

ARVO Roundtable

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Fort Lauderdale, FL

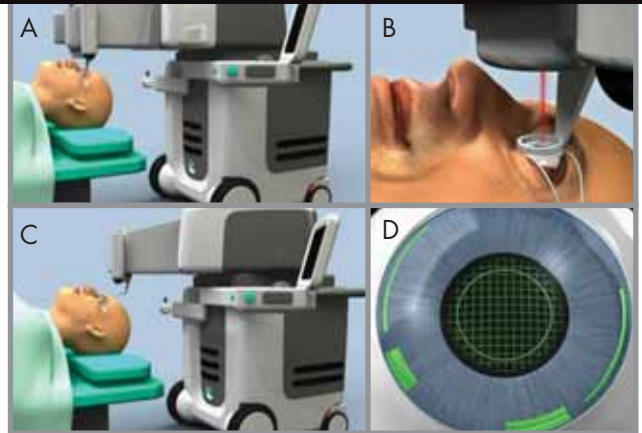
Cataract surgeons have experienced continued advances in technology and surgical technique over the past 2 decades. Refinements in phaco equipment technology have led to progressively smaller incisions, improved fluidics, greater efficiency in removing nuclear material, and a reduced risk of capsular breaks and other intraoperative complications. Even when surgeons use the latest technology, however, cataract procedures still do not deliver the precision and reproducibility achieved in refractive surgical procedures such as LASIK, and many practitioners believe such advances are not likely to come from improvements in phaco machines.

LASERS IN CATARACT SURGERY

"Today, the answer to greater precision and safety lies in the application of lasers to cataract surgical procedures," said William B. Trattler, MD, of Miami, while serving as the moderator of a discussion among refractive cataract surgeons during the 2010 ARVO meeting in Fort Lauderdale, Florida. "Laser-based cataract surgery represents game-changing technology that has the potential to radically transform the way we provide care to our patients."

Randy Frey, CEO of LensAR (Winter Park, FL), expanded on the LensAR short-pulse laser, which is reported to address potential sources of error in routine as well as complex cataract surgical procedures by using a laser for the operation's critical steps. "The LensAR laser system is designed to provide flexible, all-laser surgical options for corneal incisions, customizable capsulotomies, paracenteses, limbal relaxing incisions, and lens fragmentation—all in one procedure," he said. "Our approach is to bring the accuracy and precision of lasers into the operating room to replace blades and greatly reduce, if not eliminate, the need for ultrasound power to perform the majority of cataract removals."

To accomplish this ultimate goal of phacoless cataract surgery, the LensAR laser system utilizes proprietary 3D CSI (confocal structured illumination) technology that allows the system to see and precisely measure the length and density of ocular structures. The laser creates a precise 3D CSI map of the eye.



The arm of the LensAR short-pulse laser swings easily into the proper position (A). The femtosecond laser measures a patient's eye and makes the necessary cuts (B). The laser retracts (C). Capsulotomies, fragmentation, limbal relaxing incisions, and clear corneal incisions can all be performed (D).

The system remains active throughout the procedure and directs the laser when and where to shoot (and where not to). Recent iterations of the 3D CSI measurement system provide extremely clear images of the densest cataracts, grade 4 and even grade 5. The LensAR laser system recently received FDA 510(k) clearance to make capsulotomies, and the company will soon be filing its 510(k) for lens fragmentation.

Continued work on laser-based limbal relaxing incisions and corneal incisions is in progress, overseen by David F. Chang, MD, of Los Altos, California, who is the medical monitor for LensAR clinical studies. The LensAR laser system's design is also ergonomically efficient. "Given the potential to generate reproducible results in a highly efficient manner for our patients with standard cataracts, as well as in more complicated situations such as in eyes with pseudoexfoliation or loose zonules, I expect this technology will enable us to provide improved outcomes for our patients," said Dr. Trattler. *

Note: The LensAR Laser System is cleared by the FDA for anterior capsulotomy. For other indications, it is an investigational device limited by US law to investigational use only.