

Latest Advance in LASIK Eye Surgery Approved by the US Food and Drug Administration

FOR RELEASE 28TH MAY 2009

ST. LOUIS, MO — The US Food and Drug Administration recently approved a first of its kind technology for LASIK eye surgery, known as Advanced Control Eyetracking (ACE), for the Technolas LASIK platform. Eyetracking allows lasers used during LASIK surgery to compensate for eye movements during the procedure, thus adding an important level of assurance. However, no eyetracker has been able to adjust for subtle rotations of the eye that can occur *during* the laser treatment – that is until now. This new eyetracker locks on to the eye's unique iris pattern just before the laser treatment begins, and then monitors the pattern throughout the procedure. When rotation of the iris pattern is detected during the treatment the direction of laser pulses is nearly instantaneously adjusted accordingly. This ensures that each laser pulse of the LASIK treatment is delivered to its intended location on the cornea.

“Several published medical studies involving almost 2,000 LASIK cases clearly demonstrate the benefit of the comprehensive, active, rotational eye tracking afforded by ACE technology,” according to Dr. Scott MacRae, Professor of Ophthalmology at the University of Rochester in New York.(1-3) “This technology is one of a kind. Rotation of the eye during LASIK could result in less than full correction of astigmatism, which is very common among LASIK patients, and an increased chance of the need for a secondary enhancement procedure.”

Review of LASIK Technology Available Today

No other LASIK system available in the US can compensate for eye rotation during the LASIK treatment. Both the Technolas ACE and VISX S4 IR (Abbot Medical Optics, Santa Ana, CA) trackers compensate for the cyclorotation of the eye that can occur between the sitting position during critical diagnostic measurements and lying down on the LASIK bed. However, only the Technolas ACE tracker can adjust the delivery of laser pulses in response to eye rotation *during* the LASIK treatment. Further, the Technolas ACE system is enabled for both conventional and custom wavefront-guided LASIK treatments, while the VISX S4 IR tracker cannot adjust for cyclotorsion associated with conventional LASIK treatments.

The eyetrackers of the Wavelight and Ladarvision lasers (Alcon Laboratories, Fort Worth, TX) cannot compensate for eye rotation at all. The Wavelight system employs a four-point LED illumination pattern that the patient views, known as NeuroTrack™, which the company claims prevents any rotation during the procedure; however, no clinical data is available to confirm that this is indeed the case. In fact, a recent large study by Emory University using the Wavelight laser demonstrated that astigmatic eyes were nearly twice as likely as non-astigmatic eyes to require a touch up or enhancement procedure following LASIK. Increased enhancement rates among astigmatic eyes could be indicative of eye rotation during the treatment that goes unchecked.(4)

This new eyetracker also doubles the speed of tracking so as to allow the laser to rapidly adjust to the eye's movements; response time with ACE is now under 7 milliseconds, or 0.007 seconds. ACE also adjusts for the pupil center shifting that can occur between light and dark settings, critical to the proper centering of customized LASIK treatments over the pupil.

The first six US installations of ACE technology will be completed by mid-June. For a demonstration of how ACE works go to www.ready4lasik.com.

About Technolas Perfect Vision

Technolas Perfect Vision is a joint venture between Bausch & Lomb, the global eye health company, and 20/10 Perfect Vision AG, the femtosecond laser developer, that is focused on the laser vision correction industry. The new company combines the refractive eye surgery assets of both businesses, and will utilize its global service and support infrastructure to introduce new, laser-based vision correction procedures, especially focusing on treatments for presbyopia. FDA approval of its ACE eyetracker in May comes on the heels of receiving CE Mark in April to commercialize the company's INTRACOR procedure in Europe and elsewhere. INTRACOR represents a new femtosecond laser treatment for hyperopic (farsighted) presbyopes. Technolas Perfect Vision now markets product brands such as the INTRACOR femtosecond laser workstation with the CUSTOMFLAP, CUSTOMSHAPE and INTRACOR procedures, the TECHNOLAS 217z100 excimer laser system, which includes the ZYWAVE and ORBSCAN diagnostic devices, and the ZYOPTIX brand of laser vision correction treatments, as well as the HANSATOME and ZYOPTIX XP microkeratomes. For more information visit the company's website at www.technolaspv.com.

1. Neuhann IM, Lege BAM, Bauer M, et. al: Static and Dynamic Rotational Eye Tracking During LASIK Treatment of Myopic Astigmatism With the Zyoptix Laser Platform and Advanced Control Eye Tracker. J Refract Surg, 2009; in press.
2. Chang J: Cyclotorsion during laser in situ keratomileusis. J Cataract Refract Surg 2008; 34:1720–1726.
3. Ghosh S, Couper TA, Lamoureux E, et. al.: Evaluation of iris recognition system for wavefront-guided laser in situ keratomileusis for myopic astigmatism. J Cataract Refract Surg 2008; 34:215–221.
4. Randleman JB, White AJ, Lynn M, et. al.: Incidence, Outcomes, and Risk Factors for Retreatment After Wavefront-optimized Ablations with PRK and LASIK. J Refract Surg. 2009; 25:273-276.

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