


**IOL Power Calcs for Phakic IOLs  
(2<sup>o</sup> Piggy-Back & IOL Exchange after  
Refractive Surprise)**


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### 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;
  - Elenza: C,O;
  - Oculus, Inc.: C;
  - Visiometrics: C,O;
  - Wavetec: C

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- Outline & ADVANCED IOL CALCS - 10/21/2014 (6.1 MB)
- Multifocal IOL Blur - 10/20/2014 (345 KB)
- Pentacam Holladay Report Interpretation Guidelines - 10/14/2014 (1.6 MB)
- Biometry for Premium IOLs 10x9 - 10/21/2012 (1.7 MB)
- Phakic IOL Calcs 10x9 - 10/19/2011 (475 KB)
- Analyzing Individual & Aggregate Astigmatism - 7/6/2006 (375 KB)
- New Automated CSE Testing - 7/6/2006 (2.6 MB)

### Phakic IOL's

- Compete with corneal refractive procedures for high myopia and med & high hyperopia
- ACL, ICL or Iris Clip ?

02/07/07, III, 5



### Phakic IOL's (Secondary Piggy Back IOL's)

# Refraction Formula

02/07/07, III, 7

## Refraction Formula (Axial Length not required)

- ❶ Phakic IOL
- ❷ Secondary Piggy-Back IOL
- ❸ Aphakic IOL

## Phakic IOL Calculation Input Variables

- Refraction and Vertex
- Keratometry
- Desired Refraction
- Predict ELP (ACD)  
Effective Lens Position

## Phakic IOL Calculations

- + IOL's to Specs ~ 1.5 to 1
- - IOL's to Specs ~ 1.0 to 1
- Approximation only

## REFRACTION FORMULA

$$IOL = \frac{1336}{\frac{1000}{PreRx} - V + K} - ELP - \frac{1336}{\frac{1000}{DPostRx} - V + K} - ELP$$

Holladay, J.T.: "Refractive Power Calculations for Intraocular Lenses in the Phakic Eye." *American Journal of Ophthalmology*. Volume 116:63-66, July 1993.

## Phakic IOL Calculation Input Variables

Refraction and Vertex  
Soft Contact Lens @ Vtx = 0  
w Small Over-Refract (< ± 2 D)  
is most accurate.

## Effective Lens Position (ELP) OLD ACD

- Verisye Avg ELP = 4.27 mm
- AACD (20 y/o) = 3.60 mm

**AACD + 0.67 mm = ELPx**

## Effective Lens Position (ELP) OLD ACD

- Visian ICL Avg ELP = 4.00 mm
- AACD (20 y/o) = 3.60 mm

**AACD + 0.40 mm = ELPx**

## Effective Lens Position (ELP) OLD ACD

- Visian ICL Avg ELP = 4.00 mm

White to White (mm)	ACD (mm)	Recommended ICL Length
<10.5	All	Not Recommended
10.5-10.6	<=3.5	12.1
10.5-10.6	>3.5	12.1
10.7-11.0	All	12.1
11.1	<=3.5	12.1
11.1	>3.5	12.6
11.2-11.4	All	12.6
11.5-11.6	<=3.5	12.6
11.5-11.6	>3.5	13.2
11.7-12.1	All	13.2
12.2	<=3.5	13.2
12.2	>3.5	13.7
12.3-12.9	All	13.7
>=13	All	Not Recommended

## The Holladay IOL Consultant

“Windows” Data Base Program  
for  
Standard and Advanced  
IOL Calculations

The screenshot shows the 'Pre Op Data' window for a patient named IOL\_Phakic. It displays fields for PreOp Date (8/13/96), Surgeon (Example, Iman), and Current Age (22). The interface is split into two columns for the right eye (OD) and left eye (OS). Each column contains sections for Calculation Type (Standard IOL, Toric IOL, Bifocal IOL), Pre-existing conditions (Phakic Pathology, Keratoconus, etc.), Refraction (BCVA, UCVA, K1, K2), and Ultrasound (Axial Lens, Phakic ACD). Buttons for 'OK', 'Cancel', and 'Help' are visible at the bottom.

This close-up shows the 'Pre Op Data' window for the right eye (OD). It includes the patient name 'IOL\_Phakic', ID '1111', and age '22'. The PreOp Date is set to 8/13/96. The Surgeon is 'Example, Iman'. Under 'Calculation Type', 'Other Calculations' is selected. 'Tgt. Ref.' is -0.5. Under 'Pre-existing condition', 'Previous RK, Prk, Alk, Lasik...' is checked.

This close-up shows the 'OD(Right) Pre Op Special Data' window. It has radio buttons for 'Phakic Eye', 'Aphakic Eye', and 'PseudoPhakic Eye'. The 'Phakic Eye' option is selected, with sub-options for 'AC, PC or ICL Lens Calc. from Ref. (no Lens Removal)'. There are also options for 'New PC Lens' (in Bag or in Sulcus) and 'Standard IOL or Exchange IOL' (lens calc from AU) or 'Secondary Piggy-Back IOL' (lens calc from Ref. or AU). A note at the bottom states: 'NOTE: IOL Material and power of the lens in the eye must be entered, to activate "Correct AU" button.'

