

Biometry Pearls

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History

- ▶ Did the patient have prior surgery?
 - ▶ Lask/PRK/Refractive procedures change keratometry measurements
 - ▶ Retinal detachments – scleral buckling procedures elongate the eye 0.5mm to 1.0 mm
 - ▶ Is the patient phakic? Pseudophakic? If so, what lens materials (Silicone, PMMA, Acrylic)? Aphakic?
 - ▶ You will need to adjust the settings on IOL M, and/or A-scan
 - ▶ Do they have a PK or corneal opacity?
 - ▶ If you can't see the retina, a B-Scan is always indicated and billable!

What do you need for IOL calculators?

1. You need a good refraction and also their previous glasses as they may have a myopic shift due to the cataract
2. Good reliable K's (may need to do Topography as well (ie; Atlas or Pentacam)
3. Good axial eye length

Standard Biometry Parameters

- ▶ General rule multiple readings from a single eye should be within .2mm
- ▶ Between the 2 eyes should be within .3mm if it's not you may need to confirm the difference
- ▶ Standard values using immersion for corneal thickness is 0.55mm
anterior chamber phakic eye 3.24mm (+/- 0.44)
mean thickness of cataractous lens is 4.63mm (+/- 0.68) but can get as thick as 6.9mm
- ▶ *AC depth shallows as lens thickens
*These parameters hold true whether using ultrasound or optical biometry

IOL power calculation

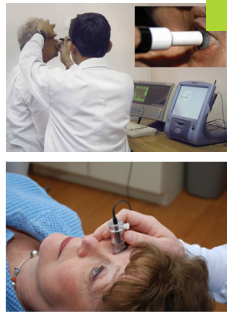
- ▶ Axial Length
- ▶ Keratometry Reading
- ▶ White-to-White
- ▶ Anterior Chamber Depth
- ▶ Various formulas can be used to calculate
- ▶ Measurements must be accurate!
 - ▶ A .33 mm error in axial length = 1 diopter error in the IOL calculations!
 - ▶ K's are diopter-for-diopter: A 0.5 diopter error = 0.5 diopter error in the IOL calculations!
 - ▶ These "little" errors can add up!

Calibration of Biometry Instruments

- ▶ Perform calibrations regularly as recommended by the manufacturer

A-Scan Ultrasonography

- ▶ Contact A-scan has a probe that touches central cornea.
- ▶ Immersion A-scan probe does not touch the eye; Prager shell/water bath combo is used.
- ▶ Portable units available, used in surgery



Optical Biometry

- ▶ IOL Master
- ▶ Lenstar



Corneal Astigmatism

- For Example: K's 42.00 x 90°/43.50 x 180°
- Sleep Meridian= "the bigger number"=43.50
- Flat Meridian= "the smaller number"= 42.00
- Difference between two meridians = amount of corneal astigmatism
 - 43.50-42.00 = 1.50D
 - Plus cylinder power: +1.50D x 180° or
 - Minus cylinder power: -1.50D x 90°
- Keratometry does NOT measure lenticular astigmatism

Keratometry

- Measures the central curvature of the anterior cornea
- Readings are called K-readings
- Measures in two meridians (90 degrees from each other)
- Measured in diopters
- Average cornea has a power of 42.00-44.00 D
- Be sure to be versed in handheld keratometer

Take home lessons...

- Pt with RD with measure shorter and needs immersion for correct AEL (may need to adjust aim for SB)
- Verify with surgeon how long contacts out prior to measure
- May need to use fellow eye for measurements
- Nystagmus may be a challenge

THANK
YOU !!!!

Goodbye
&
GOOD LUCK

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