## Medical Policy

**BlueCross BlueShield of Kansas**

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**Title:          Corneal Topography/Computer-Assisted Corneal Topography/Photokeratoscopy**

**Professional**
Original Effective Date:  January 1, 2007
Revision Date(s):  December 9, 2011;
July 12, 2013; July 8, 2015; April 27, 2016;
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April 24, 2019
Current Effective Date:  December 9, 2011

**Institutional**
Original Effective Date:  December 20, 2010
Revision Date(s):  December 9, 2011;
July 12, 2013; July 8, 2015; April 27, 2016;
April 12, 2017; April 11, 2018;
April 24, 2019
Current Effective Date: December 9, 2011

| Populations | Interventions | Comparators | Outcomes |
|---|---|---|---|
| Individuals:<br>• With disorders of corneal topography | Interventions of interest are:<br>• Computer-assisted corneal topography/photokeratoscopy | Comparators of interest are:<br>• Manual corneal topography measurements | Relevant outcomes include:<br>• Test accuracy<br>• Other test performance measures<br>• Functional outcomes |

## DESCRIPTION

Computer-assisted corneal topography (also called photokeratoscopy or video-keratography) provides a quantitative measure of corneal curvature. Measurement of

corneal topography is being evaluated to aid the diagnosis of and follow-up for corneal disorders such as keratoconus, difficult contact lens fits, and pre- and postoperative assessment of the cornea, most commonly after refractive surgery.

## OBJECTIVE

The objective of this policy is to evaluate whether computer-assisted corneal topography improves health outcomes for patients with disorders of corneal topography, such as keratoconus.

## BACKGROUND

Detection and Monitoring Diseases of the Cornea

Corneal topography describes measurements of the curvature of the cornea. An evaluation of corneal topography is necessary for the accurate diagnosis and follow-up of certain corneal disorders, such as keratoconus, difficult contact lens fits, and pre- and postoperative assessment of the cornea, most commonly after refractive surgery.

Assessing corneal topography is a part of the standard ophthalmologic examination of some patients.[1,2] Corneal topography can be evaluated and determined in multiple ways. Computer-assisted corneal topography has been used for early identification and quantitative documentation of the progression of keratoconic corneas, and evidence is sufficient to indicate that computer-assisted topographic mapping can detect and monitor disease.

Various techniques and instruments are available to measure corneal topography: keratometer, keratoscope, and computer-assisted photokeratoscopy.

The keratometer (also referred to as an ophthalmometer), the most commonly used instrument, projects an illuminated image onto a central area in the cornea. By measuring the distance between a pair of reflected points in both of the cornea's two principal meridians, the keratometer can estimate the radius of curvature of two meridians. Limitations of this technique include the fact that the keratometer can only estimate the corneal curvature over a small percentage of its surface and that estimates are based on the frequently incorrect assumption that the cornea is spherical.

The keratoscope reflects a series of concentric circular rings off the anterior corneal surface. Visual inspection of the shape and spacing of the concentric rings provides a qualitative assessment of topography.

A photokeratoscope is a keratoscope equipped with a camera that can provide a permanent record of the corneal topography.  Computer-assisted photokeratoscopy is an alternative to keratometry or keratoscopy in measuring corneal curvature. This technique uses sophisticated image analysis programs to provide quantitative corneal topographic data. Early computer-based programs were combined with keratoscopy to create graphic displays and high-resolution, color-coded maps of the corneal surface. Newer

technologies measure both curvature and shape, enabling quantitative assessment of corneal depth, elevation, and power.

## REGULATORY STATUS

A number of devices have been cleared for marketing by the Food and Drug Administration (FDA) through the 510(k) mechanism. In 1999, the Orbscan® (manufactured by Orbtek and distributed by Bausch and Lomb) was cleared by FDA. The second-generation Orbscan II is a hybrid system that uses both projective (slit scanning) and reflective (Placido) methods. The Pentacam® (Oculus) is one of a number of rotating Scheimpflug imaging systems produced in Germany. In 2005, the Pentacam HR was released with a newly designed high-resolution camera and improved optics. FDA product code: MXK.

**Table 1.** Corneal Topography Devices Clearing by the US Food and Drug Administration

| Device | Manufacturer | Date Cleared | 510.k No. | Indication |
|---|---|---|---|---|
| VX130 Ophthalmic Diagnostic Device | LUNEAU SAS | 4/24/2017 | K162067 | To scan, map and display the geometry of the anterior segment of the eye |
| Pentacam AXL | OCULUS OPTIKGERATE GMBH | 1/20/2016 | K152311 | To scan, map and display the geometry of the anterior segment of the eye |
| ARGOS | SANTEC CORPORATION | 10/2/2015 | K150754 | To scan, map and display the geometry of the anterior segment of the eye |
| ALLEGRO OCULYZER | WAVELIGHT AG | 7/20/2007 | K071183 | To scan, map and display the geometry of the anterior segment of the eye |
| HEIDELBERG ENGINEERING SLITLAMP-OCT (SL-OCT) | HEIDELBERG ENGINEERING | 1/13/2006 | K052935 | To scan, map and display the geometry of the anterior segment of the eye |
| CM 3910 ROTATING DOUBLE SCHEIMPFLUG CAMERA | SIS LTD. SURGICAL INSTRUMENT SYSTEMS | 9/28/2005 | K051940 | To scan, map and display the geometry of the anterior segment of the eye |
| PATHFINDER | MASSIE RESEARCH LABORATORIES INC. | 9/2/2004 | K031788 | To scan, map and display the geometry of the anterior segment of the eye |
| NGDI (NEXT GENERATION DIAGNOSTIC INSTRUMENT) | BAUSCH & LOMB | 7/23/2004 | K040913 | To scan, map and display the geometry of the anterior segment of the eye |
| PENTACAM SCHEIMPFLUG CAMERA | OCULUS OPTIKGERATE GMBH | 9/16/2003 | K030719 | To scan, map and display the geometry of the anterior segment of the eye |
| ANTERIOR EYE-SEGMENT ANALYSIS SYSTEM | NIDEK INC. | 8/6/1999 | K991284 | To scan, map and display the geometry of the anterior segment of the eye |
| ORBSCAN | TECHNOLAS PERFECT VISION GMBH | 3/5/1999 | K984443 | To scan, map and display the geometry of the anterior segment of the eye |
| VX130 Ophthalmic Diagnostic Device | LUNEAU SAS | 4/24/2017 | K162067 | To scan, map and display the geometry of the anterior segment of the eye |

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## POLICY

I.   <u>Non-Computer-Assisted Corneal Topography</u>
Non-computer-assisted corneal topography is considered part of the evaluation and management services of general ophthalmological services, and therefore this service should not be billed separately. There is no separate CPT code for this type of corneal topography.

II.  <u>Computer-Assisted Corneal Topography</u>
   A.   Routine computer-assisted corneal topography is considered **not medically necessary** to detect or monitor diseases of the cornea.

   B.   Computer-assisted corneal topography may be **medically necessary** for any of the following conditions:
   1.   Pre- and post-penetrating keratoplasty and pre- and post kerato-refractive surgery for irregular astigmatism, or
   2.   Corneal dystrophy and complications of transplanted cornea; or
   3.   Diagnosing and monitoring disease progression in keratoconus; or
   4.   Post-traumatic or post infectious corneal scarring
   5.   Refractive surgery only for symptomatic anisometropia

   C.   Computer-assisted corneal topography is **non-covered** for the following indications:
   1.   When used in conjunction with preoperative evaluation for cataract surgery including refractive intraocular lens (IOL) exchange and premium channel IOL cataract surgery.
   2.   For difficult fitting of contact lens not associated with refractive surgery.
   3.   Refractive surgery, except when medically necessary for anisometropia.

   D.   Initial and repeat computer-assisted corneal topography that is not clearly medically indicated will be denied **not medically necessary**.

## RATIONALE

The most recent literature update was performed through January 6, 2019.

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function - including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the

intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. Randomized controlled trials are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

We evaluated the literature with a focus on the question most pertinent to this evidence review: Does quantitative measurement result in a management change that improves health outcomes?

## Computer-Assisted Corneal Topography/Photokeratoscopy
Clinical Context and Therapy Purpose
The purpose of computer-assisted corneal topography/photokeratoscopy is to provide a diagnostic option that is an alternative to or an improvement on existing therapies, such as manual corneal topography measurements, in patients with disorders of corneal topography.

The question addressed in this evidence review is: does computer-assisted corneal topography improve health outcomes for patients with disorders of corneal topography, such as keratoconus.?

The following PICOTS were used to select literature to inform this review.

Patients
The relevant population of interest are individuals with disorders of corneal topography.

Interventions
The test being considered is computer-assisted corneal topography/photokeratoscopy.

Comparators
Comparators of interest include Manual corneal topography measurements. Treatment includes artificial tears, corneal implants, corrective lenses, and contact lenses.

Outcomes
The general outcomes of interest are test accuracy, other test performance measures, and functional outcomes.

Timing
Identifying clinically validity and usefulness requires short term follow up. Evaluating functional outcomes may require longer follow up.

Setting
The patient takes the LIPUS device home and self-administers the treatment. Recommended time of treatment administration is 20 minutes/day.

Study Selection Criteria
Patients with disorders of corneal topography are actively managed by ophthalmologists, optometrists and primary care providers in an outpatient clinical setting.

Study Selection Criteria
Below are selection criteria for studies to assess whether a test is clinically valid.
    a. The study population represents the population of interest. Eligibility and selection are described.
    b. The test is compared with a credible reference standard.
    c. If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
    d. Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (eg, ROC, AUROC, c-statistic, likelihood ratios) may be included but are less informative.
    e. Studies should also report reclassification of diagnostic or risk category.

Simplifying Test Terms
There are 3 core characteristics for assessing a medical test. Whether imaging, laboratory, or other, all medical tests must be:
    • Technically reliable
    • Clinically valid
    • Clinically useful.

Because different specialties may use different terms for the same concept, we are highlighting the core characteristics. The core characteristics also apply to different uses of tests, such as diagnosis, prognosis, and monitoring treatment.

Diagnostic tests detect presence or absence of a condition. Surveillance and treatment monitoring are essentially diagnostic tests over a time frame. Surveillance to see whether a condition develops or progresses is a type of detection. Treatment monitoring is also a type of detection, because the purpose is to see if treatment is associated with the disappearance, regression, or progression of the condition.

Prognostic tests predict the risk of developing a condition in the future. Tests to predict response to therapy are also prognostic. Response to therapy is a type of condition, and can be either a beneficial response or adverse response. The term predictive test is often used to refer to response to therapy. To simplify terms, we use prognostic to refer both to predicting a future condition or to predicting a response to therapy.

Technically Reliable
Assessment of technical reliability focuses on specific tests and operators and requires review of unpublished and often proprietary information. Review of specific tests, operators, and unpublished data are outside the scope of this evidence review and alternative sources exist. This evidence review focuses on the clinical validity and clinical utility.

Clinically Valid
A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Martinez-Abad et al (2017) sought to determine whether 3 vector parameters¾ocular residual astigmatism (ORA), topography disparity (TD), and corneal topographic astigmatism (anterior and total)¾could serve to detect clinical and subclinical keratoconus.[3,] One hundred sixty-one eyes were studied in this retrospective comparative study; 61 eyes (38 patients) with keratoconus; 19 eyes (16 patients) with subclinical keratoconus; and a control group of 100 healthy eyes. All study participants underwent a thorough eye exam; further, software was used (iASSORT) to calculate ORA, TD, and corneal topographic astigmatism. Using a receiver operating characteristic curve analysis, the diagnostic capabilities of the 3 parameters were measured; to further assess diagnostic ability, a cutoff was determined that correlated to the highest sensitivity and specificity of the curve. Results showed that ORA and TD had good diagnostic capability to detect keratoconus (ORA: cutoff, 1.255 diopters [D]; sensitivity: 82%; specificity: 92%; TD: cutoff, 1.035 D; sensitivity, 78.5%; specificity, 86%). corneal topographic astigmatism did not show potential as a diagnostic tool.

*Section Summary: Clinically Valid*
One study has been identified evaluating computer-assisted corneal topography as a clinical valid solution for diagnosing disorders of corneal topography. In it, authors concluded that TD and ORA, two vector parameters that could serve to detect clinical and subclinical keratoconus, were beneficial tools for detecting the disorder.

Clinically Useful
A test is clinically useful if use of the results inform management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence
Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from randomized controlled trials.

Of note, published studying discussing the use of computer-assisted corneal topography for contact lens fitting and for corneal astimatism measurements for toric intraocular lens implantation.

*Contact Lens Fitting*
In a study of computer-assisted corneal topography, Bhatoa et al (2010) assessed the design of gas-permeable contact lens in 30 patients with keratoconus who were recruited in 2005 and 2006.[4,] The report indicated that the subjects were consecutive, although patients whose topographic plots could not be used were excluded (number not described). The fit of the new lens was compared with the fit of the patient's habitual lens (randomized order on the same day). Clinical evaluation showed a good fit (no or minor modification needed) for more than 90% of the computer-designed lens. However, progression of keratoconus causes a bias favoring the most recently fitted lens, confounding comparison between the new computer-designed lens and the patient's habitual lens. Trial design and reporting gaps limit conclusions that can be drawn from this study.

Weber et al (2016) reported on a prospective, observational study evaluating the association between computer-assisted corneal topography measurements (Pentacam) and scleral contact

lens fit.[5,] The study included 47 patients (63 eyes) with a variety of indications for scleral contact lenses, most commonly (n=24 eyes) keratoconus. Pentacam measurements correlated with a subset of the scleral contact lens parameters (corneal astigmatism, anterior chamber depth, and corneal height; $p<0.001$, not adjusted for multiple comparisons) for the group as a whole.

DeNaeyer et al (2017) investigated the use of the sMap3D system (Precision Ocular Metrology), which measures the surface of the eye for patients in need of a scleral contact lens fitting.[6,] The sMap3D captures a series of images to produce a single wide field topographic "stitched" image of all captured images. To create these images, the patient is asked to provide several "gazes" (gaze up, gaze down, gaze straight). Twenty-five eyes (from 23 patients) were examined using the sMap3D. The "stitched" image produced by the sMap3D was then compared with the single captured straight-gaze image. At a diameter of 10 mm from the corneal center, both straight-gaze image and the sMap3D stitched image displayed 100% coverage of the eye. However, at 14 mm, the straight-gaze image only mapped 68% of the eye; at 15 mm, 53%; at 16 mm, 39%, and at 20 mm, 6%. For the stitched image produced by sMap3D: at 14 mm, 98% coverage; at 15 mm, 96% coverage; at 16 mm, 93% coverage; and at 20 mm, 32% coverage. While there was a significant drop off in coverage between 16 mm and 20 mm for the sMap3D image, the stitched image was considerably more accurate than the straight-gaze image.

Bandlitz et al (2017) studied the profile of the limbal sclera in 8 meridians by using spectral domain optical coherence tomography and a confocal scanning laser ophthalmoscope.[7,] The objective of this study was to evaluate the relation between central corneal radii, corneal eccentricity, and scleral radii improve soft and scleral contact lenses. The limbal scleral radii of 30 subjects were measured. Eight meridians, each 45° apart, were scanned, and it was determined that corneal eccentricity and scleral radii did not correlate in any of the meridians. The authors concluded that the independence between meridians might prove useful in fitting soft and scleral contact lenses.

**Table 2.** Summary of Key Nonrandomized Study Characteristics

| Study | Study.Type | Country | Dates | Participants | Treatment1 | Treatment2 | Follow.Up |
|---|---|---|---|---|---|---|---|
| Bhatoa (2010)[4,] | Randomized, prospective | UK | 2005-2006 | Patients with keratoconus (n=30) | Gas-permeable contact lenses made using Fitscan RGP fitting software | Patients habitual RGP contact lenses | NR |
| Weber (2016)[5,] | Prospective, observational | Brazil | 2013 | Patients with a variety of indications for scleral contact lenses (n=47 patients, 63 eyes) | Pentacam derived topography variables for SCL fit | | NR |
| DeNaeyer (2017)[6,] | Retrospective | US | 2016 | Patients presenting for scleral lens fitting (n=23 patients, 25 eyes) | sMap3D stitched imaging | Straight-gaze imaging | NR |

RGP: rigid gas permeable; NR: not reported; SCL: scleral contact lens.

**Table 3.** Summary of Key Nonrandomized Study Results

| Study | Agreement Levels Between. Techniques | Correlations between SCL Parameters and ACD and Hm | Eye Coverage at 10, 14, 16, and 20mm |
|---|---|---|---|
| Bhatoa (2010)[4,] | 74%-100% | | |
| Weber (2016)[5,] | | p<0.001, each | |
| DeNaeyer (2017)[6,] | | | |
| Straight-gaze | | | 100%, 68%, 39%, 6% |
| Stitched | | | 100%, 98%, 93%, 32% |

SCL: scleral contact lens; ACD: anterior chamber depth; Hm: Pentacam-measured corneal height.

**Corneal Astigmatism Measurements for Toric Intraocular Lens Implantation**

Lee et al (2012) reported on a prospective comparative study of 6 methods for measuring corneal astigmatism to guide toric intraocular lens (IOL) implantation.[8,] Astigmatism was evaluated in 257 eyes (141 patients) using manual keratometry, autokeratometry, partial coherence interferometry (IOLMaster), ray-tracing aberrometry (iTrace), scanning-slit topography (Orbscan), and Scheimpflug imaging (Pentacam). Each instrument's measurements were masked to the results for the other instruments. The study found no significant difference between instruments, indicating no advantage to computerized corneal topography over manual keratometry.

De Sanctis et al (2017) reported on corneal astigmatism in patients seeking toric IOL implantation.[9,] The authors compared 2 methods for measuring corneal astigmatism: (1) corneal astigmatism total corneal refractive power ($CA_{TCRP}$), which uses a ray-tracing method that sends light through the cornea; and (2) corneal astigmatism simulated keratometry ($CA_{SimK}$), which is a surface-based exterior measurement that measures the steep radius of the anterior cornea. Both methods relied on the camera system (Pentacam HR) to calculate vector differences. Of 200 patients, 77 individuals (60 eyes) remained for IOL implantation. For a patient to qualify for toric IOL implantation, corneal astigmatism had to be greater than 1 D. Using corneal astigmatism total corneal refractive power $CA_{TCRP}$,17 eyes were found with greater than 1 D; using $CA_{SimK}$, 13 eyes were found with greater than 1 D. However, of the 77 IOL implantation candidates, the $CA_{SimK}$ method assessed 17 patients to have corneal astigmatism less than or equal to 1 D. Moreover, the $CA_{SimK}$ method found 13 of 123 patients who were *not* candidates for implantation to have astigmatism greater than 1 D. This difference suggested potential issues with patient selection criteria.

Chain of Evidence

Indirect evidence on clinical utility rests on clinical validity. As the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

- Establishing the diagnosis and initiating or directing treatment of the disease and evaluation by an ophthalmologist.

*Section Summary: Clinically Useful*

Direct evidence for the clinical usefulness of computer-assisted corneal topography in diagnosing those with disorders of corneal topography is lacking. A chain of evidence for clinical validity provides a chain of evidence on clinical usefulness of this testing.

## SUMMARY OF EVIDENCE

For individuals who have disorders of corneal topography who receive computer-assisted corneal topography/photokeratoscopy, the evidence includes only a few studies. Relevant outcomes are test accuracy, other test performance measures, and functional outcomes. With the exception of refractive surgery, a procedure not discussed herein, no studies have shown clinical benefit (eg, a change in treatment decisions) based on a quantitative evaluation of corneal topography. In addition, a large prospective series found no advantage with use of different computer-assisted corneal topography methods over manual corneal keratometry. Computer-assisted corneal topography lacks evidence from appropriately constructed clinical trials that could confirm whether it improves outcomes. The evidence is insufficient to determine the effects of the technology on health outcomes.

## PRACTICE GUIDELINES AND POSITION STATEMENTS

A 1999 American Academy of Ophthalmology (AAO) assessment indicates that computer-assisted corneal topography evolved from the need to measure corneal curvature and topography more comprehensively and accurately than keratometry and that corneal topography is used primarily for refractive surgery.[10] The AAO indicates several other potential uses: 1) evaluate and manage patients following penetrating keratoplasty, 2) plan astigmatic surgery, 3) evaluate patients with unexplained visual loss and document visual complications, and 4) fit contact lenses. However, the AAO assessment noted that data are lacking to support the use of objective measurements, as opposed to subjective determinants (subjective refraction) of astigmatism.

## U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATIONS

Not applicable.

## ONGOING AND UNPUBLISHED CLINICAL TRIALS

A search of ClinicalTrials.gov in February 2019 did not identify any ongoing or unpublished trials that would likely influence this policy.

## CODING

**The following codes for treatment and procedures applicable to this policy are included below for informational purposes.  Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.**

CPT/HCPCS

 92025     Computerized corneal topography, unilateral or bilateral, with interpretation and report

- There is a specific CPT code for computer-assisted corneal topography: 92025
- Non-computer-assisted corneal topography should be considered inclusive to evaluation and management services.

ICD-10 Diagnoses

   H17.11     Central corneal opacity, right eye
   H17.12     Central corneal opacity, left eye

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| | |
|---|---|
| H17.13 | Central corneal opacity, bilateral |
| H17.821 | Peripheral opacity of cornea, right eye |
| H17.822 | Peripheral opacity of cornea, left eye |
| H17.823 | Peripheral opacity of cornea, bilateral |
| H17.89 | Other corneal scars and opacities |
| H18.51 | Endothelial corneal dystrophy |
| H18.52 | Epithelial (juvenile) corneal dystrophy |
| H18.53 | Granular corneal dystrophy |
| H18.54 | Lattice corneal dystrophy |
| H18.55 | Macular corneal dystrophy |
| H18.59 | Other hereditary corneal dystrophies |
| H18.601 | Keratoconus, unspecified, right eye |
| H18.603 | Keratoconus, unspecified, bilateral |
| H18.611 | Keratoconus, stable, right eye |
| H18.612 | Keratoconus, stable, left eye |
| H18.613 | Keratoconus, stable, bilateral |
| H18.621 | Keratoconus, unstable, right eye |
| H18.622 | Keratoconus, unstable, left eye |
| H18.623 | Keratoconus, unstable, bilateral |
| H52.211 | Irregular astigmatism, right eye |
| H52.212 | Irregular astigmatism, left eye |
| H52.213 | Irregular astigmatism, bilateral |
| H52.31 | Anisometropia |
| Q13.4 | Other congenital corneal malformations |
| T85.318A | Breakdown (mechanical) of other ocular prosthetic devices, implants and grafts, initial encounter |
| T85.328A | Displacement of other ocular prosthetic devices, implants and grafts, initial encounter |
| T85.398A | Other mechanical complication of other ocular prosthetic devices, implants and grafts, initial encounter |
| T86.840 | Corneal transplant rejection |
| T86.841 | Corneal transplant failure |
| Z94.7 | Corneal transplant status |

## REVISIONS

| | |
|---|---|
| 12-20-2010 | Policy added to the bcbsks.com web site. |
| 12-09-2011 | In the Policy section;<br>• Item B, #5, added "symptomatic" to read "Refractive surgery only for symptomatic anisometropia." |
| | Updated Rationale section. |
| | Updated Reference section. |
| 07-12-2013 | Updated Description section. |
| | Updated Rationale section. |
| | In Coding section:<br>▪ Added ICD-10 Diagnosis codes *(Effective October 1, 2014)* |

| | | |
|---|---|---|
| | Updated Reference section. | |
| 07-08-2015 | Updated Description section. | |
| | Updated Rationale section. | |
| | Updated References section. | |
| 04-27-2016 | Updated Description section. | |
| | Updated Rationale section. | |
| 04-12-2017 | Updated Description section. | |
| | Updated Rationale section. | |
| | Updated References section. | |
| 04-11-2018 | Updated Description section. | |
| | Updated Rationale section. | |
| | In Coding section:<br>▪ Removed ICD-9 codes. | |
| | Updated References section. | |
| 04-24-2019 | Updated Description section. | |
| | Updated Rationale section. | |
| | Updated References section. | |

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## **Other References**

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2. Blue Cross and Blue Shield of Kansas Ophthalmology consultant (#604), March 2, 2010.
3. Blue Cross and Blue Shield of Kansas Ophthalmology consultant (#604), March 16, 2010.

4.  MCOP board certified Ophthalmology and Fellowship trained Vitreo-Retinal surgeon consultant, MCOP ID 2065-7017, Reviewer ID 2656, March 29, 2010.
5.  Blue Cross and Blue Shield of Kansas Ophthalmology Liaison Committee, May 2010; May 2011; May 2012.
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