A separate copy of this form must accompany each policy submitted for review. Policies submitted without this form will not be considered for review.

<table>
<thead>
<tr>
<th>Plan: Aetna Better Health</th>
<th>Submission Date: 11/01/2018</th>
</tr>
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<tbody>
<tr>
<td>Policy Number: 0681</td>
<td>Effective Date:</td>
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<tr>
<td></td>
<td>Revision Date:</td>
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<tr>
<td>Policy Name: Corneal Pachymetry</td>
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</tbody>
</table>

Type of Submission – Check all that apply:
- ☑ New Policy*
- ☐ Revised Policy
- ☐ Annual Review – No Revisions

*All revisions to the policy must be highlighted using track changes throughout the document. Please provide any clarifying information for the policy below:

CPB 0681 Corneal Pachymetry

Policy is new to Aetna Better Health of Pennsylvania.

Name of Authorized Individual (Please type or print): Dr. Bernard Lewin, M.D.

Signature of Authorized Individual: [Signature]
I. Aetna considers ultrasound corneal pachymetry medically necessary for the following indications:

A. Bullous keratopathy; or
B. Corneal edema; or
C. Corneal refractive surgery (pre- and post-operative evaluation); or
D. Corneal transplant (penetrating keratoplasty) (pre- and post-operative evaluation); or
E. Evaluation of complications of corneal refractive surgery (once); or
F. Evaluation of corneal rejection post penetrating keratoplasty; or
G. Fuchs’ endothelial dystrophy; or
H. Persons with glaucoma or glaucoma suspects (testing is considered medically necessary once per lifetime); or
I. Posterior polymorphous dystrophy
Aetna considers repeat ultrasound corneal pachymetry for corneal diseases and injuries (indications D through I) not medically necessary if performed more frequently than once every 6 months.

II. Aetna considers corneal pachymetry to be of no proven value in the work-up of persons prior to cataract surgery unless corneal disease is documented. See CPB 0508 - Cataract Removal Surgery.

III. Aetna considers corneal pachymetry experimental and investigational for the following indications (not an all-inclusive list) because its effectiveness for these indications has not been established.

- As a screening test for glaucoma for persons without signs or symptoms of glaucoma or elevated intraocular pressure
- Diagnosis of Marfan syndrome
- Diagnosis or monitoring of Terrien's corneal marginal degeneration
- Evaluation of persons with keratoconus
- Monitoring of persons on hydroxychloroquine (Plaquenil)

*Note: Most Aetna benefit plans exclude coverage of refractive surgery. Please check benefit plan descriptions for details. Corneal pachymetry for evaluation of persons undergoing corneal refractive surgery is excluded from coverage under plans with these provisions.

Note: For purposes of this policy, only the ultrasound method of corneal pachymetry is considered.

Background
Corneal pachymetry is a non-invasive ultrasonic technique for measuring corneal thickness, and has been used primarily in the evaluation of persons with corneal diseases and in the assessment of persons at risk for glaucoma. Ultrasonic corneal pachymetry is performed by placing an ultrasonic probe on the central cornea, after the cornea has been anesthetized with a topical anesthetic. A technician can operate the pachymeter and it normally takes less than 30 seconds per eye to complete measurements.

The Ocular Hypertension Treatment Study (Kass et al, 2002; Gordon et al, 2002), a prospective randomized controlled clinical trial of glaucoma treatment in persons with elevated intra-ocular pressure (IOP) greater than or equal to 24 mm Hg, found central corneal thickness a statistically significant predictor of development of glaucoma. Corneal thickness was measured only after the study was initiated, and was not used to guide therapy. For the enrolled patients, the Ocular Hypertension Treatment Study results identified central corneal thickness less than 556 microns and a vertical or horizontal cup to disc ratio greater than 0.4 (vertical or horizontal) as risk factors for glaucomatous damage.

The Ocular Hypertension Treatment Study (Kass et al, 2002; Gordon et al, 2002) results suggested that IOP measurements need to be adjusted for abnormally thick or thin corneas. The target IOP is lower for a thin cornea and higher for a thick cornea. Eyes with thick corneas have a true IOP that is lower than the measured IOP. Conversely, eyes with thin corneas have a true IOP that is greater than the measured IOP. Thus, individuals with thicker corneas may be mis-classified as having ocular hypertension.

The Ocular Hypertension Treatment Study is the first to establish corneal thickness as a risk factor for glaucoma. However, the conclusions of OHTS are limited to persons with ocular hypertension (greater than 24 mm Hg), and do not establish the value of corneal pachymetry for screening.
persons without ocular hypertension. In addition, there are no prospective clinical outcome studies demonstrating the clinical utility of corneal pachymetry in selecting patients for therapy, for guiding therapy and improving clinical outcomes.

Based on the results of this study, the American Academy of Ophthalmology Preferred Practice Pattern on Evaluation of the Glaucoma Suspect (2005) recommended measurement of corneal thickness with electronic pachymetry in evaluating the glaucoma suspect.

Repeat measurements of corneal thickness for glaucoma are not necessary unless the patient has corneal diseases or surgery affecting corneal thickness. Changes in corneal thickness with age are minimal in adulthood, with estimated changes of 0.006 to 0.015 mm per decade (Doughty and Zaman, 2000).

Corneal pachymetry may be useful in assessing candidates for penetrating keratoplasty (corneal transplant), and assessing graft failure and the need for regrafting in corneal transplant recipients by aiding in the early diagnosis and treatment of graft rejection. Corneal pachymetry may also be useful in assessing the response to treatment of corneal transplant rejection. Corneal pachymetry has also been used to assess progression of disease in patients with certain corneal dystrophies and degenerative diseases.

Although keratoconus is associated with corneal thinning, available evidence indicates that ultrasonic corneal pachymetry is not as accurate as videokeratography in diagnosing keratoconus. Rabinowitz et al (1998) compared the accuracy of ultrasonic pachymetry measurements and videokeratography-derived indices in distinguishing keratoconus patients from those with normal eyes. The investigators measured corneal thickness by ultrasonic pachymetry at the center and inferior margins of the pupil of 142 normal and 99 keratoconus patients. The corneal surface
The investigators reported that the range of corneal thickness in normal and keratoconic eyes overlapped considerably. The investigators reported that videokeratography indices provided a 97.5% correct classification rate and pachymetry data, an 86.0% rate (p < 0.01). The investigators concluded that keratoconus is more accurately distinguished from the normal population by videokeratography-derived indices than by ultrasonic pachymetry measurements. The investigators posited that this may be due to the large variation in corneal thickness in the normal population or the inability of ultrasonic pachymetry to accurately detect the location of corneal thinning in keratoconus by measuring standard points on the cornea. The investigators concluded that pachymetry should not be relied on to exclude or diagnose keratoconus because the false-negative and false-positive rates are unacceptably higher than those obtained by videokeratography.

Sultan and colleagues (2002) examined corneal thickness, curvature, and morphology with the Orbscan Topography System I in patients with Marfan syndrome (MFS) and studied MFS with in-vivo confocal microscopy. This prospective, clinical, comparative case series included 60 eyes of 31 patients with MFS and 32 eyes of 17 control subjects. First, biomicroscopic examination was conducted to search for ectopia lentis. Then, mean keratometry and ocular refractive power were calculated by the autokeratorefractometer. In each group, the Orbscan System I mean (and mean simulated) keratometry and pachymetric measurements (at the central location and at 8 mid-peripheral locations) were obtained and compared, and correlations were established. In-vivo confocal microscopy was performed to evaluate tissue morphology and Z-scan analysis of 14 thin MFS corneas compared with 14 control corneas. A significant decrease (ANOVA, p < 0.0001) of mean simulated keratometry measurement appeared in the MFS group (sim K, 40.8 +/- 1.4 D) compared with the control group (42.9 +/- 1.1 D). Pachymetry in the MFS group was significantly decreased (p <
0.0001) compared with that in the control group, in the center (respectively, 502 +/- 41.9 microm and 552 +/- 23.6 microm) and the 8 mid-peripheral locations. Ectopia lentis was highly linked with mean keratometry and pachymetry (p < 0.0001). Confocal microscopy performed on MFS-affected thin corneas confirmed the corneal thinning and showed an opaque stromal matrix, and Z-scan profiles were abnormal with increased stromal back scattering of light. The authors concluded that MFS is known to be associated with a flattened cornea. This study demonstrated an association with corneal thinning and described confocal microscopy findings in MFS. While the finding of this study that used the Orbscan System (a slit-scanning light method) is interesting, there is currently a lack of evidence to support the use of ultrasound pachymetry in the diagnosis of MFS.

CPT Codes / HCPCS Codes / ICD-10 Codes

Information in the [brackets] below has been added for clarification purposes. Codes requiring a 7th character are represented by "+":

<table>
<thead>
<tr>
<th>Code</th>
<th>Code Description</th>
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<tbody>
<tr>
<td>76514</td>
<td>Ophthalmic ultrasound, diagnostic; corneal pachymetry, unilateral or bilateral (determination of corneal thickness)</td>
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CPT codes not covered for indications listed in the CPB:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>66830 - 66984</td>
<td>Removal of cataract</td>
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</table>

Other CPT codes related to the CPB:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>65710 - 65775</td>
<td>Keratoplasty</td>
</tr>
<tr>
<td>65820</td>
<td>Goniotomy</td>
</tr>
<tr>
<td>92020</td>
<td>Gonioscopy (separate procedure)</td>
</tr>
</tbody>
</table>
### Code | Code Description
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92100 - 92130 | Serial tonometry and tonography

**Other HCPCS codes related to the CPB:**

- **G0117** | Glaucoma screening for high risk patients furnished by an optometrist or ophthalmologist
- **G0118** | Glaucoma screening for high risk patients furnished under the direct supervision of an optometrist or ophthalmologist
- **S0800** | Laser in situ keratomileusis (LASIK)
- **S0810** | Photorefractive keratectomy (PRK)
- **S0812** | Phototherapeutic keratectomy (PTK)

**ICD-10 codes covered if selection criteria are met:**

- **H18.10 - H18.239** | Corneal edema and bullous keratopathy
- **H18.51** | Endothelial corneal dystrophy [Fuchs' only]
- **H18.59** | Other hereditary corneal dystrophies [posterior polymorphous corneal dystrophy]
- **H40.001 - H40.33x4** | Glaucoma
- **H40.40x0 - H40.43x4** | Glaucoma secondary to eye inflammation
- **H47.231 - H47.239** | Glaucomatous optic atrophy [cupping]
- **Q15.0** | Congenital glaucoma [Buphthalmos]
- **T86.840** | Corneal transplant rejection

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>Z94.7</td>
<td>Corneal transplant status</td>
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<tr>
<td></td>
<td><strong>ICD-10 codes not covered for indications listed in the CPB</strong></td>
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<tr>
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<td>[not all-inclusive]:</td>
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<tr>
<td>B50.0 - B54</td>
<td>Malaria</td>
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<tr>
<td>H18.461 - H18.469</td>
<td>Peripheral corneal degeneration [Terrien's corneal marginal degeneration]</td>
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<tr>
<td>H18.601 - H18.629</td>
<td>Keratoconus</td>
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<td>H25.011 - H26.9</td>
<td>Age-related and other cataract</td>
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<td>H28</td>
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<td>M05.40 - M06.9</td>
<td>Rheumatoid arthritis [not covered for monitoring plaquenil]</td>
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<td>M32.0 - M32.0</td>
<td>Systemic lupus erythematosus (SLE) [not covered for monitoring plaquenil]</td>
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<td>Q12.0</td>
<td>Congenital cataract</td>
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<td>Q87.40 - Q87.43</td>
<td>Marfan's syndrome</td>
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<tr>
<td>T37.2x1+  - T37.2x4+</td>
<td>Poisoning by antimalarials and drugs acting on other blood protozoa</td>
</tr>
<tr>
<td>Z13.5</td>
<td>Encounter for screening for eye and ear disorders</td>
</tr>
</tbody>
</table>

The above policy is based on the following references:

http://aetnet.aetna.com/mpa/cpb/600_699/0681.html
1. American Academy of Ophthalmology
   Refractive Management/Intervention Panel. Refractive
   errors and refractive surgery. Preferred Practice
   Pattern. San Francisco, CA: American Academy of
2. Canadian Ophthalmological Society. Practice
   guidelines for refractive surgery. Policy Statements
   and Guidelines. Ottawa, ON: Canadian
   Ophthalmological Society; June 2000.
3. American Academy of Ophthalmology Glaucoma
   Panel. Primary open-angle glaucoma suspect.
   Preferred Practice Pattern. San Francisco, CA:
   Panel. Primary angle closure. Preferred Practice
   Pattern. San Francisco, CA: American Academy of
   Ophthalmology; 2005.
5. American Academy of Ophthalmology Glaucoma
   Panel. Primary open-angle glaucoma. Preferred
   Practice Pattern. San Francisco, CA: American Academy
6. Palmberg P. Answers from the ocular hypertension
   treatment study. Archiv Ophthalmol. 2002;120 (6):829-
   830.
7. Doughty MJ, Zaman ML. Human corneal thickness and
   its impact on intraocular pressure measures: A review
   and meta-analysis approach. Surv Ophthalmol.
8. Whitacre MM, Stein RA, Hassanein K. The effect of
   corneal thickness on applanation tonometry. Am J
9. Gordon MO, Beiser JA, Brandt JD, et al. The Ocular
   Hypertension Treatment Study: Baseline factors that
   predict the onset of primary open angle glaucoma.
    Hypertension Treatment Study: A randomized trial
    determines that topical ocular hypertensive
medication delays or prevents the onset of primary open-angle glaucoma. Archiv Ophthalmol. 2002;120 (6):701-713.


Jacobs DS. Open-angle glaucoma: Epidemiology, clinical presentation, and diagnosis. UpToDate [online serial], Waltham, MA: UpToDate; reviewed May 2016.
AETNA BETTER HEALTH® OF PENNSYLVANIA

Amendment to
Aetna Clinical Policy Bulletin Number: 0681 Corneal Pachymetry

There are no amendments for Medicaid.

www.aetnabetterhealth.com/pennsylvania new 11/01/2018