



# Kansas City

An Independent Licensee of the Blue Cross and Blue Shield Association

## Corneal Topography / Computer-Assisted Photokeratoscopy

**Policy Number:** 9.03.05

**Origination:** 10/2000

**Last Review:** 10/2014

**Next Review:** 10/2015

### **Policy**

Blue Cross and Blue Shield of Kansas City (Blue KC) will not provide coverage for corneal topography.

### **When Policy Topic is covered**

Not Applicable.

### **When Policy Topic is not covered**

Computer-assisted corneal topography is considered **not medically necessary** to detect or monitor diseases of the cornea.

### **Considerations**

Non-computer assisted corneal topography is considered part of the evaluation/and management services of general ophthalmological services (CPT codes 92002–92014), and therefore this service should not be billed separately. There is no separate CPT code for this type of corneal topography.

### **Description of Procedure or Service**

Computer-assisted topography/photokeratoscopy provides a quantitative measure of corneal curvature. Measurement of corneal topography is being evaluated for the diagnosis and follow-up of corneal disorders such as keratoconus, difficult contact lens fits, and pre- and postoperative assessment of the cornea, most commonly after refractive surgery.

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. Various techniques and instruments are available to measure corneal topography:

- 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. 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, are limitations of this technique.
- The keratoscope is an instrument that 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. For example, computer-based programs can combine with keratoscopy to create graphic displays and high-resolution color-coded maps of the corneal surface.

A number of devices have received clearance for marketing through the U.S. Food and Drug Administration (FDA) 510(k) mechanism. The Orbscan (manufactured by Orbtek and distributed by Bausch and Lomb) received FDA clearance in 1999. 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.

## **Rationale**

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This policy was created in 1997 and updated periodically using the MEDLINE database. The most recent literature update was performed for through March 3, 2014

## **Detection and Monitoring Diseases of the Cornea**

Assessing corneal topography has been done for many years and is a part of the standard ophthalmologic examination of some patients.(1,2) However, 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. However, the question that is pertinent to this policy is whether quantitative measurement results in an intervention change that improves health outcomes.

## **Contact Lens Fitting in Patients with Keratoconus**

A 2010 study was identified on computer-assisted corneal topography for the design of gas-permeable contact lens in 30 patients with keratoconus who were recruited for the study in 2005 to 2006.(3) The report indicates 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 the comparison between the new computer-designed lens and the patient's habitual lens. This study has substantial limitations in both design and reporting.

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

In 2012, Lee et al reported a prospective comparative study of 6 methods of measuring corneal astigmatism for the purpose of toric intraocular lens implantation.(4) 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). All measurements were masked to the results for the other instruments. The study found no significant difference between the different instruments, indicating no advantage to computerized corneal topography compared with manual keratometry.

## **Summary**

With the exception of refractive surgery, a service not generally covered as a health insurance benefit, no studies have shown clinical benefit (eg, a change in treatment decisions) from a quantitative rather than qualitative evaluation of corneal topography. Therefore, due to the additional cost of this procedure and a lack of scientific evidence from appropriately constructed clinical trials that confirm improved health outcomes, quantitative evaluation of corneal topography, including evaluation with computer assistance, is considered not medically necessary.

## **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.(5) 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.

### **Medicare National Coverage**

There is no national coverage determination (NCD). In the absence of an NCD, coverage decisions are left to the discretion of local Medicare carriers.

### **References**

1. Morrow GL, Stein RM. Evaluation of corneal topography: past, present and future trends. Can J Ophthalmol 1992; 27(5):213–25.
2. Wilson SE, Klyce SD. Advances in the analysis of corneal topography. Surv Ophthalmol 1991; 35(4-Jan):269–77.
3. Bhatoa NS, Hau S, Ehrlich DP. A comparison of a topography-based rigid gas permeable contact lens design with a conventionally fitted lens in patients with keratoconus. Cont Lens Anterior Eye 2010; 33(3):128-35.
4. Lee H, Chung JL, Kim EK et al. Univariate and bivariate polar value analysis of corneal astigmatism measurements obtained with 6 instruments. J Cataract Refract Surg 2012; 38(9):1608-15.
5. Ophthalmic Technology Assessment Committee Cornea Panel American Academy of Ophthalmology. Corneal topography. Ophthalmology 1999; 106(8-Jan):1628-38.

### **Billing Coding/Physician Documentation Information**

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

Non-computer-assisted corneal topography is considered part of the evaluation/and management services of general ophthalmologic services (CPT codes 92002–92014), and therefore this service should not be billed separately.

### **Additional Policy Key Words**

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N/A

### **Policy Implementation/Update Information**

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- 10/1/00 New policy added to the Medical section. Considered inclusive to the E/M service.
- 10/1/01 No policy statement changes.
- 10/1/02 No policy statement changes.
- 10/1/03 No policy statement changes.
- 10/1/04 No policy statement changes. Added S-code.
- 10/1/05 No policy statement changes.
- 10/1/06 No policy statement changes.
- 10/1/07 Policy statement revision made and implemented on the date noted below.
- 5/1/08 Policy statement revised to include computerized corneal topography which is considered investigational. Non-computerized corneal topography remains a component of the evaluation/and management services of general ophthalmologic services.
- 10/1/08 No policy statement changes.
- 10/1/09 No policy statement changes.
- 11/1/09 Policy statement changed from investigational to not medically necessary. This change is effective 12/1/2009.

10/1/10    No policy statement changes.  
10/1/11    No policy statement changes.  
10/1/12    No policy statement changes.  
10/1/13    No policy statement changes.  
10/1/14    No policy statement changes.

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