structures. OCT for the anterior segment of the eye is being evaluated as a noninvasive diagnostic and screening tool for the detection of angle closure glaucoma, to assess corneal thickness and opacity, evaluate presurgical and postsurgical anterior chamber anatomy, calculate intraocular lens power, guide laser-assisted cataract surgery, assess complications following surgical procedures, and to image intracorneal ring segments. It is also being studied in relation to pathologic processes such as dry eye syndrome, tumors, uveitis, and infections.

OCT is a noninvasive method that 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™ (Carl Zeiss Meditec), which uses a 0.8-μm wavelength light source, was designed for evaluating the optic nerve head, retinal nerve fiber layer, and retinal thickness. The Zeiss Visante OCT™ and AC Cornea OCT (Ophthalmic Technologies) 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 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.

An early application of OCT technology was the evaluation of the cornea before and after refractive surgery. Because this is a noninvasive procedure that can be conducted by a technician, it has been proposed that this device may provide a rapid diagnostic and screening tool for the detection of angle closure glaucoma. The classification of glaucoma (primary open angle or angle closure) relies heavily on knowledge of the AS 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 one 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 angle closure glaucoma. The treatment for this condition is a peripheral iridotomy (laser) or peripheral iridectomy (surgery).

Slit lamp biomicroscopy is used to evaluate the anterior chamber; however, the chamber angle can only be examined with specialized lenses, the most common of these being the gonioscopic mirror. In this procedure a gonio lens is applied to the surface of the cornea under topical anesthesia and the image magnified with the slit lamp. Gonioscopy is the standard method for clinically assessing the anterior chamber angle. Other techniques for imaging the anterior eye segment include ultrasonography and OCT.

Ultrasonography uses high frequency mechanical pulses (10 to 20 MHz) to build up a picture of the front of the eye. An ultrasound scan along the optical axis assesses corneal thickness, anterior chamber depth, lens thickness and axial length. Ultrasound scanning across the eye creates a two-dimensional image of...
Optical Coherence Tomography (OCT) Anterior Segment of the Eye

the ocular structures. It has a resolution of 100 microns, but only moderately high intra-observer and low inter-observer reproducibility. Ultrasound biomicroscopy (about 50 MHz) has a resolution of 30 to 50 microns. As with gonioscopy, this technique requires placement of a probe under topical anesthesia.

**Regulatory Status**
The Visante™ OCT received marketing clearance through the U.S. Food and Drug Administration (FDA) 510(k) process in 2005, listing the Stratus OCT and Orbscan™ II as predicate devices. The 510(k) summary describes the Visante OCT as “a non-contact, high resolution tomographic and biomicroscopic device indicated for the in vivo imaging and measurement of ocular structures in the anterior segment, such as corneal and LASIK flap thickness.”
The Slit-Lamp OCT (SL-OCT, Heidelberg Engineering, Heidelberg, Germany) received marketing clearance through the FDA’s 510(k) process in 2006. The SL-OCT is intended as an aid for the quantitative analysis of structures and the diagnosis and assessment of structural changes in the anterior segment of the eye. “The SL-OCT examination system is not intended for the analysis of the cross-sectional images to obtain quantitative measured values. Neither the obtained measured values nor the qualitative evaluation of the images should be used as the sole basis for therapy-related decisions.”
The RTVue (Optovue) is a commercially available Fourier-domain OCT system with a resolution of 5 microns that received marketing clearance from the FDA in 2010. Although indicated for posterior segment imaging, a lens is available to allow imaging of the anterior segment. Three available laser systems, the LenSx (Alcon), Catalys (Optimedica), and VICTUS (Technolas Perfect Vision), include OCT to provide image guidance for laser cataract surgery.
The AC Cornea OCT from Canada is not cleared for marketing in the U.S.

**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.
Optical Coherence Tomography (OCT) Anterior Segment of the Eye

BCBSNC does not provide coverage for investigational services or procedures.

Policy Guidelines

Ideally, a diagnostic test would be evaluated based on its technical performance, diagnostic performance (sensitivity, specificity, and predictive value), and clinical utility (effect on health outcomes). Current literature consists primarily of assessments of qualitative and quantitative imaging and detection capabilities. Technically, the Visante OCT has the ability to create high-resolution images of the anterior eye segment. In addition, studies indicate that the Visante OCT detects more eyes with narrow or closed angles than gonioscopy, suggesting that the sensitivity of OCT is higher than gonioscopy. However, because of the lack of a true gold standard, it is not clear to what degree these additional cases are true positives versus false-positives, and therefore the specificity and predictive values cannot be determined. Evaluation of the diagnostic performance depends, therefore, on evidence that the additional eyes identified with narrow angle by OCT are more likely to progress to primary angle closure glaucoma. OCT imaging may be less sensitive in comparison with ultrasound biomicroscopy for other pathologic conditions of the anterior segment, such as cataracts, anterior tumors, ciliary bodies, haptics, and posterior chamber intraocular lenses.

Evaluation of the clinical utility of anterior segment (AS) OCT depends on demonstration of an improvement in clinical outcomes. Outcomes will be improved if OCT detects additional cases of primary angle closure glaucoma, which represent true cases of glaucoma and not false positives, and if these cases are successfully treated for glaucoma. It is not currently possible to determine the frequency of false-positive results with OCT, therefore it cannot be determined whether health outcomes are improved. For other potential indications (e.g., to aid in diagnosis of AS pathology or guide surgical procedures) evidence is currently limited.

Since the impact on health outcomes of anterior segment OCT for angle closure glaucoma, as well as for other disorders of the anterior chamber, is not known, this procedure is considered investigational.

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

Senior Medical Director review - 1/14/2010
Optical Coherence Tomography (OCT) Anterior Segment of the Eye

Specialty Matched Consultant Advisory Panel review- 6/2013

Specialty Matched Consultant Advisory Panel review- 6/2014

Specialty Matched Consultant Advisory Panel review- 6/2015

Policy Implementation/Update Information

For Policy Named: Anterior Eye Segment Optical Imaging


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

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.