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Immersion A-scan provides accurate biometry

Models such as Quantel's Axis II A-scan are suited to modern demands for emmetropia.

BOZEMAN, Mont. – Immersion A-scan devices, in conjunction with the Praeger shell, allow surgeons to achieve more accurate biometry in measuring axial length for IOL power selection than applanation A-scans.

One such device is the Axis II, made by Quantel Medical, based here.

"In our view it's the best machine on the market," said J. **Stuart Cumming, MD**, designer of the AT-45 accommodating IOL manufactured by C&C Vision, which is in preliminary clinical trials. Dr. Cumming said the immersion technique allows improved accuracy that will be vital for use with accommodating IOLs designed to leave patients free from glasses.

According to **Bill Menke** of Quantel, the Axis II offers three times more measuring points than other A-scans available, making it more precise. Another option that makes the Axis II different from other A-scans is that it offers specific pseudophakic velocities for each type of lens material, not just one general speed for all IOLs, he said.

Biometry

Most A-scans measure biometry using applanation. With patients demanding more accurate uncorrected post-cataract vision, some surgeons are beginning to feel that applanation is not accurate enough, Dr. Cumming said.

"Different formulas can tell you what lens power you can put in the eye to get emmetropia," he said. "Over the years those formulas were refined to make them more accurate, but when you get someone who is very myopic or very hyperopic then the formulas can become inaccurate. People started looking at the methods of doing the measurements and tried to modify the formulas. They realized the old method of applanation was not really accurate."

The Axis II allows surgeons to achieve accurate biometry using the immersion technique for measuring axial length in IOL power selection.

When ultrasound transducers are placed on the cornea, they cause a slight indentation. Even a slight shortening in the length of the eye can affect the visual outcome of surgery, according to Mr. Menke. An indention of 1 mm can cause up to 3 D of error, he said.

According to Dr. Cumming, the primary reason the Axis II A-scan is beneficial is that its immersion technique, using the Praeger shell, leads to better biometry and better uncorrected vision.

"You're measuring the length of the eye without having to touch it," Dr. Cumming said. "So you get very accurate results. With this technique you can measure and do the biometry quickly in any eye, no matter how dense the cataract, with the patient sitting up. It is the most accurate and fastest way of doing it."

Biometry using partial coherence interferometry might have trouble with mature or posterior subcapsular cataracts, he said.

"If you have a really dense cataract or a posterior subcapsular cataract, then it won't work," Dr. Cumming said. "In our studies we've found that immersion is better because, first, you can do all patients with immersion, and secondly we've had reports from some of our investigators of refractive surprises" using partial coherence interferometry or applanation A-scans.

"The conclusion we've come to now is that immersion is the best and fastest technique," he said.

More sophisticated

With patients demanding emmetropia after cataract surgery, A-scan technology must become more sophisticated.

"The number one feature I look for in an A-scan unit today is the ability to perform the immersion technique with

the Praeger shell," said **Sherrie Marney, COA.** "A system isn't worthy of review without that capability because that's the only technique I will use. With the sophisticated IOL technology that's available now and of course coming down the pipeline with regard to the accommodating IOL, practices must obtain axial lengths using a non-contact technique."

The price and size of the Axis II are among the machine's benefits, Ms. Marney said.

"It's price competitive," she said. "That's always important. Its ease of portability is not to be believed. It encompasses all the automatic features that are important for biometrists, but it also goes to the next level in giving you a lot of manual capabilities if you need to make changes yourself."

"You cannot achieve a perfect A-scan on every patient and sometimes there will be compromises. All A-scans make mistakes with pattern recognition. What I like about the Axis II is my ability to get the best scan possible for the patient and then reposition the measurement gates on a frozen scan if I disagree with the system's choice," Ms. Marney said. "The problem with many A-scan units available today is that their systems are 'locked,' allowing no manual gate changes on a frozen scan."

Other features of the Axis II include storage of up to 20 complete A-scan records for later review, ability to connect to any standard printer, storage of information for up to five physicians and selection of six formulae. DSN

by David Schonfeld
Staff Writer

For Your Information:

J. Stuart Cumming, MD, can be reached at 6 Journey, Ste. 270, Aliso Viejo, CA, 92656; (949) 916-9352; fax: (949) 716-8362. Dr. Cumming is chief scientific officer for C&C Vision. **Sherrie Marney, COA**, can be reached at 26423 Waterford Circle, Lake Forest, CA 92630; (949) 472-4157; email: smarney@aol.com. Ms. Marney has no direct financial interest in any product mentioned in this article. She is a paid consultant for C&C Vision.

■ More information on the **Axis II A-scan** can be obtained from Quantel Medical, 601 Haggerty La., Bozeman, MT 59717; (888) 660-6726; fax: (406) 586-2924.