

Issue: March 2011

Spotlight ON TECHNOLOGY & TECHNIQUE

Accurate Readings Even for Dense Cataract

By Samantha Stahl, Assistant Editor

The bar for cataract patients' refractive outcome expectations is steadily rising—they want perfect vision, zero complications and to get in and out of the office as quickly as possible. Thanks to new technology upgrades to Carl Zeiss Meditec's popular IOLMaster biometer, ambitious wish lists like those are a little easier to tackle. The newest model, called the IOLMaster 500, streamlines the IOL selection process with features that efficiently take accurate eye measurements, according to the company.

“We should all seek out new ideas and technologies that will enable us to improve accuracy and precision to help us get closer to our refractive goal,” says Alice Epitropoulos, MD, of Columbus, Ohio, who uses the IOLMaster for her cataract cases. “Patients judge the quality of their surgery on their refractive outcomes and increased precision of axial length measurements increases the chances of an optimal outcome for our patients.”

Prompt Precision

One of the IOLMaster 500's chief benefits is its ability to take quick measurements, says Dr. Epitropoulos. The device—capable of taking axial length and keratometry calculations simultaneously—can produce measurements in as little as 80 seconds, according to the manufacturer. “With these faster measurements and better penetration through dense cataracts, the overall clinical workflow is more efficient,” she says. Even with challenging cases, the IOLMaster prides itself in obtaining accurate numbers.

As an example, Dr. Epitropoulos cites a high myope patient with a posterior staphyloma. “These patients often present a challenge to even experienced biometrists and can be very time consuming,” she says. Despite this condition, the patient was able to focus on the IOLMaster's small fixation light to confirm that the axial length measurement was at the fovea yielding the refractive, not anatomic axial length. Postoperatively, the patient ended up with his target refraction.

Composite Technology

As for the most beneficial feature of the IOLMaster, Dr. Epitropoulos points to the composite signal technology, saying that it significantly increases the fraction of measurable cataracts and raises the signal-to-noise ratio (SNR).

“One of the drawbacks to laser optical biometry has been the failure to achieve measurements in approximately 15% to 20% of eyes, usually due to dense cataracts. In

these cases, the SNR is too low, requiring ultrasound biometry to successfully measure an axial length,” she says.

IOLMaster 500 alleviates SNR problems by creating a composite signal. It takes multiple measurements, looks where the recurrent signal is, superimposes those images and constructively adds them after five measurements, she explains. This produces a higher SNR and more reliable axial length measurement. “The composite algorithm results in fewer failures in acquiring axial length measurements for patients with dense cataracts, which improves patient flow and efficiency,” says Dr. Epitropoulos.

The device provides feedback for technicians with a green-yellow-red traffic light system to let them know when accurate readings are being taken, she explains. In conjunction with the SNR analysis, “the software is able to automatically exclude bad readings and create a composite best measurement for each eye.” She found that patients measured with the IOLMaster were within a half-diopter of their intended refractive goal one month postop.



The IOLMaster 500 can take simultaneous axial length and keratometry calculations.

Dr. Epitropoulos notes that upgrading to the IOLMaster 500 will be an easy transition for those who have used previous models, but there is little learning curve regardless of prior biometer experience because of the composite technology. Since the system automatically calculates the quality and selection of the readings, the device is easy for technicians and physicians to use.

“It's comforting to know that the device internally validates these measurements,” says Dr. Epitropoulos. “The IOLMaster technology has enhanced overall quality of the

cataract surgery process and outcomes. It has greatly improved patient flow and efficiency with more precision, speed and convenience for me, my technicians and my patients.” OM

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