Definition: Ophthalmic ultrasonography, also known as echography, uses high-frequency sound waves (ultrasound) to produce images of ocular structures. The two main types of ultrasound used in ophthalmologic practice are A-Scan and B-scan.

Ophthalmic ultrasound includes the following techniques:

- **A-scan ultrasound biometry:**
  
  A-scan (time amplitude scan) ultrasound is a one-dimensional recording of the time taken for echoes to be reflected back to the transducer from surfaces of the eye (cornea, anterior lens, posterior lens, and retina) with vertical spikes that correspond to each tissue interface zone. A-scan ultrasound can be performed using either an applanation or immersion technique. The applanation technique is performed using a probe placed directly on the surface of the cornea. The immersion technique involves placing a saline filled scleral shell between the probe and the eye.

  Intraocular lens power calculation is the determination of the appropriate intraocular lens prior to cataract surgery. Standard intraocular lens power formulas use axial length and corneal curvature along with an intraocular lens constant to predict postoperative intraocular lens position. Precise ophthalmic biometry is essential to achieve the desired refractive outcome in cataract surgery. In A-scan biometry, axial length is the distance between the corneal and retinal echo.

- **Quantitative A-scan ultrasound:**
  
  The other major use of A-scan ultrasonography is to characterize the internal structure of intraocular and orbital lesions. The ability to differentiate tissue depends on correct interpretation of the images that sound (i.e., ultrasound) produces as it travels through a particular type of tissue. Quantitative A-scan ultrasound is also utilized in the measurement of the optic nerve, extraocular muscles, and lacrimal glands.

- **B-scan ultrasound:**
In B-scan, or brightness scan, oscillating sound waves are generated at 10 megahertz (MHz). The data collected by the transducer produces a two-dimensional cross-sectional image, the brightness of which is determined by the strength of the echo, allowing the examiner to determine the density of the tissue for diagnostic purposes. B-scan can accurately image intraocular structures and provide information about the lens, vitreous, retina, choroid, and sclera. B-scan may be used as an alternative to A-scan for axial length determination when visualization of intraocular structures is difficult, such as in patients with dense cataracts or corneal edema. In practice, B-scan and A-scan are often complementary in the evaluation of intraocular and orbital conditions. B-scan provides images of topographic features, such as shape and anatomical relationship to other structures, and A-scan provides information about tissue structure. B-scan is also sensitive to the presence of highly reflective material, such as foreign bodies, although its role in the evaluation of foreign bodies has largely been supplanted by computed tomography (CT) and magnetic resonance imaging (MRI) technologies.

High-resolution ultrasound biomicroscopy involves use of much higher frequencies (35-50 MHz) than those used in conventional opthalmic B-scanners. Higher frequency transducers provide finer resolution of more superficial structures, whereas lower frequency transducers provide greater depth of penetration with less resolution. The image acquisition technique is similar to traditional immersion B-scan ultrasonography. Ultrasound biomicroscopy provides diagnostically significant information in conditions, such as glaucoma, cysts, and neoplasms, and has become a clinically important tool in the qualitative and quantitative assessment of the anterior segment.

- **Corneal pachymetry:**

  Corneal pachymetry refers to the determination of corneal thickness. A commonly used instrument for measurement of corneal thickness is the hand-held ultrasound pachymeter. Accurate measurement of central corneal thickness relies on placement of the probe as close as possible to the central cornea. Other techniques have been developed to measure corneal thickness. These include partial coherence interferometry and optical coherence tomography. Central corneal thickness is an important parameter in patients with glaucoma. Measurement of intraocular pressure, especially with applanation tonometry, may be affected by central corneal thickness. Moreover, central corneal thickness is an independent risk factor for developing glaucomatous optic nerve damage.

- **Optical coherence biometry:**

  Optical coherence biometry by partial coherence interferometry uses a 780 micrometer (μm) laser diode infrared light of short coherence length (160 μm) to measure axial length (slit-lamp illumination is used to measure anterior chamber depth and keratometry to measure corneal curvature). These measurements are then used by an on-board computer system to calculate intraocular lens power for patients who are candidates for intraocular lens implantation. In 10% to 20% of patients, optical coherence biometry cannot measure axial length in patients with extremely dense cataracts and the inability to fixate.
Medical Necessity:

I. **A-scan ultrasound biometry**: The Company considers applanation or immersion A-scan ultrasound† for axial length determination with intraocular power lens calculation (CPT Codes 76519 and applicable ICD-10-PCS Code[s]) medically necessary and eligible for reimbursement when performed prior to cataract surgery with intraocular lens implantation; †B-scan ultrasound, as an alternative to or adjunct to A-scan ultrasound, is considered medically necessary for extremely dense cataracts, high-to-extreme axial myopia or posterior staphyloma.

**NOTE:** Repeat measurement of axial length is not medically necessary. If ophthalmic biometry is performed and later cataract surgery is canceled, repeat biometry is considered medically necessary and eligible for reimbursement (1) if greater than one year has elapsed since biometry was performed (ophthalmic biometry will generally provide valid information for 12 months); or (2) if cataract surgery is subsequently performed by a different surgeon not affiliated with the surgeon who performed biometry.

**AND**

At least one of the following clinical diagnoses is present:

- Age-related cataract
- Diabetic cataract
- Infantile and juvenile cataract
- Traumatic cataract
- Cataract with neovascularization
- Cataract secondary to ocular disorders (degenerative, inflammatory)
- Cataract secondary to glaucomatous flecks (subcapsular)
- Drug-induced cataract
- Aphakia
- Dislocation of lens
- Cataract in diseases classified elsewhere
- Open angle with borderline findings, high risk
- Primary angle closure without glaucoma damage
- Low-tension glaucoma
- Pigmentary glaucoma
- Capsular glaucoma with pseudoexfoliation of lens
- Vitreomacular adhesion
- Congenital cataract
- Congenital lens malformation, unspecified
- Breakdown (mechanical) of intraocular lens, initial encounter
- Displacement of intraocular lens, initial encounter
- Other mechanical complication of intraocular lens, initial encounter
II. **Quantitative A-scan ultrasound:** The Company considers quantitative applanation or immersion A-scan ultrasound (CPT Codes 76511 and applicable ICD-10-PCS Code[s]) **medically necessary** and eligible for reimbursement providing it is integral to decision-making and that **at least one** of the following clinical diagnoses is present:

- Malignant neoplasm of eye
- Benign neoplasm of eye
- Hemangioma of retina
- Toxic goiter
- Thyrotoxicosis
- Retinal detachment
- Bullous retinoschisis
- Defect of retina without detachment
- Traction detachment of retina
- Retinal layer separation
- Central serous retinopathy
- Serous detachment of retinal pigment epithelium
- Choroidal detachment, unspecified
- Serous choroidal detachment
- Hemorrhagic choroidal detachment
- Hyphema of iris and ciliary body
- Anatomical narrow angle borderline glaucoma
- Open angle with borderline findings
- Primary angle closure without glaucoma damage
- Glaucoma (mild, moderate, severe, indeterminate, unspecified) stage
- Nonsenile cataract
- Pseudoexfoliation of lens capsule
- Senile cataract
- Senile nuclear sclerosis
- Total or mature cataract
- Hypermature cataract
- Traumatic cataract
- Localized traumatic opacities
- Cataract secondary to glaucomatous flecks (subcapsular)
- Cataract secondary to ocular disorders (degenerative, inflammatory)
• Drug-induced cataract
• Cataract associate with radiation and other physical influences
• Soemmering’s ring
• Refractive amblyopia
• Corneal opacity
• Adherent leucoma
• Phthisical cornea
• Corneal edema
• Bullous keratopathy
• Band-shaped keratopathy
• Acute inflammation of orbit
• Orbital cellulitis, periostitis, osteomyelitis, or tendonitis
• Chronic inflammation of orbit
• Orbital granuloma
• Orbital myositis
• Parasitic infestation of orbit
• Thyrotoxic exophthalmos
• Exophthalmic ophthalmoplegia
• Exophthalmos
• Orbital hemorrhage
• Orbital edema or congestion
• Lateral displacement of globe
• Deformity of orbit unspecified
• Hypertelorism of orbit
• Exostosis of orbit
• Orbital deformity
• Atrophy or enlargement of orbit
• Enophthalmos
• Retained foreign body following penetrating wound of orbit
• Orbital cyst
• Myopathy of extraocular muscles
• Drusen of optic disc
• Posterior scleritis
• Vitreous degeneration
• Crystalline deposits in vitreous
• Vitreous hemorrhage
• Vitreomacular adhesion
• Persistent miosis not due to miotics
• Disorder of eye unspecified
• Pain in or around eye
• Swelling or mass of eye
• Redness or discharge of eye
• Cystic eyeball, congenital
• Cryptophthalmos
• Microphthalmos
• Buphthalmos
• Congenital cataract
• Congenital aphakia
• Congenital anomalies of lens shape
• Congenital ectopic lens
• Other congenital cataract and lens anomalies
• Vitreous anomalies, congenital
• Ocular laceration
• Rupture of eye with partial loss of intraocular tissue
• Penetration of eyeball with foreign body

III. **B-scan ultrasound:** The Company considers applanation or immersion B-scan ultrasound (with or without complementary A-scan) (**CPT Codes 76510, 76512, 76513, 76529†† and applicable ICD-10-PCS Code[s])** **medically necessary** and eligible for reimbursement providing it is integral to decision-making and that **at least one** of the following clinical diagnoses is present:

• Malignant neoplasm of eye
• Benign neoplasm of eye
• Hemangioma of retina
• Toxic goiter
• Thyrotoxicosis
• Endophthalmitis
• Panophthalmitis
• Vitreous abscess
• Progressive degenerative myopia
• Foreign body in eye
• Retinal detachment
• Bullous retinoschisis
• Defect of retina without detachment
• Traction detachment of retina
• Retinal layer separation
• Central serous retinopathy
• Serous detachment of retinal pigment epithelium
• Choroidal detachment, unspecified
Medical Policy

- Serous choroidal detachment
- Hemorrhagic choroidal detachment
- Hyphema of iris and ciliary body
- Anatomical narrow angle borderline glaucoma
- Open angle with borderline findings
- Primary angle closure without glaucoma damage
- Glaucoma (mild, moderate, severe, indeterminate, unspecified) stage
- Nonsenile cataract
- Pseudoexfoliation of lens capsule
- Senile cataract
- Senile nuclear sclerosis
- Total or mature cataract
- Hypermature cataract
- Traumatic cataract
- Localized traumatic opacities
- Cataract secondary to glaucomatous flecks (subcapsular)
- Cataract secondary to ocular disorders (degenerative, inflammatory)
- Drug-induced cataract
- Cataract associate with radiation and other physical influences
- Soemmering’s ring
- Refractive amblyopia
- Corneal opacity
- Adherent leucoma
- Phthisical cornea
- Corneal edema
- Bullous keratopathy
- Band-shaped keratopathy
- Acute inflammation of orbit
- Orbital cellulitis, periostitis, osteomyelitis, or tendinitis
- Chronic inflammation of orbit
- Orbital granuloma
- Orbital myositis
- Parasitic infestation of orbit
- Thyrotoxic exophthalmos
- Exophthalmic ophthalmoplegia
- Exophthalmos
- Orbital hemorrhage
- Orbital edema or congestion
- Lateral displacement of globe
- Deformity of orbit unspecified
• Hypertelorism of orbit
• Exostosis of orbit
• Orbital deformity
• Atrophy or enlargement of orbit
• Enophthalmos
• Retained foreign body following penetrating wound of orbit
• Orbital cyst
• Myopathy of extraocular muscles
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• Vitreous degeneration
• Crystalline deposits in vitreous
• Vitreous hemorrhage
• Vitreomacular adhesion
• Persistent miosis not due to miotics
• Disorder of eye unspecified
• Pain in or around eye
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• Redness or discharge of eye
• Cystic eyeball, congenital
• Cryptophthalmos
• Microphthalmos
• Buphthalmos
• Congenital cataract
• Congenital aphakia
• Congenital anomalies of lens shape
• Congenital ectopic lens
• Other congenital cataract and lens anomalies
• Vitreous anomalies, congenital
• Ocular laceration
• Rupture of eye with partial loss of intraocular tissue
• Penetration of eyeball with foreign body

††Use CPT code 76529 only when B-scan ultrasound is used to locate a foreign body in the eye, for ocular laceration, rupture of eye, or penetration of eyeball with a foreign body.

IV. Diagnostic corneal pachymetry: The Company considers corneal ultrasound pachymetry (CPT Code 76514 and applicable ICD-10-PCS Code[s]) medically necessary and eligible for reimbursement providing it is integral to decision-making in at least one of the following clinical conditions:
• Corneal edema; or
• Adhesions, disruptions, or degenerations of iris and ciliary body; or
• Hereditary corneal dystrophies; Fuchs’ endothelial dystrophy; bullous keratopathy; posterior polymorphous dystrophy; or
• Glaucoma or suspected glaucoma with elevated (>24 millimeters of mercury [mm Hg]) intraocular pressure (once per lifetime except when there has been corneal trauma or surgery); or
• Evaluation prior to cataract surgery in a patient with known corneal endothelial abnormalities; or
• Corneal transplantation (pretransplant evaluation, post-transplant monitoring for graft failure); or
• Diagnosis and monitoring of progression of corneal thinning disorders, such as keratoconus; or
• Complications of refractive surgery; or
• Mechanical complication of other specified prosthetic device, implant, or graft

AND

At least one of the following clinical diagnoses is present:

• Bullous keratopathy
• Peripheral corneal degeneration
• Corneal dystrophy
• Keratoconus
• Recession of chamber angle
• Preglaucoma
• Open angle with borderline findings
• Anatomical narrow angle
• Steroid responder
• Ocular hypertension
• Primary angle closure without glaucoma
• Open-angle glaucoma
• Low-tension glaucoma
• Pigmentary glaucoma
• Capsular glaucoma
• Residual stage open-angle glaucoma
• Unspecified primary angle-closure glaucoma
• Acute angle-closure glaucoma
• Chronic angle-closure glaucoma
• Intermittent angle-closure glaucoma
• Residual stage angle-closure glaucoma
• Glaucoma secondary to eye trauma
• Glaucoma secondary to eye inflammation
• Glaucoma secondary to other eye disorders
Medical Policy

- Glaucoma secondary to drugs
- Glaucoma with increased episcleral venous pressure
- Hypersecretion glaucoma
- Aqueous misdirection
- Congenital glaucoma
- Mechanical breakdown of ocular prosthetic devices, implants, and grafts, initial encounter
- Displacement of other ocular prosthetic devices, implants, and grafts, initial encounter
- Corneal transplant rejection or failure

Corneal pachymetry for evaluation of persons undergoing corneal refractive surgery is not medically necessary.

V. Optical coherence biometry by partial coherence interferometry: The Company considers partial coherence interferometry for axial length determination with intraocular power lens calculation (CPT Code 92136) medically necessary and eligible for reimbursement, as an alternative to A-scan or B-scan ultrasound biometry, when:

- Performed prior to cataract surgery with intraocular lens implantation;

AND

At least one of the following clinical diagnoses is present:

- Diabetic cataract
- Age-related cataract
- Infantile and juvenile cataract
- Traumatic cataract
- Cataract with neovascularization
- Cataract secondary to ocular disorders (degenerative, inflammatory)
- Cataract secondary to glaucomatous flecks (subcapsular)
- Drug-induced cataract
- Aphakia
- Dislocation of lens
- Cataract in diseases classified elsewhere
- Open angle with borderline findings, high risk
- Primary angle closure without glaucoma damage
- Low-tension glaucoma
- Pigmentary glaucoma
- Capsular glaucoma with pseudoxfoliation of lens
- Vitreomacular adhesion
- Congenital cataract
Medical Policy

- Congenital lens malformation, unspecified
- Breakdown (mechanical) of intraocular lens, initial encounter
- Displacement of intraocular lens, initial encounter
- Other mechanical complication of intraocular lens, initial encounter
- Infection and inflammatory reaction due to other internal prosthetic devices, implants, and grafts, initial encounter
- Corneal transplant infection
- Presence of intraocular lens

NOTE: Repeat measurement of axial length is not medically necessary. If ophthalmic biometry is performed and later cataract surgery is canceled, repeat biometry is considered medically necessary and eligible for reimbursement (1) if greater than one year has elapsed since biometry was performed (ophthalmic biometry will generally provide valid information for 12 months); or (2) if cataract surgery is subsequently performed by a different surgeon not affiliated with the surgeon who performed biometry.

Documentation Requirements:

The Company reserves the right to request additional documentation as part of its coverage determination process. The Company may deny reimbursement when it has determined that the services performed were not medically necessary, investigational or experimental, not within the scope of benefits afforded to the member, and/or a pattern of billing or other practice has been found to be either inappropriate or excessive. Additional documentation supporting medical necessity for the services provided must be made available upon request to the Company. Documentation requested may include patient records, test results, and/or credentials of the provider ordering or performing a service. The Company also reserves the right to modify, revise, change, apply, and interpret this policy at its sole discretion, and the exercise of this discretion shall be final and binding.
Sources of Information:

### Applicable Code(s):

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