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Next generation of laser eye surgery

Cornea 'fingerprint' means customized treatment, doctors say

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WASHINGTON (AP) -- Consider it an ocular fingerprint: A new generation of laser eye surgery is beginning that maps subtle irregularities in the cornea before it's zapped -- in hopes of crisper vision and fewer side effects.

Just how much better this new "wavefront-guided LASIK" works isn't proven yet, but it's causing excitement among eye surgeons who say the three-dimensional maps let them customize treatment in a way never before possible.

Still, it comes with an important consumer warning: This new surgery isn't risk-free, making it crucial to undergo proper exams to determine if you're a good candidate.

That includes a key measurement to be sure your cornea's thick enough to withstand zapping -- wavefront-guided LASIK can remove about 10 percent more tissue than regular LASIK does.

"This is a significant development that will allow us to have better outcomes than we have had in the past," says Dr. Doyle Stulting of Emory University, who oversees laser developments for the American Society for Cataract and Refractive Surgery.

But consumers must understand "there is never a 100 percent guarantee they'll get the perfect result," cautions Dr. Douglas Koch of Baylor College of Medicine, who helped test a wavefront system developed by Visx Inc.

Catching the wave

Americans undergo more than a million LASIK procedures a year, mostly to correct nearsightedness. Doctors use a laser to zap away tissue from the cornea, reshaping it for sharper sight.



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The vast majority of patients get better vision. But a small proportion -- nobody knows just how many -- suffer side effects, such as glare and other night-vision trouble, and painfully dry eyes. Some people can't see as well even with glasses or contact lenses after LASIK as they could before.

The new wavefront-guided LASIK can't help the dry-eye problem, but the hope is that it will lessen other side effects -- and perhaps help salvage vision in patients harmed by earlier conventional LASIK.

Regular LASIK is based on the person's glasses prescription.

Wavefront-guided LASIK adds a measurement of more subtle corneal distortions, called higher-order aberrations. Based on technology that helps astronomers see twinkling stars more clearly, they send waves of light into the eye and measure how they bounce back, forming a 3-D map of each person's unique wave patterns.

Higher-order aberrations can blur fine detail enough that someone whose quantity of vision measures a perfect 20/20 on an eye chart still has trouble driving, especially at night. LASIK itself can cause or worsen those distortions, essentially leaving a little ridge where the laser treatment ends.

But seeing the aberrations before surgery allows doctors to adjust, shaving off a little more tissue here and a little less there -- leaving a smoother surface and crisper vision, explains Dr. Stephen Brint of Tulane University, who helped test Alcon Laboratories' system.

Not everyone a candidate

The Food and Drug Administration recently approved both Alcon and Visx's wavefront-guided LASIK systems after studies showed about 80 percent of patients treated saw 20/20 without glasses. It adds \$350 to \$1,000 to LASIK's \$1,000- to \$2,000-per-eye cost.

"It is life-altering," says Beth Matthews of Gulfport, Mississippi, who had the surgery two weeks ago. "Can you tell I'm giddy?"

Her longtime eye doctor wouldn't let her have regular LASIK. Matthews had so many higher-order aberrations that, even with strong contact lenses, she squinted at road signs and could barely see at night through the glare. After wavefront-guided surgery, her vision measures a crisp 20/16 -- better than perfect, with no glare or squinting.

But wavefront-guided LASIK still causes new aberrations, just fewer of them, cautions FDA's Everette Beers.

And it doesn't eliminate the need for careful screening -- not everyone's a candidate, adds Ron Link, who runs a Web site, www.surgicaleyes.com, for LASIK-injured patients.

Take David Dutton of Canada. He can barely see out of his left eye at night after wavefront-guided LASIK in November, and suffers dry eyes so painful he must insert eyedrops in the middle of the night.

Dutton, a teacher in British Columbia, now knows he wasn't a good candidate for any type of LASIK. His corneas were so thin originally that surgery left less than the required 250 microns of thickness needed for good vision.

The public can check the latest LASIK guidelines at www.eyesurgeryeducation.org -- and check out the surgeon's track record.

"So much of the outcome has to do with patient selection ... and physician experience and competence," says FDA's Beers.

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