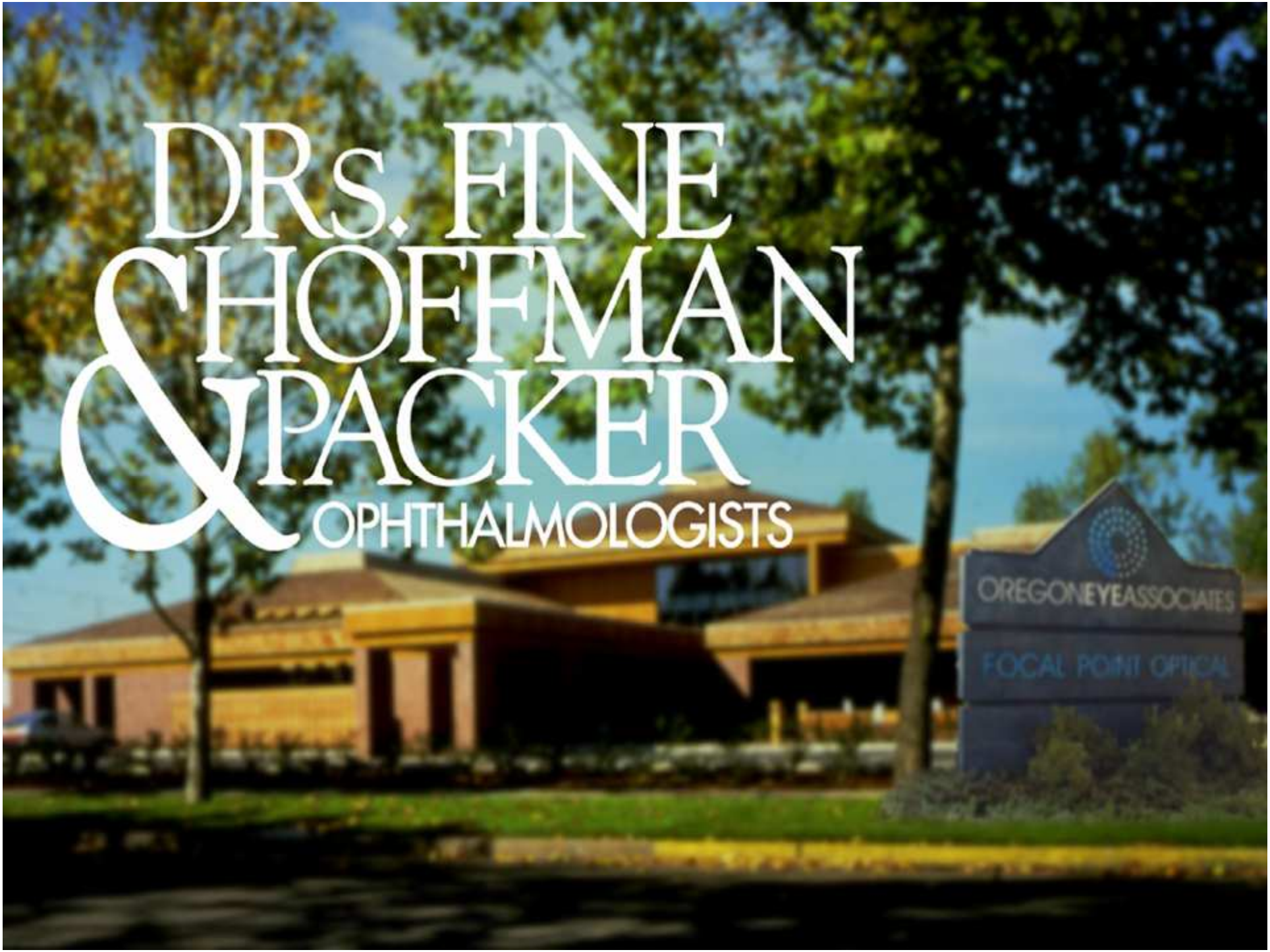

DRs. FINE
& HOFFMAN
& PACKER
OPHTHALMOLOGISTS
OREGONEYEASSOCIATES
FOCAL POINT OPTICAL

Dealing With
The Refractive Surprise

Richard S. Hoffman, MD

Clinical Associate Professor of Ophthalmology

Casey Eye Institute

Oregon Health and Science University

No Financial Interest

Why The Surprise?

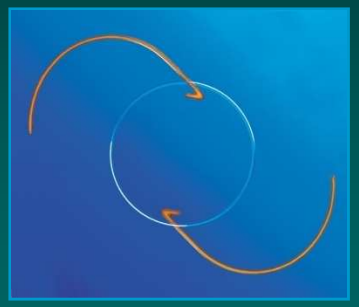
- Correct patient / Correct lens
- Long or short eye
- Proper IOL formula – Holladay 2
- Data inserted correctly
- Previous refractive surgery

Is It Easily Reversible?

- Lens properly inserted
  - Crystalens upside-down yields myopic shift
- Capsular block
  - Reversed easily with YAG
- Lens exchange
  - Can’t guarantee second lens will be right unless you know why the first lens was wrong
  - ? For small errors
  - How long since original surgery ?

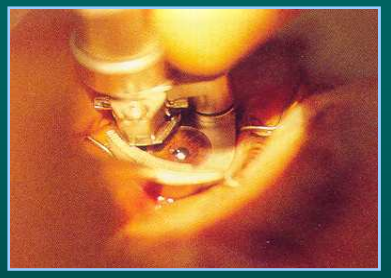
Best Treatment for Enhancement

Piggyback versus Corneal Refractive Surgery



Staar AQ5010

- Piggyback
  - Straightforward
  - Somewhat accurate
  - Relatively expensive compared to LASIK
- Corneal Refractive Surgery
  - Straightforward
  - Generally accepted as benign procedure
  - Treats astigmatism at the same time
  - Much less expensive than piggyback



Piggyback IOL Calculations

Piggyback IOL Calculations

Easily calculated utilizing
the Holladay IOL Consultant
(R Formula)

HicSoapPro - Iol Calc Report

Report Date: **10/21/2009**

Patient: ID: **PB** Date of Birth: Sex: **Female**

Pre-Op. Data

	OD	OS
Surgeon:	**HOFFMAN, RICHARD S. 04/16/2008**	
Refraction:	**+3.50 +2.75 X 70**	
Vertex:	**12.00**	
BCVA:	**20/20**	
UCVA:	**?????**	
K1:	**41.26 @169**	
K2:	**46.11 @79**	
Average K:	**43.69**	
Adjusted K:	**43.69**	
Axial Len:	**23.55 ILM**	
Adj. AL:		
Hor W-t-W:	**12.50**	
Phakic ACD:	**3.83**	
Phakic Lens Th.:	**0.00**	
Target Ref:	**0.00**	
Tgt Add:	**0.00**	

	OD	OS
Surgeon:		
Refraction:		
Vertex:		
BCVA:		
UCVA:		
K1:		
K2:		
Average K:		
Adjusted K:		
Axial Len:		
Adj. AL:		
Hor W-t-W:		
Phakic ACD:		
Phakic Lens Th.:		
Target Ref:		
Tgt Add:		

Additional Data

	OD	OS
Eye Status:	**Pseudophakic**	
New PC Lens:	**in sulcus**	
	Secondary Piggy-Back IOL	
PreOp Pathology:	**No**	
Prev. Rk... :	**No**	
Keratoconus:	**No**	
Scleral Buckle:	**No**	
Silicone in Vitreous Cavity:	**No**	
Eye Status:		
New PC Lens:		
PreOp Pathology:		
Prev. Rk... :		
Keratoconus:		
Scleral Buckle:		
Silicone in Vitreous Cavity:		

Formula: **Holladay R**

Lens #1 **Staar AQ-5010V**
Procedure: **Std Phaco**
MFG ACD: 5.55

IOL	Pred. Ref.
3.50	2.82
4.00	2.52
7.92	**0.00**
Lens Power NA	
Lens Power NA	

Lens #2 **Staar AQ-2010V**
Procedure: **Std Phaco**
MFG ACD: 5.55

IOL	Pred. Ref.
6.00	1.26
7.00	0.61
7.92	**0.00**
8.00	-0.05
9.00	-0.74

Formula:

Lens #3 **AMO CLRFLXC**
Procedure: **Std Phaco**
SRG Entered ACD: 5.12

IOL	Pred. Ref.
7.00	0.42
7.50	0.08
7.61	**0.00**
8.00	-0.27
8.50	-0.63

IOL Consultant Notes

The probability of this IOL is < 0.1%

HicSoapPro - Iol Calc Report

Report Date: 7/5/2007

Patient: ID: Date of Birth: 17-Apr-1956 Sex: Male

Pre-Op. Data

OD

Surgeon: HOFFMAN, RICHARD S. 07/02/2007
Refraction: -10.00 +0.75 X 150 Axial Len: 28.51 ILM
Vertex: 12.00 Adj. AL:
BCVA: 20/30 Hor W-t-W: 12.20
UCVA: ????? Phakic ACD: 4.17
K1: 44.00 @27 Phakic Lens Th.: 0.00
K2: 44.88 @117 Target Ref: 0.00
Average K: 44.44 Tgt Add: 0.00
Adjusted K: 44.44

OS

Surgeon: HOFFMAN, RICHARD S. 07/02/2007
Refraction: -15.00 +0.00 X 0 Axial Len: 29.09 ILM
Vertex: 12.00 Adj. AL:
BCVA: 20/50 Hor W-t-W: 12.20
UCVA: ????? Phakic ACD: 4.30
K1: 43.72 @170 Phakic Lens Th.: 0.00
K2: 44.56 @80 Target Ref: 0.00
Average K: 44.15 Tgt Add: 0.00
Adjusted K: 44.15

Additional Data

OD

Eye Status: Phakic
New PC Lens: in bag
PreOp Pathology: No
Prev. Rk... : No
Keratoconus: No
Scleral Buckle: No
Silicone in Vitreous Cavity: No

Formula: Holladay II

Lens #1 AMO NXG1
Procedure: Std Phaco
MFG ACD: 5.20

IOL	Pred. Ref.
Lens Power NA	
Lens Power NA	
4.49	**0.00**
6.00	-0.92
6.50	-1.23

Lens #2 Staar AQ-5010V
Procedure: Std Phaco
MFG ACD: 5.55

IOL	Pred. Ref.
3.50	0.67
4.00	0.39
4.68	**0.00**
Lens Power NA	
Lens Power NA	

Lens #3 AMO AR 40e
Procedure: Std Phaco
MFG ACD: 5.20

IOL	Pred. Ref.
3.50	0.59
4.00	0.29
4.49	**0.00**
4.50	-0.01
5.00	-0.31

Lens #4 Alcon MTA4UO
Procedure: Std Phaco
MFG ACD: 3.39

IOL	Pred. Ref.
Lens Power NA	
Lens Power NA	
3.67	**0.00**
5.00	-0.98
5.50	-1.36

OS

Eye Status: Phakic
New PC Lens: in bag
PreOp Pathology: No
Prev. Rk... : No
Keratoconus: No
Scleral Buckle: No
Silicone in Vitreous Cavity: No

Formula: Holladay II

Lens #1 AMO NXG1
Procedure: Std Phaco
MFG ACD: 5.20

IOL	Pred. Ref.
Lens Power NA	
Lens Power NA	
3.36	**0.00**
6.00	-1.65
6.50	-1.98

Lens #2 Staar AQ-5010V
Procedure: Std Phaco
MFG ACD: 5.55

IOL	Pred. Ref.
2.50	0.57
3.00	0.29
3.49	**0.00**
3.50	-0.00
4.00	-0.30

Lens #3 AMO AR 40e
Procedure: Std Phaco
MFG ACD: 5.20

IOL	Pred. Ref.
2.50	0.51
3.00	0.21
3.36	**0.00**
3.50	-0.09
4.00	-0.39

Lens #4 Alcon MTA4UO
Procedure: Std Phaco
MFG ACD: 3.39

IOL	Pred. Ref.
Lens Power NA	
Lens Power NA	
2.76	**0.00**
5.00	-1.68
5.50	-2.07

HicSoapPro - Iol Calc Report

Report Date:

Patient: ID: Date of Birth: **17-Apr-1956** Sex: **Male**

Pre-Op. Data

	OD	OS
Surgeon:		Surgeon: **HOFFMAN, RICHARD S. 07/05/2007**
Refraction:		Refraction: **-1.65 +0.00 X 0**
Axial Len:		Axial Len: **29.09 ILM**
Vertex:		Vertex: **12.00**
Adj. AL:		Adj. AL:
BCVA:		BCVA: **20/30**
Hor W-t-W:		Hor W-t-W: **12.20**
UCVA:		UCVA: **?????**
Phakic ACD:		Phakic ACD: **4.30**
K1:		K1: **43.72 @170**
Phakic Lens Th.:		Phakic Lens Th.: **0.00**
K2:		K2: **44.58 @80**
Target Ref:		Target Ref: **0.00**
Average K:		Average K: **44.15**
Tgt Add:		Tgt Add: **0.00**
Adjusted K:		Adjusted K: **44.15**

Additional Data

	OD	OS
Eye Status:		Eye Status: **Pseudophakic**
PreOp Pathology:		PreOp Pathology: **No**
New PC Lens:		New PC Lens: **in sulcus**
Prev. Rk... :		Prev. Rk... : **No**
Keratoconus:		Keratoconus: **No**
Scleral Buckle:		**Secondary Piggy-Back IOL** Scleral Buckle: **No**
Silicone in Vitreous Cavity:		Silicone in Vitreous Cavity: **No**

Formula: Holladay II

Formula: Holladay R

Lens #1 **AMO NXG1**
Procedure: **Std Phaco**
MFG ACD: 5.20

IOL	Pred. Ref.
Lens Power NA	
Lens Power NA	
-2.71	**0.00**
6.00	-5.69
6.50	-6.06

Lens #2 **Staar AQ-5010V**
Procedure: **Std Phaco**
MFG ACD: 5.55

IOL	Pred. Ref.
-3.50	0.37
-3.00	0.09
-2.83	**0.00**
-2.50	-0.19
-2.00	-0.47

Piggyback IOL Calculations

No Holladay IOL Consultant

Piggyback IOL

Gills Nomogram

- Underpowered Pseudophake (Hyperope)
  1. Short Eye (<21mm): Power = (1.5 x SE) + 1
  2. Average Eye (22-26mm): Power = (1.4 x SE) + 1
  3. Long Eye (>27mm): Power = (1.3 x SE) + 1

- Overpowered Pseudophake (Myope)
  1. Short Eye (<21mm): Power = (1.5 x SE) - 1
  2. Average Eye (22-26mm): Power = (1.4 x SE) - 1
  3. Long Eye (>27mm): Power = (1.3 x SE) - 1

Piggyback IOL

Nichamin Nomogram

Sulcus IOL : AQ5010V

- Minus power = 1:1 (-2D SE = -2D IOL)
- Plus power = 1:1.5 (+2D SE = +3D IOL)

Piggyback IOL

Brown's Refractive Reasoning

0.50 D IOL power = 0.37 D at the spectacle plane

Piggyback IOL Choices

AMO Sensar

- Acrylic
- 6.0 mm optic
- 13.0 mm overall length
- OptiEdge (rounded front)
  - ↓ Pigment dispersion
- -10.0 to +30.0 (half-diopter steps)

Staar AQ 2010 and AQ5010

Thin Optic Edges

- Silicone
- 6.3 mm optic (larger optic = ↓ iris capture)
- AQ2010

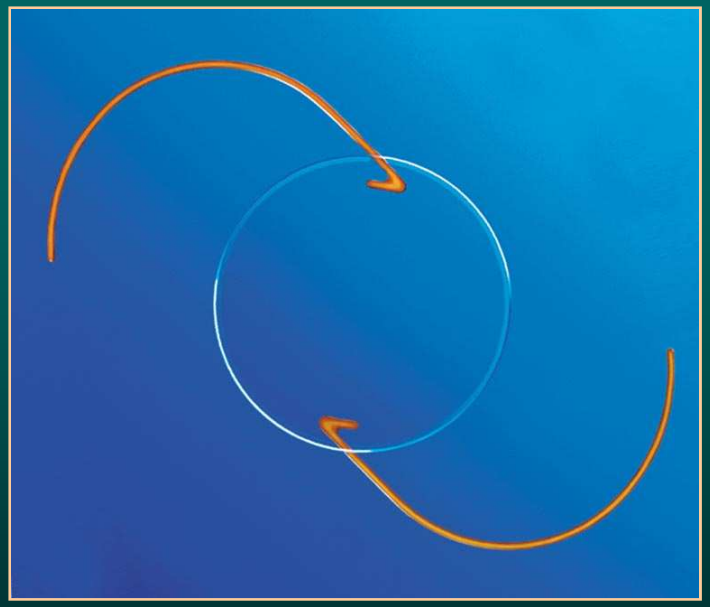
  13.5 mm length

  +5 to +9 D (whole D steps)

  +9.5 to 30 D (half D steps)
- AQ5010

  14 mm length

  -4 to + 4 D (whole D steps)



Raynor Sulcoflex

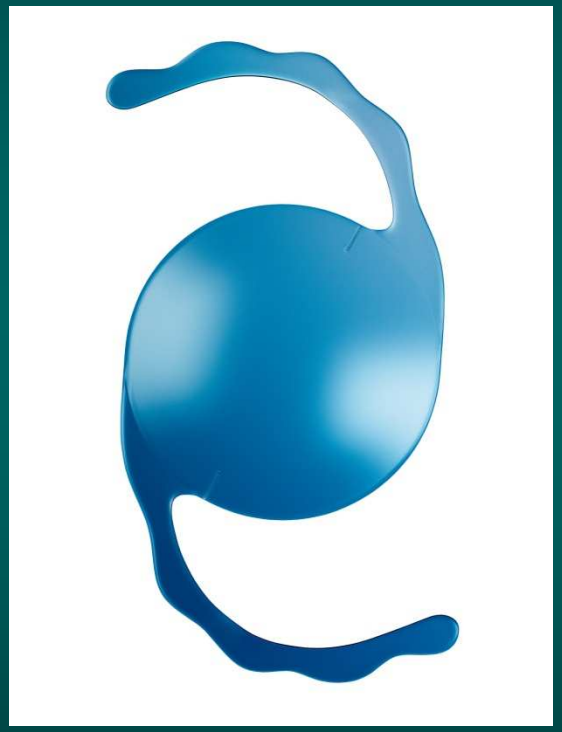
Not FDA Approved

- Designed for sulcus placement
- Hydrophilic acrylic
- Aberration-neutral

  6.5 mm aspheric optic
- Posterior concave

  surface avoids physical contact between IOLs
- Undulating haptics with posterior 10° angulation
  - Reduced risk of Pigment Dispersion Syndrome
  - Rotational stability

Raynor Sulcoflex



Sulco*flex*® Toric

Sulco*flex*® Multifocal

How Long Do You Wait?

Ideally as long as possible to allow LEC metaplasia and fibrosis to be completed

- Refractive stability usually achieved by 2 weeks but can be longer

Piggyback IOL

Excimer Laser Enhancement

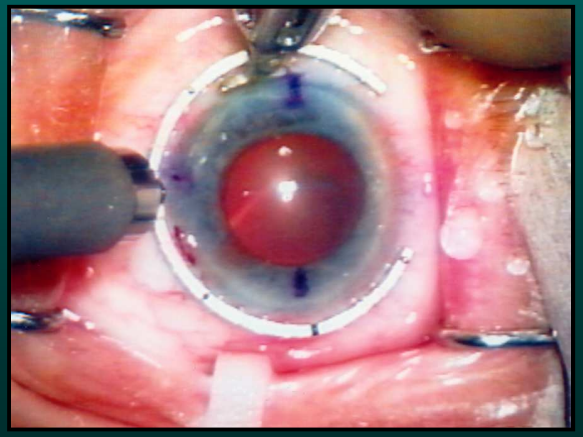
How Long Do You Wait?

LASIK vs. PRK

- PRK can be done anytime
- LASIK – When is the incision stable?
  - Nobody knows for sure
  - Marked elevation in IOP from microkeratome
  - Wait at least 6 weeks and probably 3 months
  - If unacceptable to patient then PRK

PRK or LASIK

- Many of these patients have received LRIs
- Small risk of epithelial ingrowth
- Tend to be older patients – possible dry eye
- For most patients – PRK rather than LASIK

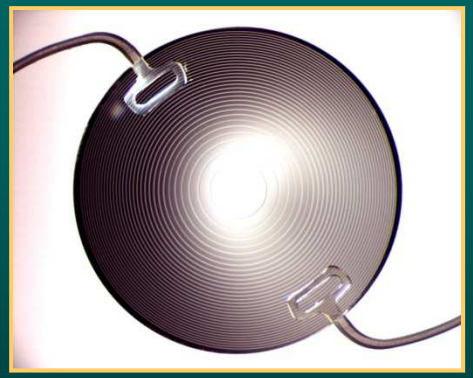


PRK

- 20% Ethanol (1cc 100% Ethanol + 4 cc BSS)
- 8.0 mm trephine or OZ marker
- 20-30 seconds
- Remove easily with
  #64 Beaver blade
- BCL
  - Antibiotic
  - Non-steroidal
  - Steroid

Wavefront Treatments

- Usually not reliable through a multifocal IOL
- Do we want to treat multifocal aberrations?
- Just treat the manifest refraction
- Accommodating IOLs OK



Enhancements

- Prepare patient pre-op
  - Give percentages for enhancement
  - Give additional costs – No surprises
  - Undersell don’t oversell

Enhancements

Enhancements

Enhancements

- Prepare patient pre-op
  - Give percentages for enhancement
  - Give additional costs – No surprises
  - Undersell don’t oversell
- Reassure patient post-op
  - Easily enhanced
  - Enhancements are relatively safe
  - Try not to belittle their concerns
  - Go the extra mile for the unhappy patient
  - Discuss risk/benefit when they get obsessive


Obrigado