Taking Corneal Topography To Higher Dimensions

Experts discuss how the new code will affect reimbursements and how new technological advances will improve patient care.

BY DIANE DONOFRIO ANGELUCCI, CONTRIBUTING EDITOR

In January, the American Medical Association established a unique current procedural terminology (CPT) code — 92025 — for corneal topography. Previously, eyecare practices relied on the unlisted code 92499 for this test, and reimbursement ranged from $25 to $120. Under the new code, the national Medical Physician Fee Schedule allows reimbursement of $29.18, which may vary by area. Insurance carriers' rates also may differ.

Read on to learn more about how the new code and other developments in corneal topography may impact your practice and patient care.

Easier Coding

One physician in the Midwest believes the new code may facilitate the billing and coding process. "Now that we have an actual CPT code, tracking corneal topographies will be easier," says David R. Hardten, M.D., of Minnesota Eye Consultants and adjunct associate professor of ophthalmology at the University of Minnesota in Minneapolis. Dr. Hardten's practice has been billing for corneal topographies for several years, and most carriers in his area cover the procedure when it's used to diagnose irregular astigmatism associated with problems such as corneal transplants, pterygia and scars. They also cover preoperative corneal topography for procedures, such as phototherapeutic keratectomy (PTK) and suture removal after transplants. "Obviously, using a bona fide code instead of one of the miscellaneous diagnosis or procedure codes makes it easier to handle some of the new insurance plans," he says. However, Dr. Hardten doesn't anticipate the new code will change reimbursement levels in his practice.

For Jonathan B. Rubenstein, M.D., professor, Department of Ophthalmology, Rush University Medical Center, Chicago, "Topography is an essential part of our patient evaluations, both preoperatively and postoperatively," he says, "and it's nice to be able to get reimbursed for this test that we do on a regular basis."

Enhanced Patient Care

Although reimbursement levels and frequency vary with the new code from state to state, corneal topography remains instrumental for providing the best possible patient care. "The technology and capabilities of these machines have expanded tremendously, even in the past 10 years," says Albert S. Jun, M.D., Ph.D., assistant professor of ophthalmology, Cornea and Anterior Segment Service, Wilmer Eye Institute, Johns Hopkins Medical Institutions, Baltimore. "It's been revolutionary in terms of its value to anterior segment/cornea specialists."

Corneal topography offers detailed analysis of the curvature of the cornea and helps clinicians pinpoint the causes of vision problems that can't be attributed to other parts of the eye.

"Corneal topographers provide the most sensitive method for detecting irregular astigmatism that can compromise vision," says Stephen D. Klyce, Ph.D., professor of ophthalmology and anatomy/cell biology, Louisiana State University Health Sciences Center, New Orleans. "Further, the nature of the irregular component in corneal topography allows the clinician to determine the etiology."

Dr. Hardten uses corneal topography mostly for diagnosing, planning and managing treatment for corneal scars or other types of irregular astigmatism. "I also use it quite a bit when planning suture removal," he says. "There's good literature supporting the use of corneal topography for suture removal after corneal transplants so you can select which sutures to remove earlier than others and end up with less long-term corneal irregular astigmatism."

Corneal topography also can help clinicians deter-

mine if an irregularity will affect vision, Dr. Hardten added. "For example, with irregular astigmatism associated with pterygia, it sometimes can be difficult to decide when the pterygium is visually significant. Corneal topography helps you diagnose this," he says.

In addition, physicians can use corneal topography to diagnose early keratoconus and pellucid marginal degeneration, and document progression, Dr. Jun says.

The technology also is used before refractive surgery to detect changes in the cornea, which could contraindicate refractive surgery. For example, Dr. Jun says, steepness of the posterior cornea is believed to be a sign that ectasia could develop after LASIK surgery.

"Cataract surgeons often find corneal topography more accurate in determining the central corneal power than standard keratometry values, since keratometry can miss central corneal shape anomalies altogether," Dr. Klyce says. "Cataract surgeons also can use the axis of corneal astigmatism and its symmetry obtained with topography to plan the placement of the entry incision."

William B. Trattler, M.D., cornea specialist, Center for Excellence in Eye Care, Miami, estimates he uses corneal topography five times more than wave scans for various applications. For example, he uses corneal topography for patients considering presbyopia-correcting cataract surgery to determine if they're good candidates for the procedure.

In addition, clinicians can use the technology for fitting contact lenses. "Most topographers have robust contact lens fitting programs that are very helpful in managing patients with abnormally shaped corneas," Dr. Klyce says. "Using specially designed rigid contact lenses for transplant patients and patients with keratoconus, for example, can provide one of the best ways to bring back functional vision for these individuals."

Ongoing Progress

Since physicians use corneal topographers for various applications, efforts continue to optimize this technology. Dr. Klyce and colleagues developed recommendations for corneal topography use in their research, funded by the National Eye Institute, at Louisiana State University. "Many of the recommendations are seemingly simple concepts, yet they haven't been implemented on all topographers even though they're in the public domain," he says. "For example, the use of a contrasting color palette with a fixed scale is essential for correct interpretation of corneal topography."[1] It provides consistent topography maps, enabling clinicians to differentiate between normal and abnormal corneas, he says.

In addition, a number of advances have been

COMPANY	MODEL	PRICE	WARRANTY
Eyelogic/ CBD/Tomey	Eyelogic X2 Advanced Automated Refraction	please call	1 year parts/labor
Marco	EPIC	please call	1 year
Marco	TRS	please call	1 year
Marco	Evolution	please call	1 year
RH Burton Company	VELO Refraction System	$39,000	3 years
RH Burton Company	VELO Refraction System w/slit lamp	$45,000	3 years
RH Burton Company	VELO 8500	$12,950	3 years
Topcon Medical Systems	CV-5000 Refraction System	please call	1 year parts/labor
Topcon Medical Systems	BV-1000 Automated Subjective Refraction	please call	1 year parts/labor
Veatch Ophthalmic Instruments	DRS-3100 Digital Refraction System	please call	3 years
Veatch Ophthalmic Instruments	DRS-3100 Digital Refraction System w/Sirius Visual Acuity System	please call	3 years
Veatch Ophthalmic Instruments	DRS-3100 Lite Digital Refraction System	please call	3 years
Veatch Ophthalmic Instruments	DRS-3100 Lite Digital Refraction System w/Sirius Visual Acuity System	please call	3 years
Veatch Ophthalmic Instruments	Futura Digital Refraction System	please call	3 years

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developed that could make it worthwhile to upgrade your corneal topographer.

In the last few years, more topographers that look at elevation directly have become available, Dr. Hardten says. "Whenever you're planning a surgical procedure, in general you're removing tissue, as with PRK, LASIK or PTK. Because you're removing tissue, you're really affecting the elevation of the cornea, and that has a direct effect on curvature," he added.

Dr. Rubenstein says, "These new elevation mapping machines provide detailed information about the cornea beyond what you can get with regular Placido disk topography, which was the standard method previously. This new technology yields specific information about the elevation of the anterior surface of the cornea compared with the posterior surface and compares these elevations with the thickness of the cornea in all locations." This helps in preoperative screening and postoperative assessment of refractive surgery patients, he says.

Corneal topography also is useful in planning surgical procedures for patients who've had prior surgery. For instance, several topographers provide software that can be used to calculate intraocular lens power for cataract surgery patients whose corneal shape has been modified by refractive surgery, Dr. Jun says.

"There are now fairly sophisticated programs that can automatically interpret the topography through a classification scheme," Dr. Klyce says. This is an excellent way to learn topography, and it becomes an important piece of diagnostic information you can integrate into the other findings obtained in an anterior segment workup, he says.

According to Dr. Jun, some topographers also will enable you to take a picture of the eye, offering you photographic capability that you could potentially code as an additional procedure.

Shopping for Equipment

If you're thinking about upgrading your topography system, here's what you should consider. Dr. Trattler recommends you spend some time learning how corneal topographers work and what they can do for you. "Most doctors probably use only about 10% to 15% of the devices' capabilities because there are so many different subprograms and various ways to analyze the results," he says.

Because of their complexity, you should look for a unit that's easy to use. Dr. Hardten suggests trying various corneal topographers at a trade show. "Most doctors will depend on their technicians to perform topography in the office, but it's a good idea for the doctor to make sure the topographer will produce a high-quality image easily," Dr. Hardten says. In addition, Dr. Hardten suggests looking for a system

COMPANY	MODEL	PRICE	WARRANTY
Canon Medical Systems	R-F10 Full Autorefractor	please call	1 year; optional extended warranty avail.
Canon Medical Systems	RK-F1 Full-auto Ref-keratometer	please call	1 year; optional extended warranty avail.
Kowa Optimed Inc.	KW-2000	$13,995	1 year parts/labor
Marco	ARK-530A	please call	1 year
Marco	ARK-760A	please call	1 year
Marco	3D Wave	please call	1 year
Marco	Palm AR Handheld Autorefractor	please call	1 year
Marco	Palm ARK Handheld Autorefractor/Keratometer	please call	1 year
Marco	M3	please call	1 year
Mercoframes Optical Corp.	Potec PRK-5000	$6,995	2 years
Reichert Ophthalmic Instruments	RK600 Auto Refractor/ Keratometer	please call	1 year
RH Burton Company	VELO 20/10 Auto Refractor	$7,995	3 years; 30-day money back guarantee
RH Burton Company	VELO 20/10 Auto Refractor/ Keratometer	$9,995	3 years; 30-day money back guarantee
RH Burton Company	Burton BARK80 Auto Refractor/ Keratometer	$7,995	3 years; 30-day money back guarantee
Right Medical	Retinomax Handheld Autorefractor	please call	1 year
Right Medical	Retinomax K-Plus Handheld Autorefractor	please call	1 year
Right Medical	Speedy-1 Autorefractor	please call	1 year
Right Medical	Speedy-K Autorefractor	please call	1 year
Shin-Nippon	ACCUREF 8001	$6,995	1 year
Shin-Nippon	ACCUREF 9001	$8,595	1 year
Shin-Nippon	NVISION-K 5001	$7,995	1 year

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that's being used by a significant number of clinicians so you have colleagues to turn to for help in understanding the map interpretation.

Once you've purchased your new corneal topographer, Dr. Hardten suggests keeping your old system for at least 6 months to a year. "The maps on any system will look a little bit different from what you're used to on your old machine," he says. Therefore, it's helpful to use both machines as you're switching over.

Of course, you may decide you want to keep both of your systems. Dr. Hardten's practice uses a Placido disk system and an elevation system. "Having both of these types of machines available, especially in a location where you're doing a lot of refractive surgery, sometimes is helpful in sorting out unusual corneas when the maps on the machines look different," he says. For example, if a patient has a somewhat opaque corneal scar, a Placido reflection system may be more helpful than a slit system.

Dr. Trattler's practice uses both a slit lamp topographer and a Placido disk system. "We obtain all of the information we need with two devices, but some people may be able to get by with just one device," he says.

Sometimes, one device may be better than another in distinguishing corneal changes as in the case of corneal ectasias. Dr. Klyce believes the Placido disk system is most sensitive to curvature changes. "For clinicians who need to detect the earliest shape changes associated with the corneal ectasias, Placido imaging still holds the trump card," he says.

Bright Future

Several new diagnostic instruments are available for assessing the cornea, such as confocal microscopy and high-speed optical coherence tomography, Dr. Rubenstein says. "When all of these modalities are combined with the newer types of corneal topography, you have an even greater understanding of the shape and the anatomy of the cornea, knowledge that you can apply to your corneal treatment decisions," he says.

"It's a very exciting time in corneal research and corneal surgery because of all the new technical developments," Dr. Rubenstein adds. "Over the past 1 to 2 years, there's been a dramatic increase in the sophistication of these devices, which will lead to even more exciting advances in our understanding of the cornea and in corneal treatment. I believe we're in a renaissance period now as far as advances in diagnosis and treatment of corneal disease."

REFERENCE

1. Smolek MK, Klyce SD, Hovis JK. The universal standard scale: proposed improvements to the American National Standards Institute (ANSI) scale for corneal topography. *Ophthalmol.* 2002;109:361-369.

COMPANY	MODEL	PRICE	WARRANTY	STIMULUS
Carl Zeiss Meditec	Field Analyzer II Model 720	please call	1 year	Goldmann std. proj. size III only; Heijl-Krakau fixation monitor & video eye monitor
Carl Zeiss Meditec	Field Analyzer II Model 740	please call	1 year	Goldmann std. proj. size I, II, III, IV, V; Heijl-Krakau fixation monitor & video eye monitor; gaze tracking
Carl Zeiss Meditec	Field Analyzer II Model 745	please call	1 year	Goldmann std. proj. size I, II, III, IV, V; Heijl-Krakau fixation monitor & video eye monitor; gaze tracking
Carl Zeiss Meditec	Field Analyzer II Model 750	please call	1 year	Goldmann std. proj. size I, II, III, IV, V; Heijl-Krakau fixation monitor & video eye monitor; head tracking; vertex monitor; gaze tracking
Carl Zeiss Meditec	Glaucoma Progression Analysis (GPA)	please call	1 year	n/a
Carl Zeiss Meditec	FDT Visual Field Instrument w/Welch Allyn freq. doubling	please call	1 year	frequency doubled sinusoidal gratings (0.25 cpd; 25 Hz)
Carl Zeiss Meditec	Humphrey Matrix	please call	1 year	frequency doubled sinusoidal gratings
Carl Zeiss Meditec	GPA SITA SWAP	please call	1 year	blue light; Goldmann std. proj. size V stimulus
Haag-Streit USA	Octopus 101	$19,995	1 year parts/labor	Goldmann I–V; blue/yellow detection < 3 minutes per eye; 100% fixation control yields; no fixation losses on printouts
Haag-Streit USA	Octopus 301	$11,345	1 year parts/labor	Goldmann III & V; low vision; 100% fixation control yields; no fixation losses on printouts; operates in diffuse room lighting
Haag-Streit USA	Octopus 311	$13,845	1 year parts/labor	Goldmann III & IV; low vision; 100% fixation control yields; no fixation losses on printouts; operates in diffuse room lighting
Kowa Optimed Inc.	AP-5000C	$11,995	1 year parts/labor	Goldmann std. proj. size II-V, Heijl-Krakau Eye fixation monitor.
MSS/ Notal Vision	Foresee PHP	please call	1 year	Dot deviation signal flashed over macular loci
Oculus Inc.	Centerfield II	please call	1 year	Goldmann size II; Heijl-Krakau & central fixation; video eye monitor; static white-on-white & blue-on-yellow; auto kinetic

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