Financial Disclosure

- I have the following financial interests or relationships to disclose:
  - Abbott Medical Optics: C;
  - AcuFocus, Inc.: C,O;
  - Alcon Laboratories, Inc.: C;
  - ArcScan: C,O;
  - Carl Zeiss Inc: C;
  - Clerio Vision: C,O;
  - Oculus, Inc.: C;
  - OcuPhire: C,O;
  - RX Vision: C,O;
  - M & S Technologies: C;
  - Visiometrics: C,O;

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Pitfalls –Kconus & Post Ref

1. *Keratometry is inaccurate* after corneal refractive surgery and keratoconus
2. *Prediction of Effective Lens Position (ELP) is inaccurate using keratometry after refractive surgery and keratoconus*
3. *Optical Biometry is inaccurate* in long eyes which is extremely common with refractive surgery and keratoconus

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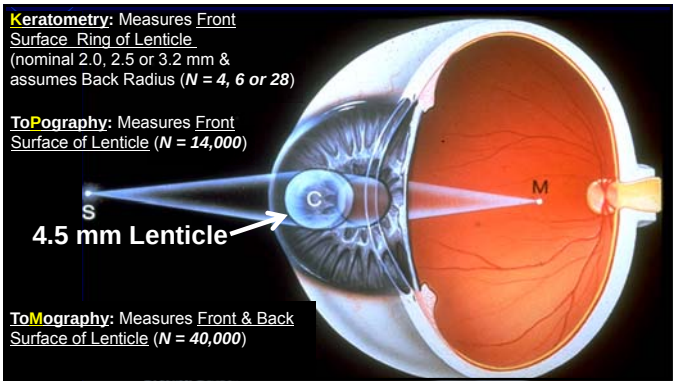

Methods for K

1. Historical Method: Pre K + Δ Ref
2. Koch K Mod: Current Ring K – 25% Δ Ref
3. Koch Topo Mod: Curent Zone K – 15% Δ Ref
4. Contact Lens: CL Base Curve + Δ Ref w RGP
5. 4.5 mm Zonal K with Topo or Tomo
6. Manually use mouse centrally PO Ref and around "cap" in Kconus
7. ASCRS Website

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Inaccurate Keratometry - Kconus

1. *Cornea becomes a simultaneous bifocal with a distance and bifocal power ("Cap" power)*
2. *Cap power can be determined by testing location of near vision with BSCDV in place*
3. *Stage 1: 2 to 3 D Stage 2: 3 to 5 D Stage 3: > 5 D*

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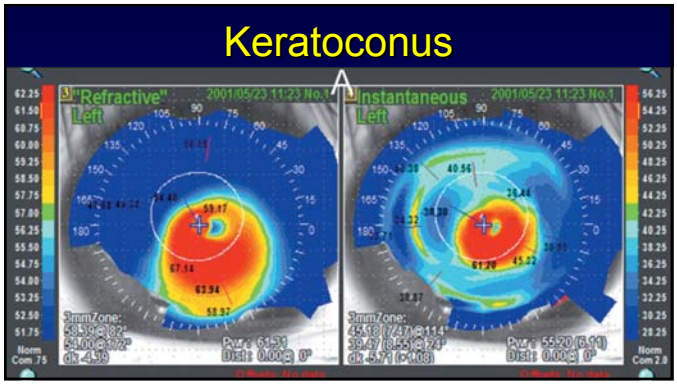

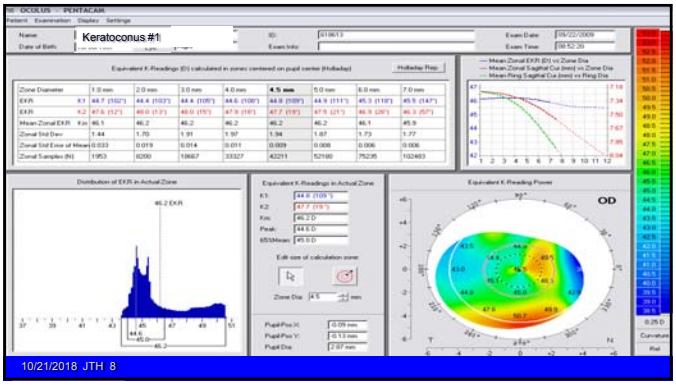

Inaccurate K's – Post Ref

1. *Cornea is flattest in the center and usually no longer prolate*
2. *If centered on pupil it will be asymmetric relative to the visual axis*
3. *Actual pupil size has an effect of power of cornea*

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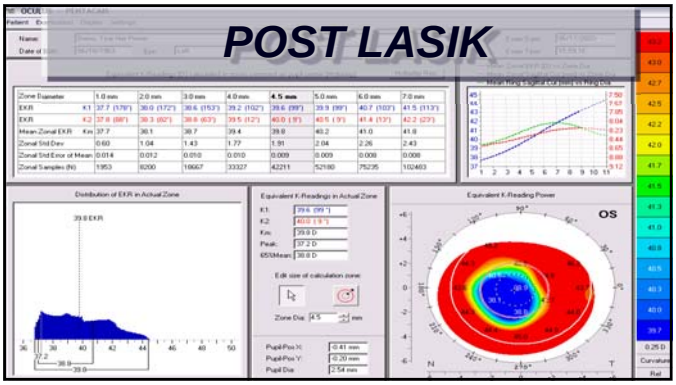

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ELP Prediction

1. Most formulas use K to predict ELP
2. K must be prior to refractive surgery (and not "cap" of cone)

"Double K Method"

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Holladay Report – Pentacan Upper Right Panel

- **Can estimate the PRE-REF K from back surface in PRK & LASIK with toMography**

Pupil Dia:	+	2.67 mm	x:	0.20 mm N	y:	0.32 mm I (rel. to VN)
HWTW:	[ ]		x:		y:	(rel. to VN)
Pachy Min:	○	395 µm	x:	0.07 mm N	y:	0.39 mm I (rel. to VN)
Est. Pre-Refr. Km:		47.6 D	Refr.Change:	-7.8 D		
A. C. Depth (Ext.):		3.68 mm	Chord µ:	0.38 mm	QS:	OK

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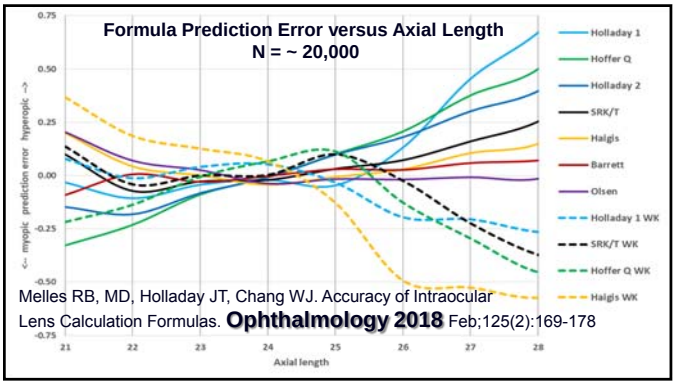

Melles RB, MD, Holladay JT, Chang WJ. Accuracy of Intraocular Lens Calculation Formulas. **Ophthalmology 2018** Feb;125(2):169-178

Long Eye Adjust

- Wang/Koch Linear Regression to compensate for Long Eyes (> 25) **JCRS Nov 2011**; 37 (11):2018–27
- Wang-Koch axial length adjustment formulas in long eyes. **JCRS Oct 2018**; 44 (10):1291– 2.

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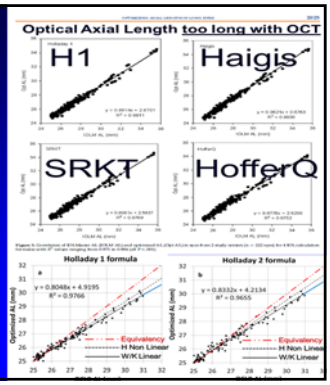

Summary

1. Keratometry is inaccurate due to sample size and should be replaced with ZONAL toPography or toMography
2. Effective Lens Position (ELP): *"Double K Method"* must use normalized corneal power (paracentral Kconus or Pre Ref Sx)
3. Axial Length in long eyes (> 25 mm) must be shortened in ALL but Olsen Formula.

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