

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

CLINICAL BENEFIT	<input type="checkbox"/> MINIMIZE SAFETY RISK OR CONCERN. <input type="checkbox"/> MINIMIZE HARMFUL OR INEFFECTIVE INTERVENTIONS. <input type="checkbox"/> ASSURE APPROPRIATE LEVEL OF CARE. <input type="checkbox"/> ASSURE APPROPRIATE DURATION OF SERVICE FOR INTERVENTIONS. <input checked="" type="checkbox"/> ASSURE THAT RECOMMENDED MEDICAL PREREQUISITES HAVE BEEN MET. <input type="checkbox"/> ASSURE APPROPRIATE SITE OF TREATMENT OR SERVICE.
Effective Date:	10/1/2024

[POLICY RATIONALE](#)
[DISCLAIMER](#)
[POLICY HISTORY](#)

[PRODUCT VARIATIONS](#)
[DEFINITIONS](#)
[CODING INFORMATION](#)

[DESCRIPTION/BACKGROUND](#)
[BENEFIT VARIATIONS](#)
[REFERENCES](#)

I. POLICY

Corneal Surgery

Corneal surgery for the correction of astigmatism resulting from trauma or from previous surgery (e.g., cataract, corneal) may be considered **medically necessary**. The astigmatism in the latter situation is considered a complication of the initial surgery.

Corneal surgery (i.e., epikeratoplasty) to correct aphakia may be considered **medically necessary**.

Intrastromal Corneal Ring Segments

Implantation of intrastromal corneal ring segments may be considered **medically necessary** for the treatment of keratoconus in patients 21 years of age or older who meet the following criteria:

- The patient has experienced a progressive deterioration in their vision, such that they can no longer achieve adequate functional vision with contact lenses or spectacles; **AND**
- Corneal transplantation is the only alternative to improve their functional vision; **AND**
- The patient has a clear central cornea with a corneal thickness of 450 microns or greater at the proposed incision site.

Intrastromal corneal ring implant (i.e., Intac Prescription Inserts) is considered **not medically necessary** as a treatment of myopia.

Intrastromal corneal ring segments are considered **investigational** for all other conditions, as there is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Corneal Topography/Computer-Assisted Corneal Topography and Photokeratoscopy

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOSCOPY
POLICY NUMBER	MP 1.044

Computer-assisted corneal topography is considered **medically necessary** for any of the following indications:

- Pre-operative evaluation for phototherapeutic keratectomy.
- Pre-operative evaluation for surgery to correct astigmatism resulting from trauma or from previous surgery
- Assessment of post-operative complications associated with post-traumatic corneal scarring or complications of a transplanted cornea
- Post-operative management of penetrating keratoplasty or cataract surgery
- Documenting visual complications resulting from trauma or from previous surgery.
- Evaluation of patients with unexplained visual loss
- Diagnosis and management of keratoconus, bullous keratopathy, or corneal dystrophy

Computer-assisted corneal topography is considered **investigational** for all other indications including when performed as part of pre-operative assessment of members with cataracts. There is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

Cross-references:

MP 2.028 Eye Care

MP 9.011 Corneal Transplant, Endothelial Keratoplasty, and Keratoprosthesis

MP 6.031 Gas Permeable Scleral Contact Lens and Therapeutic Soft Contact Lens

II. PRODUCT VARIATIONS

[TOP](#)

This policy is only applicable to certain programs and products administered by Capital Blue Cross and subject to benefit variations as discussed in Section VI. Please see additional information below.

FEP PPO – Refer to FEP Medical Policy Manual. The FEP Medical Policy manual can be found at: <https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies>.

III. DESCRIPTION/BACKGROUND

[TOP](#)

Corneal Surgery (Refractive Keratoplasty)

Refractive keratoplasty is a generic term that includes all surgical procedures on the cornea to improve vision by changing the refractive index of the corneal surface. Refractive keratoplasties include the following surgeries:

- Radial Keratotomy (RK) is a surgical correction for myopia (nearsightedness). Using a high-powered microscope, the physician places microincisions (usually eight or fewer) on the surface of the cornea in a pattern much like the spokes of a wheel. The

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

incisions are very precise in terms of depth, length, and arrangement. The microincisions allow the central cornea to flatten, thus reducing the convexity of the cornea, which produces an improvement in vision.

- Photorefractive Keratectomy (PRK) uses a computerized laser to correct myopia (nearsightedness). The excimer laser is utilized for cornea reshaping as it removes tiny amounts of tissue to produce the results needed to correct nearsightedness. The excimer laser produces a beam of ultraviolet light in pulses that last only a few billionths of a second. Each pulse removes a microscopic amount of tissue by evaporating it, producing very little heat, and usually leaving underlying tissue almost untouched. Overall, the surgery takes approximately 10–20 minutes; however, the use of the laser beam lasts only 15–40 seconds.
- Automated Lamellar Keratoplasty (ALK) can correct hyperopia. For the treatment of moderate farsightedness, the cornea is opened across the top to form a type of “cap,” using an automated instrument. When the “cap” is positioned back into its original location on top of the eye, microscopic scar tissue is formed, causing the “cap” to bulge out, thus correcting the overly flattened cornea that is associated with hyperopia. Almost like Velcro, the cornea and “cap” adhere to each other, eliminating the need for sutures. Normally, one eye is treated at a time, with about 3 to 4 weeks allowed between each eye surgery. To ease any discomfort, the eye is anesthetized with special drops, and the patient is given a mild sedative to remain relaxed and aware throughout the procedure.
- Minimally Invasive Radial Keratotomy (mini-RK) is intended in cases of myopia, to alter the cornea’s shape and consequently the refraction by reducing the millimeters of cornea that are incised.

All the above procedures can be used alone or in combination to produce the optimal result for a given patient.

- Keratomileusis involves removing, freezing, and lathing the patient’s cornea, followed by its replacement onto the corneal bed. This surgery has been proposed for myopia and aphakic hyperopia (aphakia is the absence of the lens of the eye).
- Keratophakia involves removing the patient’s cornea followed by placement of a lathed donor cornea beneath the recipient’s cornea, which is then reattached. This surgery has been proposed for aphakic hyperopia.
- Epikeratophakia (lamellar keratoplasty) involves suturing a pre-lathed donor cornea onto the surface of the recipient’s cornea. This surgery has been proposed as a means of correcting adult and pediatric aphakia, keratoconus (a conical protrusion of the cornea, caused by thinning of the stroma, and resulting in major changes in the refractive power of the eye), and myopia.

Implantation of Intrastromal Corneal Ring Segments

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOSCOPY
POLICY NUMBER	MP 1.044

Intrastromal corneal ring segments are composed of micro-thin, soft plastic inserts of variable thickness that are placed in the periphery of the cornea. They have been investigated as a means of improving vision in diseases such as keratoconus and pellucid marginal degeneration, and for astigmatism following penetrating keratoplasty.

Vision Disorders

Keratoconus is a progressive bilateral dystrophy characterized by paracentral steepening and stromal thinning that impairs visual acuity.

Pellucid marginal degeneration is a noninflammatory progressive degenerative disease, typically characterized by bilateral peripheral thinning (ectasia) of the inferior cornea.

Deterioration of functional vision results from the irregular astigmatism induced by asymmetric distortion of the cornea, and visual acuity typically cannot be restored by using spherocylindrical lenses.

Treatment

Initial treatment for keratoconus often consists of hard contact lenses. A penetrating keratoplasty (i.e., corneal grafting) was traditionally considered the next line of treatment in patients who developed intolerance to contact lenses. While visual acuity is typically improved with penetrating keratoplasty, perioperative complications are an associated risk; long-term topical steroid use is required; and endothelial cell loss occurs over time, which is a particular concern in younger patients. As an alternative, a variety of keratorefractive procedures have been attempted, broadly divided into subtractive and additive techniques. Subtractive techniques include photorefractive keratectomy or laser in situ keratomileusis (LASIK), although, generally, results of these techniques have been poor. In deep anterior lamellar keratoplasty, pathologic corneal stromal tissue is selectively removed to the level of the Descemet membrane, followed by transplantation of a donor graft. Implantation of intrastromal corneal ring segments (ICRS) represents an additive technique, in which the implants are intended to reinforce the cornea, prevent further deterioration, and potentially obviate the need for penetrating keratoplasty.

Rigid gas permeable contact lenses may be used to treat pellucid marginal degeneration. ICRS, crescentic lamellar keratoplasty, penetrating keratoplasty, and corneal wedge excision have also been proposed as treatments.

ICRS correct myopia by flattening the center of the cornea and represent an alternative to LASIK and other refractive surgeries. A proposed advantage of ICRS is that their insertion does not affect the central cornea and, thus, their effect is not related to the healing process in the cornea. No corneal tissue is removed, and the implants may be removed or replaced. However, mild myopia is effectively treated with spectacles or contact lenses.

Intrastromal Corneal Ring Segments

ICRS are composed of micro-thin, soft plastic inserts of variable thickness that are placed in the periphery of the cornea. They are inserted through an incision made in the cornea, into which channels have been created by rotating a lamellar dissector or by using a femtosecond laser. One or two segments are implanted in each channel, and various implants with a range of

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOSCOPY
POLICY NUMBER	MP 1.044

thicknesses are available for different degrees of correction. They affect refraction in the eye by physically changing the shape of the cornea (flattening the front of the eye), thereby correcting the irregular corneal shape and restoring a degree functional vision. If required, the implants can be removed or replaced.

Regulatory Status

Intacs®, an intrastromal corneal ring, was approved by the U.S. Food and Drug Administration (FDA) for two indications. In 1999, Intacs® (KeraVision, now Addition Technology) was approved by FDA through the premarket approval process for the following labeled indication:

“The KeraVision Intacs are intended for the reduction or elimination of mild myopia (-1.00 to -3.00 diopters spherical equivalent at the spectacle plane) in patients:

- Who are 21 years of age or older;
- With documented stability of refraction as demonstrated by a change of less than or equal to 0.50 diopter for at least 12 months prior to the preoperative examination; and
- Where the astigmatic component is +1.00 diopter or less.”

In 2004, Intacs® received additional approval by FDA through the humanitarian device exemption (HDE) process for the following indication:

“This device is indicated for the reduction or elimination of myopia and astigmatism in patients with keratoconus, who are no longer able to achieve adequate vision with their contact lenses or spectacles, so that their functional vision may be restored and the need for a corneal transplant procedure may potentially be deferred. The specific set of keratoconic patients proposed to be treated with Intacs prescription inserts are those patients:

- Who have experienced a progressive deterioration in their vision, such that they can no longer achieve adequate functional vision on a daily basis with their contact lenses or spectacles;
- Who are 21 years of age or older;
- Who have clear central corneas;
- Who have a corneal thickness of 450 microns or greater at the proposed incision site; AND
- Who have corneal transplantation as the only remaining option to improve their functional vision.”

Note: The HDE does not require manufacturers to provide data confirming the efficacy of a device but rather data supporting its “probable” benefit. The HDE process is available for devices treating conditions that affect fewer than 4000 Americans per year.

Intrastromal corneal ring devices available outside of the United States include:

- Intacs SK
- Ferrara intrastromal corneal ring segments

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOSCOPY
POLICY NUMBER	MP 1.044

- KeraRing intrastromal corneal ring segments
- MyoRing intracorneal continuous ring

FDA product code: LQE.

Corneal Topography/Computer-assisted corneal topography/Photokeratoscopy

Computer-assisted corneal topography (also called photokeratoscopy or videokeratography) provides a quantitative measure of corneal curvature. Corneal tomography (e.g. Scheimpflug or OCT) is the most commonly used modality to diagnose keratoconus due to its ability to detect posterior corneal elevation abnormalities even in mild or subclinical disease. Measurement of corneal topography is also being used 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.

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. 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 for measuring corneal curvature. This technique uses sophisticated

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

image analysis programs to provide quantitative corneal topographic data. Early computer-based programs were combined with keratometry 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 U.S. Food and Drug Administration (FDA) through the 510(k) process. In 1999, the Orbscan® (manufactured by Orbtex, 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.

IV. RATIONALE

[TOP](#)

Summary of Evidence

Intrastromal Corneal Ring Segments

For individuals who have keratoconus who receive ICRS, the evidence includes primarily single-institution case series. Relevant outcomes are change in disease status, functional outcomes, and treatment-related morbidity. A number of single-center case series with sample sizes ranging from 19 to 105 eyes have been published. These series have generally reported that a substantial proportion of patients with keratoconus treated with this device have improved vision at 1 to 2 years of follow-up. More limited data are available on long-term efficacy. ICRS is associated with a number of adverse events and explanation. Although, a single case series of 572 eyes have suggested that risk of explantation may be modest (6.1%). The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have pellucid marginal degeneration who receive ICRS, the evidence includes a few case series. Relevant outcomes are change in disease status, functional outcomes, and treatment-related morbidity. A small number of case series with fewer than 25 eyes per study have evaluated ICRS in patients with pellucid marginal degeneration. Most reports have assessed devices not available in the United States. In one study, which included some patients implanted with Intacs, there was no improvement in uncorrected visual acuity 6 months after surgery. Moreover, explantation occurred in about 20% of eyes due to visual deterioration. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have astigmatism after penetrating keratoplasty who receive ICRS, the evidence includes a few case series. Relevant outcomes are change in disease status, functional outcomes, and treatment-related morbidity. Two case series, with 9 and 54 patients, were identified: both used devices not available in the United States. ICRS was associated with

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

adverse events such as extrusion and Descemet membrane detachment. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Corneal Topography/Computer-Assisted Corneal Topography/Photokeratology

For individuals who have disorders of corneal topography who receive computer-assisted corneal topography/photokeratology, the evidence includes a single RCT and multiple nonrandomized 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 (e.g., 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.

V. DEFINITIONS

[TOP](#)

APHAKIA is an ophthalmologic condition in which all, or part of the crystalline lens is absent, usually because it has been surgically removed as in the treatment of cataracts.

CORNEA is the transparent anterior portion of the sclera (the fibrous outer layer of the eyeball), about one sixth of its surface: the first part of the eye that refracts light.

EXCIMER LASER is an ultraviolet laser used in refractive surgery to remove corneal tissue.

STROMA is the supporting tissue or matrix of an organ, the middle, thickest layer of tissue in the cornea.

VI. BENEFIT VARIATIONS

[TOP](#)

The existence of this medical policy does not mean that this service is a covered benefit under the member's health benefit plan. Benefit determinations should be based in all cases on the applicable health benefit plan language. Medical policies do not constitute a description of benefits. A member's health benefit plan governs which services are covered, which are excluded, which are subject to benefit limits, and which require preauthorization. There are different benefit plan designs in each product administered by Capital Blue Cross. Members and providers should consult the member's health benefit plan for information or contact Capital Blue Cross for benefit information.

VII. DISCLAIMER

[TOP](#)

Capital Blue Cross' medical policies are developed to assist in administering a member's benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOSCOPY
POLICY NUMBER	MP 1.044

policy and a member's benefit information, the benefit information will govern. If a provider or a member has a question concerning the application of this medical policy to a specific member's plan of benefits, please contact Capital Blue Cross' Provider Services or Member Services. Capital Blue Cross considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VIII. CODING INFORMATION

[TOP](#)

Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Not Covered:

Procedure Codes								
65760	65765	65771						

Covered when medically necessary:

Procedure Codes								
65400	65710	65730	65750	65755	65767	65772	65775	65781
65782	65785	92025	S0810					

Medically Necessary Diagnoses for Corneal Topography (CPT code 92025)

ICD-10-CM Diagnosis Codes	Description
A18.59	Other tuberculosis of eye
E36.8	Other intraoperative complications of endocrine system
H17.00	Adherent leukoma, unspecified eye
H17.01	Adherent leukoma, right eye
H17.02	Adherent leukoma, left eye
H17.03	Adherent leukoma, bilateral
H17.10	Central corneal opacity, unspecified eye
H17.11	Central corneal opacity, right eye
H17.12	Central corneal opacity, left eye
H17.13	Central corneal opacity, bilateral
H17.811	Minor opacity of cornea, right eye
H17.812	Minor opacity of cornea, left eye
H17.813	Minor opacity of cornea, bilateral
H17.819	Minor opacity of cornea, unspecified eye
H17.821	Peripheral opacity of cornea, right eye

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

ICD-10-CM Diagnosis Codes	Description
H17.822	Peripheral opacity of cornea, left eye
H17.823	Peripheral opacity of cornea, bilateral
H17.829	Peripheral opacity of cornea, unspecified eye
H17.89	Other corneal scars and opacities
H17.9	Unspecified corneal scar and opacity
H18.10	Bullous keratopathy, unspecified eye
H18.11	Bullous keratopathy, right eye
H18.12	Bullous keratopathy, left eye
H18.13	Bullous keratopathy, bilateral
H18.501	Unspecified hereditary corneal dystrophies, right eye
H18.502	Unspecified hereditary corneal dystrophies, left eye
H18.503	Unspecified hereditary corneal dystrophies, bilateral
H18.509	Unspecified hereditary corneal dystrophies, unspecified eye
H18.511	Endothelial corneal dystrophy, right eye
H18.512	Endothelial corneal dystrophy, left eye
H18.513	Endothelial corneal dystrophy, bilateral
H15.519	Endothelial corneal dystrophy, unspecified eye
H18.521	Epithelial (juvenile) corneal dystrophy, right eye
H18.522	Epithelial (juvenile) corneal dystrophy, left eye
H18.523	Epithelial (juvenile) corneal dystrophy, bilateral
H18.529	Epithelial (juvenile) corneal dystrophy, unspecified eye
H18.531	Granular corneal dystrophy, right eye
H18.532	Granular corneal dystrophy, left eye
H18.533	Granular corneal dystrophy, bilateral
H18.539	Granular corneal dystrophy, unspecified eye
H18.541	Lattice corneal dystrophy, right eye
H18.542	Lattice corneal dystrophy, left eye
H18.543	Lattice corneal dystrophy, bilateral
H18.549	Lattice corneal dystrophy, unspecified eye
H18.551	Macular corneal dystrophy, right eye
H18.552	Macular corneal dystrophy, left eye
H18.553	Macular corneal dystrophy, bilateral
H18.559	Macular corneal dystrophy, unspecified eye
H18.591	Other hereditary corneal dystrophies, right eye

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

ICD-10-CM Diagnosis Codes	Description
H18.592	Other hereditary corneal dystrophies, left eye
H18.593	Other hereditary corneal dystrophies, bilateral
H18.599	Other hereditary corneal dystrophies, unspecified eye
H18.601	Keratoconus, unspecified, right eye
H18.602	Keratoconus, unspecified, left eye
H18.603	Keratoconus, unspecified, bilateral
H18.609	Keratoconus, unspecified, unspecified eye
H18.611	Keratoconus, stable, right eye
H18.612	Keratoconus, stable, left eye
H18.613	Keratoconus, stable, bilateral
H18.619	Keratoconus, stable, unspecified eye
H18.621	Keratoconus, unstable, right eye
H18.622	Keratoconus, unstable, left eye
H18.623	Keratoconus, unstable, bilateral
H18.629	Keratoconus, unstable, unspecified eye
H18.711	Corneal ectasia, right eye
H18.712	Corneal ectasia, left eye
H18.713	Corneal ectasia, bilateral
H18.719	Corneal ectasia, unspecified eye
H18.899	Other specified disorders of cornea, unspecified eye
H18.9	Unspecified disorder of cornea
H27.00	Aphakia, unspecified eye
H27.01	Aphakia, right eye
H27.02	Aphakia, left eye
H27.03	Aphakia, bilateral
H52.201	Unspecified astigmatism, right eye
H52.202	Unspecified astigmatism, left eye
H52.203	Unspecified astigmatism, bilateral
H52.209	Unspecified astigmatism, unspecified eye
H52.211	Irregular astigmatism, right eye
H52.212	Irregular astigmatism, left eye
H52.213	Irregular astigmatism, bilateral
H52.219	Irregular astigmatism, unspecified eye
H52.221	Regular astigmatism, right eye

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

ICD-10-CM Diagnosis Codes	Description
H52.222	Regular astigmatism, left eye
H52.223	Regular astigmatism, bilateral
H52.229	Regular astigmatism, unspecified eye
L76.81	Other intraoperative complications of skin and subcutaneous tissue
L76.82	Other postprocedural complications of skin and subcutaneous tissue
Q12.3	Congenital aphakia
S05.00XA	Injury of conjunctiva and corneal abrasion without foreign body, unspecified eye, initial encounter
S05.00XD	Injury of conjunctiva and corneal abrasion without foreign body, unspecified eye, subsequent encounter
S05.00XS	Injury of conjunctiva and corneal abrasion without foreign body, unspecified eye, sequela
S05.01XA	Injury of conjunctiva and corneal abrasion without foreign body, right eye, initial encounter
S05.01XD	Injury of conjunctiva and corneal abrasion without foreign body, right eye, subsequent encounter
S05.01XS	Injury of conjunctiva and corneal abrasion without foreign body, right eye, sequela
S05.02XA	Injury of conjunctiva and corneal abrasion without foreign body, left eye, initial encounter
S05.02XD	Injury of conjunctiva and corneal abrasion without foreign body, left eye, subsequent encounter
S05.02XS	Injury of conjunctiva and corneal abrasion without foreign body, left eye, sequela
S05.8X1A	Other injuries of right eye and orbit, initial encounter
S05.8X1D	Other injuries of right eye and orbit, subsequent encounter
S05.8X1S	Other injuries of right eye and orbit, sequela
S05.8X2A	Other injuries of left eye and orbit, initial encounter
S05.8X2D	Other injuries of left eye and orbit, subsequent encounter
S05.8X2S	Other injuries of left right eye and orbit, sequela
T81.31XA	Disruption of external operation (surgical) wound, not elsewhere classified, initial encounter
T81.31XD	Disruption of external operation (surgical) wound, not elsewhere classified, subsequent encounter
T81.31XS	Disruption of external operation (surgical) wound, not elsewhere classified, sequela
T81.49XA	Infection following a procedure, other surgical site, initial encounter
T81.49XD	Infection following a procedure, other surgical site, subsequent encounter
T81.49XS	Infection following a procedure, other surgical site, sequela

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

ICD-10-CM Diagnosis Codes	Description
T81.89XA	Other complications of procedures, not elsewhere classified, initial encounter
T81.89XD	Other complications of procedures, not elsewhere classified, subsequent encounter
T86.840	Corneal transplant rejection
T86.841	Corneal transplant failure
T86.842	Corneal transplant infection
T86.848	Other complications of corneal transplant
T86.849	Unspecified complication of corneal transplant
Z94.7	Corneal transplant status

IX. REFERENCES

[TOP](#)

Corneal Surgery

1. TEC Assessment 1988, pp. 14, 169, 177, 197
2. TEC Assessment 1986, p. 97
3. American Academy of Ophthalmology Quality of Care Secretariat, Hoskins Center for Quality Eye Care Summary Recommendations for Keratorefractive Laser Surgery - updated June 2013

Implantation of Intrastromal Corneal Ring Segments

1. Zadnik K, Money S, Lindsley K. Intrastromal corneal ring segments for treating keratoconus. *Cochrane Database Syst Rev.* 2019 May; 5:CD011150. PMID 31087649
2. Vega-Estrada A, Alio JL, Brenner LF, et al. Outcomes of intrastromal corneal ring segments for treatment of keratoconus: Five-year follow-up analysis. *J Cataract Refract Surg.* Aug 2013; 39(8):1234-1240. PMID 23747207
3. Alio JL, Shabayek MH, Belda JI, et al. Analysis of results related to good and bad outcomes of Intacs implantation for keratoconus correction. *J Cataract Refract Surg.* May 2006; 32(5):756-761. PMID 16765791
4. Boxer Wachler BS, Christie JP, Chandra NS, et al. Intacs for keratoconus. *Ophthalmology.* May 2003; 110(5):1031-1040. PMID 12750109
5. Colin J. European clinical evaluation: use of Intacs for the treatment of keratoconus. *J Cataract Refract Surg.* May 2006; 32(5):747-755. PMID 16765790
6. Levinger S, Pokroy R. Keratoconus managed with intacs: one-year results. *Arch Ophthalmol.* Oct 2005; 123(10):1308-1314. PMID 16219721
7. Siganos CS, Kymionis GD, Kartakis N, et al. Management of keratoconus with Intacs. *Am J Ophthalmol.* Jan 2003; 135(1):64-70. PMID 12504699
8. Ziaei M, Barsam A, Shamie N, et al. Reshaping procedures for the surgical management of corneal ectasia. *J Cataract Refract Surg.* Apr 2015; 41(4):842-872. PMID 25840308

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

9. Beniz LA, Queiroz GH, Queiroz CF, et al. Intrastromal corneal ring segments delay corneal grafting in patients with keratoconus. *Arq Bras Oftalmol.* Feb 2016; 79(1):30-32. PMID 26840163
10. Heikal MA, Abdelshafy M, Soliman TT, et al. Refractive and visual outcomes after Keraring intrastromal corneal ring segment implantation for keratoconus assisted by femtosecond laser at 6 months follow-up. *Clin Ophthalmol.* Jan 2017; 11:81-86. PMID 28096650
11. Miraftab M, Hashemi H, Hafezi F, et al. Mid-term results of a single intrastromal corneal ring segment for mild to moderate progressive keratoconus. *Cornea.* May 2017; 36(5):530-534. PMID 27984365
12. Colin J, Malet FJ. Intacs for the correction of keratoconus: two-year follow-up. *J Cataract Refract Surg.* Jan 2007; 33(1):69-74. PMID 17189796
13. Bedi R, Touboul D, Pinsard L, et al. Refractive and topographic stability of Intacs in eyes with progressive keratoconus: five-year follow-up. *J Refract Surg.* Jun 2012; 28(6):392-396. PMID 22589292
14. Kymionis GD, Siganos CS, Tsiklis NS, et al. Long-term follow-up of Intacs in keratoconus. *Am J Ophthalmol.* Feb 2007; 143(2):236-244. PMID 17184717
15. Fernandez-Vega Cueto L, Lisa C, Poo-Lopez A, et al. Intrastromal corneal ring segment implantation in 409 paracentral keratoconic eyes. *Cornea.* Nov 2016; 35(11):1421-1426. PMID 27490048
16. Izquierdo L, Mannis MJ, Mejias Smith JA, et al. Effectiveness of Intrastromal Corneal Ring Implantation in the Treatment of Adult Patients With Keratoconus: A Systematic Review. *J Refract Surg.* 2019 Mar; 35(3). PMID 30855097
17. Kang MJ, Byun YS, Yoo YS, et al. Long-term outcome of intrastromal corneal ring segments in keratoconus: Five-year follow up. *Sci Rep.* 2019 Jan; 9(1). PMID 30670787
18. Nguyen N, Gelles JD, Greenstein SA, et al. Incidence and associations of intracorneal ring segment explantation. *J Cataract Refract Surg.* 2019 Feb; 45(2). PMID 30509748
19. Pinero DP, Alio JL, Morbelli H, et al. Refractive and corneal aberrometric changes after intracorneal ring implantation in corneas with pellucid marginal degeneration. *Ophthalmology.* Sep 2009; 116(9):1656-1664. PMID 19643482
20. Kubaloglu A, Sari ES, Cinar Y, et al. A single 210-degree arc length intrastromal corneal ring implantation for the management of pellucid marginal corneal degeneration. *Am J Ophthalmol.* Aug 2010; 150(2):185-192 e181. PMID 20570241
21. Arriola-Villalobos P, Diaz-Valle D, Guell JL, et al. Intrastromal corneal ring segment implantation for high astigmatism after penetrating keratoplasty. *J Cataract Refract Surg.* Nov 2009; 35(11):1878-1884. PMID 19878819
22. Coscarelli S, Ferrara G, Alfonso JF, et al. Intrastromal corneal ring segment implantation to correct astigmatism after penetrating keratoplasty. *J Cataract Refract Surg.* Jun 2012; 38(6):1006-1013. PMID 22624900
23. Ferrer C, Alio JL, Montanes AU, et al. Causes of intrastromal corneal ring segment explantation: clinicopathologic correlation analysis. *J Cataract Refract Surg.* Jun 2010; 36(6):970-977. PMID 20494769
24. Kanellopoulos AJ, Pe LH, Perry HD, et al. Modified intracorneal ring segment implantations (INTACS) for the management of moderate to advanced keratoconus: efficacy and complications. *Cornea.* Jan 2006; 25(1):29-33. PMID 16331037

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

25. Samimi S, Leger F, Touboul D, et al. Histopathological findings after intracorneal ring segment implantation in keratoconic human corneas. *J Cataract Refract Surg.* Feb 2007; 33(2):247-253. PMID 17276265
26. National Institute for Health and Care Excellence (NICE). Corneal implants for keratoconus [IPG227]. 2007
27. Blue Cross Blue Shield Association Medical Policy Reference Manual. 9.03.14, - Implantation of Intrastromal Corneal Ring Segments. Archived May 2021

Corneal Topography/Computer Assisted Corneal Topography/Photokeratology

1. Morrow GL, Stein RM. Evaluation of corneal topography: past, present, and future trends. *Can J Ophthalmol.* Aug 1992; 27(5):213-225. PMID 1393805
2. Wilson SE, Klyce SD. Advances in the analysis of corneal topography. *Surv Ophthalmol.* Jan-Feb 1991; 35(4):269-277. PMID 2011820
3. Martinez-Abad A, Pinero DP, Ruiz-Fortes P, et al. Evaluation of the diagnostic ability of vector parameters characterizing the corneal astigmatism and regularity in clinical and subclinical keratoconus. *Cont Lens Anterior Eye.* Apr 2017; 40(2):88-96. PMID 27931882
4. Weber SL, Ambrosio R, Jr., Lipener C, et al. The use of ocular anatomical measurements using a rotating Scheimpflug camera to assist in the Esclera(R) scleral contact lens fitting process. *Cont Lens Anterior Eye.* Apr 2016; 39(2):148-153. PMID 26474924
5. 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.* Jun 2010; 33(3):128-135. PMID 20053579
6. DeNaeyer G, Sanders DR, Farajian TS. Surface coverage with single vs. multiple gaze surface topography to fit scleral lenses. *Cont Lens Anterior Eye.* Jun 2017; 40(3):162-169. PMID 28336224
7. Bandlitz S, Baumer J, Conrad U, et al. Scleral topography analysed by optical coherence tomography. *Cont Lens Anterior Eye.* Aug 2017; 40(4):242-247. PMID 28495356
8. 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.* Sep 2012; 38(9):1608-1615. PMID 22795977
9. de Sanctis U, Donna P, Penna RR, et al. Corneal astigmatism measurement by ray tracing versus anterior surface-based keratometry in candidates for toric intraocular lens implantation. *Am J Ophthalmol.* May 2017; 177:1-8. PMID 28185842
10. Ophthalmic Technology Assessment Committee Cornea Panel American Academy of Ophthalmology. Corneal topography. American Academy of Ophthalmology. *Ophthalmology.* Aug 1999; 106(8):1628-1638. PMID 10442914
11. American Academy of Ophthalmology (AAO). Refractive Surgery Preferred Practice Pattern®. 2022.
12. Fan R, Chan TC, Prakash G, Jhanji V. Applications of corneal topography and tomography: a review. *Clin Exp Ophthalmol.* 2018; 46(2):133-146. doi:10.1111/ceo.13136. PMID 29266624

MEDICAL POLICY

POLICY TITLE	CORNEAL SURGERY, IMPLANTATION OF INTRASTROMAL CORNEAL RING SEGMENT AND CORNEAL TOPOGRAPHY/ PHOTOKERATOLOGY
POLICY NUMBER	MP 1.044

13. Lambert SR, Kraker RT, Pineles SL, et al. Contact Lens Correction of Aphakia in Children: A Report by the American Academy of Ophthalmology. *Ophthalmology*. 2018;125(9):1452-1458. doi:10.1016/j.ophtha.2018.03.014
14. Blue Cross Blue Shield Association Medical Policy Reference Manual. 9.03.05, Corneal Topography/Computer-Assisted Corneal Topography/ Photokeratology. Archived May 2024.

Other sources:

Mosby's Medical, Nursing & Allied Health Medical Dictionary, 6th edition.

X. POLICY HISTORY

[TOP](#)

MP 1.044	02/17/2020 Consensus Review. Policy statement unchanged. References reviewed.
	09/02/2020 Administrative Update. ICD10 codes added, H18.501, H18.502, H18.503, H18.509, H18.511, H18.512, H18.513, H18.519, H18.521, H18.522, H18.523, H18.529, H18.531, H18.532, H18.533, H18.529, H18.541, H18.542, H18.543, H18.549, H18.551, H18.552, H19.553, H18.559, H18.591, H18.592, H18.593, H18.599
	04/16/2021 Consensus Review. No change to policy statement. References reviewed and updated. No coding changes.
	06/10/2022 Consensus Review. Policy statements unchanged. FEP language revised. References updated.
	05/02/2023 Consensus Review. No change to policy statement. Background, Rationale and References updated. Removed outdated ICD10 codes H18.50, H18.51, H18.52, H18.53, H18.54, H18.55, H18.59.
	05/15/2024 Consensus Review. No change to policy statement. Background, references updated. Added ICD10 codes H18.711- H18.719, and S05.00XA-S05.02XS to list of covered diagnoses.

[TOP](#)

Health care benefit programs issued or administered by Capital Blue Cross and/or its subsidiaries, Capital Advantage Insurance Company®, Capital Advantage Assurance Company®, and Keystone Health Plan® Central. Independent licensees of the Blue Cross BlueShield Association. Communications issued by Capital Blue Cross in its capacity as administrator of programs and provider relations for all companies.