

Improvements in Diagnostic Equipment for Cataract and Refractive Surgery

A selection of recent software upgrades that boost accuracy, functionality.

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In order for ophthalmic surgery to achieve optimal outcomes, treatments must be planned based on the best possible diagnostic inputs. For this reason, manufacturers of diagnostic equipment continually update their instruments and software to provide the most relevant and accurate information to the surgeon.

Recent improvements in ophthalmic diagnostic equipment for cataract and refractive surgeons include updated software for corneal topography, pachymetry, and surgical planning, and the addition of anterior-segment imaging capability to an established posterior-segment imaging device. This article reviews some of the latest improvements in ophthalmic diagnostic equipment for cataract and refractive surgery.

CA-200

Topcon Europe Medical BV (Capelle a/d IJse, Netherlands), introduced the Lentis Tplus toric IOL calculation software upgrade for its corneal analyzer, the CA-200, at the European Society of Cataract and Refractive Surgeons (ESCRS) meeting in Barcelona. According to company literature, the CA-200 is a Placido-disc-based topography system that consists of 24 rings on a 43.00 D cone and provides corneal coverage of 0.3 to 10.5 mm and a dioptric range of 1.00 to 120.00 D. The Lentis Tplus software calculates which toric IOL is best for your patient.



CIRRUS HD-OCT AND STRATUS OCT

Carl Zeiss Meditec (Jena, Germany) introduced an upgraded version of the Stratus OCT 6.0 software at the American Society of Cataract and Refractive Surgery (ASCRS) meeting in San Francisco in April 2009. This upgraded included enhanced repeat function, multi-slice reports, and anterior-segment imaging (not an approved indication in the United States).

The company also released new Cirrus HD-OCT 4.5 software at the American Academy of Ophthalmology (AAO) in San Francisco, providing enhanced high-definition scans that use Zeiss' proprietary Selective Pixel Profiling technique to extract clearer anatomical details from over-sampled images. The software is available for all Cirrus HD-OCT model 4000 systems.



EYE CUBED

Ellex Medical Lasers Ltd. (Adelaide, Australia) introduced the latest version of the Eye Cubed diagnostic ultrasound system at the AAO in San Francisco. According to the company, the upgraded software interface is more user-friendly and intuitive



to accelerate practice workflow. Features include improved data archiving and export capability, auto sequencing of scan labels, customized report capability, text annotations, and a multilingual user interface. Expanded measurement options include four sets of electronic distance measurement calipers and two sets of electronic angle measurement calipers, all with variable velocity.

GALILEI DOUBLE SCHEIMPFLUG ANALYZER

Zieler Group (Port, Switzerland) previewed the Galilei v5.2 software upgrade for its Galilei Double Scheimpflug Analyzer at the AAO in San Francisco. The Galilei v5.2 includes Zieler's proprietary Adaptive Numeric Interpolation for Surface Analysis (ANISA) algorithm. This algorithm delivers reliable data across larger corneal diameters, with the potential of more meaningful higher-order aberration data, improved keratoconus analysis, and better repeatability of cylinder values.



The newest software for the Galilei Double Scheimpflug Analyzer is capable of manually or automatically matching maps for comparison, according to the company. Before subtracting the two maps, they can be aligned with the pupil, the limbus, a best-fit-sphere on anterior height, or a multi-parameter auto-detect algorithm. The maps may be shifted or rotated relative to each other for optimal matching. Additionally, the Galilei graphical user interface has been modified to optimize ease of use. Users' capability to create and store customized reports and customized color scales has been further enhanced.

According to Zieler, the Galilei v5.2 software, which will be available in December, will be compatible with all Galilei systems that are currently running v4 or higher.

LENSTAR LS 900

The Lenstar LS 900 (Haag-Streit AG, Koeniz, Switzerland) is the first optical biometer to utilize optical low-coherence reflectometry (OLCR). It incorporates nine measurements into a single scan: pachymetry, keratometry, anterior chamber depth, lens thickness, axial length, white-to-white distance, pupillometry, eccentricity of the visual axis, and retinal thickness. According to the company, the Lenstar's interactive measurement guidance



allows paracentral measurement for improved cataract penetration. The unit is also capable of data communication with electronic medical record software and networks, and it has export functionality to external IOL calculation software. Haag-Streit USA (Mason, Ohio) recently received US Food and Drug Administration (FDA) clearance for the Lenstar LS 900 and introduced the device into the US market at the AAO annual meeting in San Francisco.

SCHWIND AMARIS

The Pachymetry Assisted Laser Keratoplasty Cam (PALK-Cam; Schwind eye-tech-solutions, Kleinostheim, Germany) module was recently added to the Schwind-Cam software suite.

The software is based on the PALK technique developed by Schwind in cooperation with Cesar Carriazo, MD, of Carriazo



Ophthalmological Center in Barranquilla, Colombia.

PALK-Cam, which is compatible with the Schwind Amaris laser, helps surgeons plan safe, precise corneal transplants. According to the company, the software determines the ablation volume of the host cornea based on a detailed pachymetry map, and the Schwind Amaris ablates the calculated volume. PALK is indicated for patients who need corneal transplants and whose endothelium is intact. Medical indications include keratoconus; scars due to bacterial infections, leukoma, or radial keratotomy; and other corneal diseases.

PALMSCAN AP2000

Two software upgrades are available for the PalmScan AP2000 (Micro Medical Devices, Inc., Calabasas, California), a battery-operated, pocket-sized A-scan and pachymeter combination device, according to the company. The PalmScan Femtosecond Laser software upgrade allows surgeons to measure corneal flap and corneal bed thickness simultaneously, without lifting the flap. The PalmScan Limbal Relaxing Incision (LRI) software calculates the LRI plan according to the Nichamin age- and pachymetry-adjusted (NAPA) nomogram as well as customized nomograms and displays graphical results. Additionally, the LRI software performs vector analysis of preoperative and cataract-incision-induced astigmatism. ■

