

# Corneal topographic astigmatism corresponds to manifest refractive cylinder

SAN FRANCISCO — Corneal topographic astigmatism correlates with manifest refractive cylinder at the corneal plane more closely than other metrics, according to a study presented here.

“When we tried to look at a better parameter for corneal astigmatism, we were comparing it to manifest refractive cylinder as being the standard,” **George Stamatelatos, BScOptom**, said at the American Society of Cataract and Refractive Surgery meeting. “We found corneal topographic astigmatism, or CorT as we termed it, to be significantly closer to the refractive cylinder than the other measures of corneal astigmatism.”

CorT yielded a lower standard deviation of ocular residual astigmatism (ORA) than simulated keratometry (simK), manual keratometry, corneal wavefront and paraxial curvature matching, he said.

“We were frustrated with the different measurements of corneal astigmatism that you can take with manual keratometry, corneal wavefront or simulated K — the variability that you can get not only in the magnitude, but also in the meridian,” Stamatelatos said.

The study was published in the *Journal of Cataract and Refractive Surgery* in 2012.

Stamatelatos spoke in place of lead author and OSN Refractive Surgery Board Member Noel A. Alpíns, MD.

**The difference in orientation between the corneal astigmatism as measured by simulated keratometry (simK) and refractive cylinder (R). The corneal topographic astigmatism (CorT) lines up closer to the refractive cylinder positive axis than simK.**

ments were analyzed.

“Most importantly, we found that the CorT magnitude itself was certainly more closely related to refractive cylinder,” he said. “So, we looked at the magnitude of the ORA, defined as the vectorial difference between the refractive cylinder at the

corneal plane and the corneal astigmatism. The smaller the ORA, the less the difference in magnitude and axis between [corneal topographic astigmatism

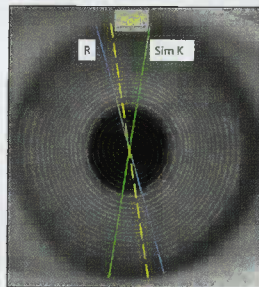


Image: Stamatelatos G

and manifest refractive cylinder]” – by **Matt Hasson**

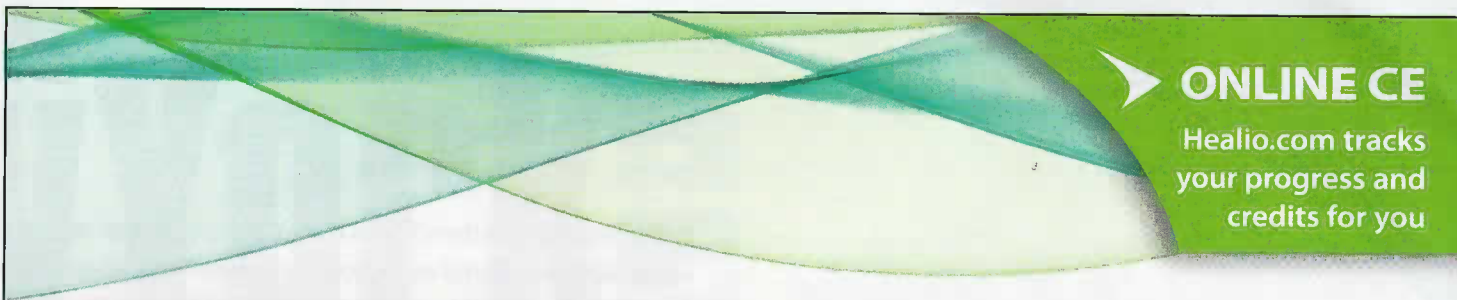


## Reference:

Alpíns N, et al. *J Cataract Refract Surg*. 2012;doi:10.1016/j.jcrs.2012.07.026.

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**Disclosure:** Stamatelatos and Noel A. Alpíns, MD, have a financial interest in the Assort outcomes analysis software.



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## Vector mean of Placido rings

The retrospective study included 486 right eyes and 485 left eyes of 498 patients. The Humphrey Atlas 9000 corneal topography system (Carl Zeiss Meditec) was used to measure corneal topography in all eyes.

A summated vector mean of Placido rings was used to derive a CorT value. Placido rings were compared to find the ring with the lowest standard deviation of ORA.

SimK typically looks at the seventh Placido ring, according to Stamatelatos.

“We said, ‘Why don’t we look at getting a lot more of the rings in there and do a summated vector mean of each of these rings once we determine the astigmatism from a best-fit spherocylinder on each of the rings?’” he said. “We determined the first 17 [rings] to be included in the study to best represent the measured cornea.”

## Wider corneal zone, ORA variation

SimK is based on data calculated from a narrow 3-mm zone of the cornea. CorT is derived from a wider region of the cornea and is more representative of the whole cornea and the manifest refractive cylinder, Stamatelatos said.

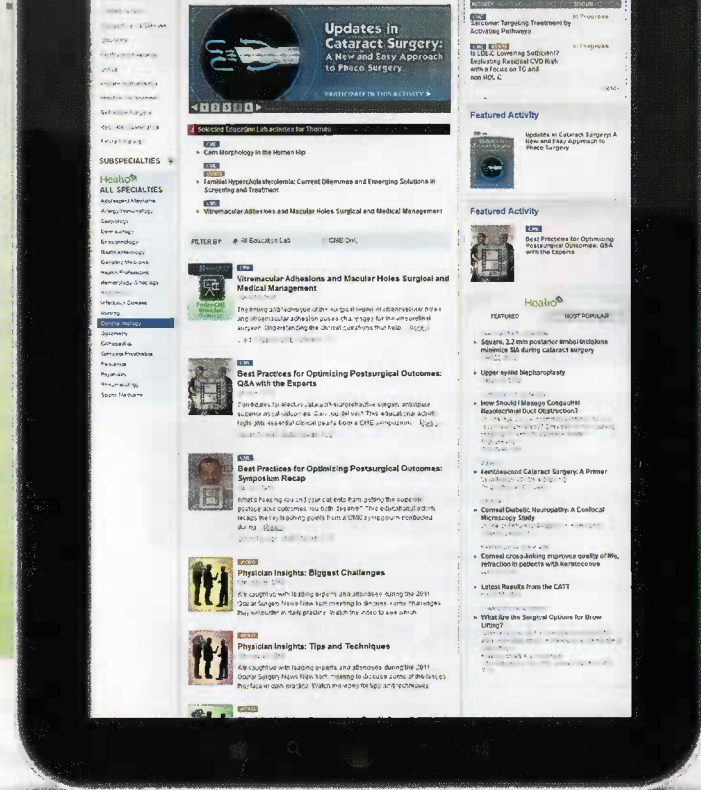
“SimK has been around for many years,” he said. “It looks at ... a restricted zone, about 3 mm of the cornea, depending on whether the cornea [is steep or flat].” Only anterior corneal measure-

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