A New Generation of High-definition Ultrasound

The AVISO A/B from Quantel Medical provides accurate diagnoses — quickly and easily.

In many practices, the solution for high-frequency anterior and posterior segment imaging is the AVISO A/B (axial eye length measurement/B-scan) from Quantel Medical, Bozeman, Mont. It gives surgeons a clear view of the anterior chamber for precise measurements, which other systems can't accomplish. And for fast, new-generation biometry, the AVISO A/B's precision is clinically proven equivalent to laser interferometry.

The AVISO A/B has six formulas for IOL calculation in normal eyes and six formulas for "K Correction" to help surgeons meet the challenge of IOL calculation in post-refractive eyes. It also gives surgeons a robust and convenient set of functions. Its optional high-frequency probes further enhance the device's applications.

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"The AVISO A/B is precise, easy to use, and ergonomic," says Andrew Jefferson, M.D., a cataract surgeon at Discover Vision Center in Leawood, Kan., an associate clinical professor of ophthalmology at the University of Kansas and director of cataract and implant surgery at the Kansas City VA Hospital. "The wide range of IOL calculation formulas for both normal and post-refractive eyes should help anterior segment surgeons improve their outcomes. We're extremely pleased with the results."

Precise biometry

Physicians and staff at Discover Vision Center have been using the AVISO A/B with portable laptop and touch-screen for about 6 months. Like many ophthalmologists, the retina, cataract and refractive

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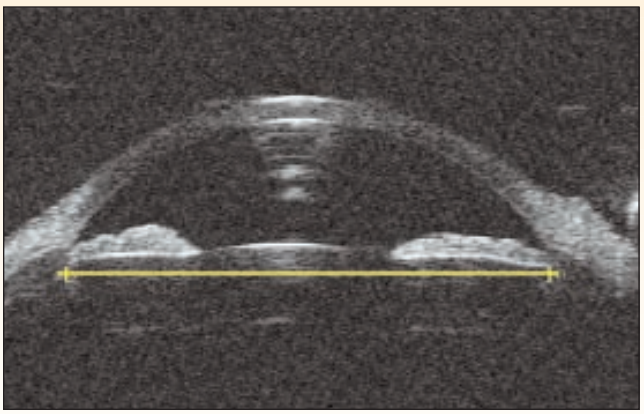
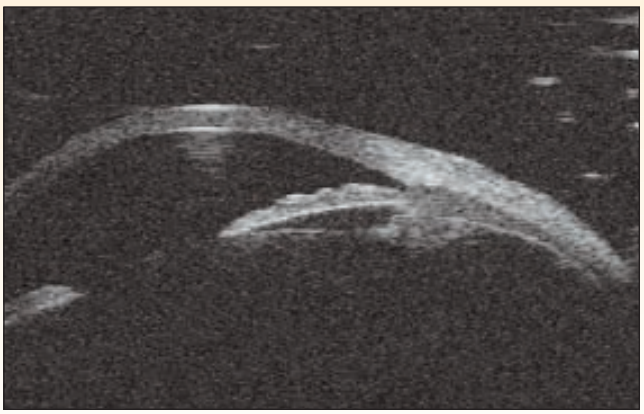
surgeons in this multispecialty group rely on the technology for essential diagnostic and preoperative data. The AVISO A/B is particularly useful when physicians can't use optical coherence tomography (OCT), or





Left: A sulcus-to-sulcus measurement using the LIN50 UBM Probe. Right: An angle measurement using the LIN50 UBM Probe.

when OCT isn't effective due to dense media.

"My primary candidates for the AVISO A/B are patients undergoing cataract surgery. We use the device for preoperative biometry," Dr. Jefferson says. "There's also a small group of patients who have mature cataracts that obscure any view of their retinas. The B-scan enables me to rule out entities such as choroidal tumors, vitreous hemorrhage and retinal detachment."

The AVISO A/B allows physicians to take up to 10 A-scans per eye using the immersion or contact technique. The software has built-in pattern recognition. It can adjust for eye types, such as phakic, dense cataract, aphakic and pseudophakic materials (PMMA, acrylic and silicone), as well as for specific eye segments (AC, lens, vitreous), which can be adjusted easily for issues such as silicone oil in the vitreous. The device automatically discriminates for a "scleral echo" after the retina spike. This feature automatically eliminates "optic nerve scans," a common biometry error, which can result in significant post-op surprises in patients presenting with advanced glaucoma.

B-scan applications

Timothy M. Stout, M.D., is a retinal specialist at Discover Vision Center. "As a vitreoretinal surgeon, I often have an obstructed view of a patient's retina," he explains. "There may be a vitreous hemorrhage or a dense cataract, or a patient may have a lesion on top of or below the retina. The AVISO A/B helps me to see the internal reflectivity of the lesion and measure these objects."

Using the B-scan function, operators can adjust the gain from 20 dB to 110 dB, the forward gain (TGC) from 0 dB to 30 dB and the adjustable dynamic from 25 dB to 90 dB. Physicians can take an unlimited number of measurements, using calipers and calculating areas and angles while recording markers and comments.

"The AVISO A/B is precise, easy to use and ergonomic. ... The six formulas have delivered very capable results."
— Andrew Jefferson, M.D.

Image quality and features

The AVISO A/B's exceptional image quality and flexibility, as well as the integrated advanced measuring tools, give physicians a distinct diagnostic advantage. "Image quality is excellent," Dr. Jefferson says. "Where this machine excels is its precision — its ability to get a reproducible axial length.

"Often, we'll do side-by-side comparisons with the IOLMaster and find that the AVISO

A-scans correspond extremely well. The AVISO is consistently accurate. We perform outcome analysis and find target variation — the difference between predicted spherical equivalent and actual spherical equivalent — to be minimal."

The AVISO A/B also offers a B-scan "cineloop" video sequence of up to 10 seconds (100 image frames). The image quality matches that of the still images, and they can be stored on the hard disk. Physicians can scroll back and forth, frame-by-frame, through the sequence to detect pathology, and then adjust the gain on a single frame.

"The cineloop is a great feature," Dr. Jefferson says. "The cineloop can clarify details that were difficult to see at first glance."

Dr. Stout agrees. "I think it's great. I love the quality of the video footage," he says. "It can be wonderful for educating patients and their families. We can show them video footage of the vitreous hemorrhage or retinal detachment. It helps them visualize what's happening."

Ease of use

The AVISO A/B's unique touch-screen remote control makes the examination fast and easy, and physicians can store patient data in the onboard database or send it to their intranet or electronic medical record (EMR) system. Practices can choose from a portable laptop format or a desktop system with a 20-inch, high-definition screen.

"It's very user-friendly," Dr. Stout says. "We use it on a Dell laptop with a wireless mouse and just point and click. And there's a separate touch-screen panel on the remote control module."

According to Dr. Jefferson, "The touch screen is simple, and the scan takes about 10 seconds. Because the machine has been designed so well and it's so easy to use, we can rely on the tests with confidence."

As for image printing and storage, Drs. Stout and Jefferson are pleased to use the AVISO A/B's convenient options in their practice. Both surgeons combine electronic labeling and notes with printing the images for notation in addition to patients' charts.

"I like the ease of printing multiple views on one standard-sized page instead of printing small separate images that we need to compare, and then staple to the chart," Dr. Stout says. "I also appreciate that the device's size makes it portable enough to transport to satellite offices."

Dr. Jefferson adds, "We don't have an EMR yet, but it's good to have the AVISO capability when we're ready to implement one."

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Advanced probes

As an option for the AVISO A/B, Quantel Medical offers high-frequency probes that enable physicians to perform both anterior and posterior segment imaging with advanced measurement tools. Of special interest to anterior segment and refractive surgeons is the special LIN50 UBM probe that enhances their ability to take precise measurements of anterior segment anatomy.

Michel G. Puech, M.D., of Paris, France, has been using the AVISO A/B with the LIN50 UBM probe for 8 months to examine patients referred for glaucoma (70%), refractive surgery (8%) and tumors (12%).

"The advantage of the AVISO with the LIN50 UBM probe is that it enables me to visualize the anterior segment with high-resolution imaging," Dr. Puech explains. "This is of critical importance when we compare the technology with ultrasound biomicroscopy (UBM). In refractive surgery, the high-resolution images allow me to make highly precise measurements of anterior segment distances — anterior chamber depth, angle-to-angle and sulcus-to-sulcus — to select phakic IOL candidates. In its glaucoma application, the high resolution images show us the angle and the scleral spur so we can quantify the angle opening."

Peter Good, M.D., of Sandwell and West Birmingham Hospital, U.K., agrees. He has been using the AVISO A/B with the LIN50 UBM probe for 6 months for patients with acute glaucoma, iris anomalies, corneal problems, anterior segment dysgenesis and sulcus lens implants, as well as for patients with pre-equatorial retinal problems. "I've

seen a great deal of improvement in my ability to obtain accurate sulcus-to-sulcus, AC depth, angle and corneal thickness measurements," Dr. Good observes.

Diagnostic capabilities

The LIN50 UBM probe helps physicians diagnose acute glaucoma, serving as a valuable adjunct to the chronic disease diagnostic abilities of OCT and HRT technologies. "The LIN50 is ideal for rapid diagnosis of acute glaucoma," Dr. Good says. "Because it's easier to use than conventional UBM, it's much quicker and easier to obtain a diagnosis for anterior segment pathology."

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"OCT and HRT use posterior pole imaging to detect early stages of glaucoma, and the LIN50 does not compete in this element, although it does help us image trabeculectomy or deep sclerectomy to check the results of filtering surgery for patients with early open-angle glaucoma," Dr. Puech says. "OCT Visante (Zeiss) gives images of the anterior segment, but LIN50 has better penetration behind the iris, with better visualization of the ciliary body. Being able to observe the anterior position of the ciliary processes is critically important in plateau iris cases."

Dr. Puech uses the LIN50 to perform a dynamic test of angle closure, observing the angle opening in light and dark to diagnose acute glaucoma risk. He points out that the probe has given him greater accuracy in diagnosing anterior segment pathology. "First, diagnosis is easier because the LIN50 UBM is a handheld probe, and we can choose the right position for scans," he says. "The zoom effect is particularly useful during examinations, and the 50 MHz probe offers higher resolution and accuracy than a 20 MHz probe. The LIN50 offers complete anterior segment scans with higher accuracy than UBM for select phakic IOL candidates."

Unique scanning design

The LIN50 UBM probe has a unique linear scanning design that differentiates it from other UBM probes. "The probe's scanning features are a great improvement on conventional sector probes," Dr. Good says. "It's not necessary to reconstruct the anterior chamber image; therefore, we get a very rapid view of the whole of the anterior segment. We can see the entire anterior segment in each scan, which aids diagnosis."

The probe's satisfying penetration depth affords physicians a detailed view of the ciliary process. According to Dr. Good, "The view offers much greater width and depth, compared to other devices. The penetration is very good, offering much clearer images of the ciliary body and the anterior areas of the posterior segment (pars plana and ora). I have used it for sulcus-to-sulcus and AC width measurements and have found it excellent."

Dr. Puech appreciates the LIN50's width of field for imaging large tumors, but he points out that dimensions aren't everything. "Compared to 10 MHz or 20 MHz probes, the LIN50 has larger dimensions, but its dimensions are smaller than the UBM," he says. "By using LIN50, we can move the probe very easily in all directions with unlimited angulation. In our hands, LIN50 is very easy to use."

Pleasing results

"We're really happy with the system's EMR-readiness, the ergonomics of the crisp screen and the total ease of use. What's more, the service and support have been excellent," Dr. Jefferson says. "But my main concern is outcomes. I'm very pleased to say that we're very satisfied with the results of our outcomes analysis." It gives crisp, clear anterior images, as well as accurate biometry and IOL calculation — all essential to the best possible outcomes for ophthalmic surgery.