

Critical Clinical Thinking



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Steps in Critical Clinical Thinking about A-Scans

It is possible to produce successful cataract/IOL surgery patient outcomes when critical clinical thinking is applied. Back in 1990 when my book **Ophthalmic Echography** was published, I dedicated an entire chapter to the subject of understanding the ocular optical relationships needed to interpret IOL calculations, thereby ensuring a desirable postoperative result. However, even in 2010, there are still cases of unintended IOLs being explanted due to an inability to interpret A-Scan echo patterns (as well as OCB patterns) and how to confirm which measurement is accurate. A low standard deviation is produced when measurements are repeated, and this would be called a precise number. However, accuracy is what we need in every pre-operative measurement. Producing a correct measurement from a proper echo pattern and caliper placement is accuracy.

Most Important Test in a Cataract Clinic

Performing accurate (not just precise) pre-operative Ks and axial eye length measurements is the single most important test being performed in any cataract clinic. Errors must be corrected with additional surgery.

Example of Ocular Relationships

Here is an example of critical ocular relationships: Patient 1 has an axial length of 25.00 (only 1.50 mm longer than average) yet has an Rx of -7D. Patient 2's eye is also 25mm yet has a Plano Rx. How can that be? It is explained when reviewing the patient's chart – Patient 1 has steep Ks and Patient 2's are flat. It makes sense now, and these unusual measurements are verified and correlate with patient visual history allowing us to make informed decisions that will benefit each patient's visual rehabilitation.

Be Both a Detective and Judge

When the Eye Cubed's IOL print-out flags measurements as "unusual and must be verified" the examiner and physician must both evaluate the A-Scan echo pattern, caliper (gate) placements, eye type (velocities) and patient history in order to confirm that they all make sense for that individual.

First Step - Routine Evaluation of Immersion A-Scan Echo Pattern

1. Is cornea echo double-peaked with both peaks of equal amplitude?
2. Are both anterior and posterior lens echoes tall?

First Step - Routine Evaluation of Immersion A-Scan Echo Pattern (continued)

3. Is the retina echo tall, straight, and with correct width? (about 3/4 mm wide and top is not a sharp pin-point)
4. Are scleral and orbital echoes present? (indicating sound beam at macula, not disc)
5. Are all calipers (gates) positioned on correct echoes? (not on iris, cataract or reverb echo)
6. Do Axial Length, ACD and Lens Thickness measurements make sense for the patient?

Second Step – Looking at the Whole Picture

1. Are the Axial Length and Keratometry measurements similar between eyes?
2. Is the desired IOL formula selected?
3. Does the selected IOL power make sense for the patient’s refractive history without cataract

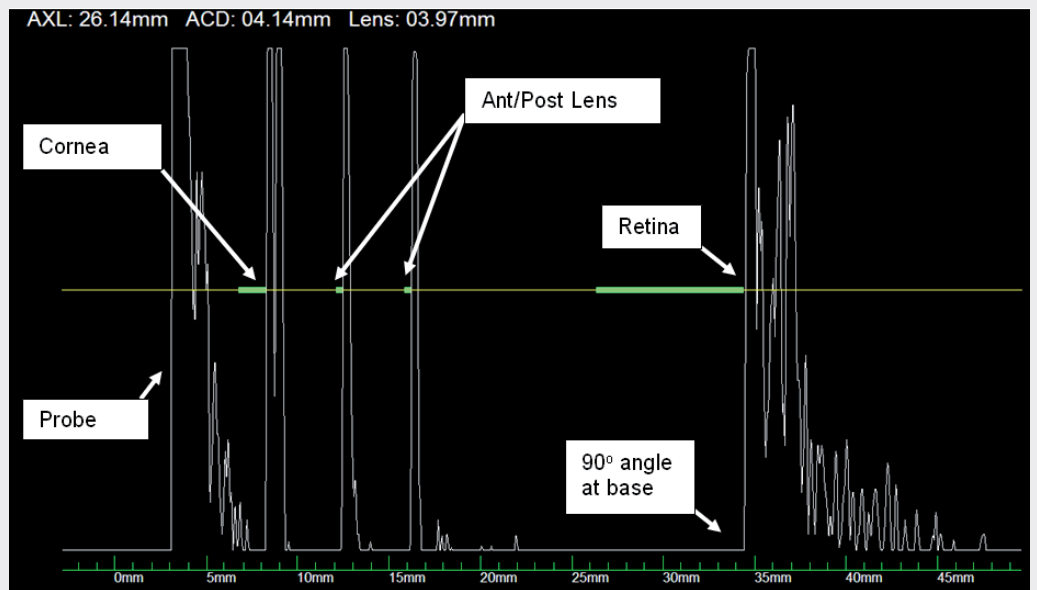
Visual Confirmation

To quote from the Eye Cubed™ Reference Guide:

“You must visually confirm that the measurement gates have been placed on the appropriate echoes for *every* scan. Failure to do so can lead to axial length errors of 3 mm or more.”

“Even the most intelligent ultrasound system can make mistakes; you are the ultimate judge in

determining when a scan is valid. The time that you invest in learning proper biometry techniques will be paid back with consistent, accurate patient outcomes.”



Successful IOL Surgery

An IOL exchange is nearly always a preventable surgery. Success will be enhanced with quality time spent in Critical Clinical Thinking.