

Targeting Zero Cylinder in Refractive Cataract Patients: Choosing Between Treatment Options

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Disclosure

- ◆ I am a consultant for:
 - Allergan
 - Alcon
 - AMO
 - Bausch and Lomb
 - Eyemaginations
 - Insite
 - Inspire
 - TLC Laser Centers
 - Wavetec

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Refractive Legend #1: Presbyopic IOL patients will tolerate small refractive errors

- ◆ **WRONG**
- ◆ Presbyopic IOL patients are incredibly sensitive to small refractive errors.
- ◆ Refractive cataract surgeons must be willing and able to treat post-op refractive errors.

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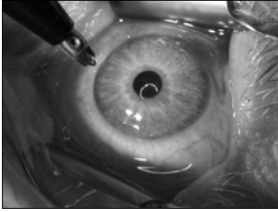
Intraoperative Solutions: Limbal Relaxing Incisions

<p><u>Pros</u></p> <ul style="list-style-type: none"> ◆ Inexpensive ◆ Easy to perform ◆ Minimal instrumentation ◆ Can be done at time of cataract surgery ◆ No impact on cataract healing ◆ Can be repeated 	<p><u>Cons</u></p> <ul style="list-style-type: none"> ◆ Must have topographer and be able to interpret topography ◆ May induce irregular astigmatism when greater than 2.0D ◆ Risk of perforation ◆ Less precise than laser vision correction
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Where Do You Place Your LRI During Cataract Surgery?

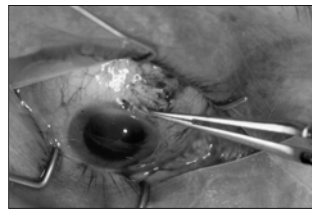
- ◆ Refractive axis
- ◆ Keratometric axis
- ◆ Topographic axis



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Intraoperative Solutions: Calculating Incision Induced Astigmatism

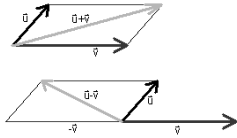
- ◆ **First step: Calculate surgically induced cylinder from incision**



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Elementary Vector Analysis Calculating Incision Induced Astigmatism

- ◆ In order to measure many physical quantities, such as astigmatism, we need to determine both a magnitude and a direction. Such quantities are conveniently represented as vectors.



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Intraoperative Solutions: Calculating Astigmatism

- ◆ Use AMO LRI Calculator available online at:
www.LRIcalculator.com

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1. Go To: www.LRIcalculator.com

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2. Input Patient Data

AMO LRIcalculator.com
ADVANCED MEDICAL OPTICS Patient Printing software version 3.0

Doctors Name: Dr. Rosenfield
Patient Name or ID: 01234
Patient Age: 65
Eye Selection: OD (right) OS (left)

Steep Meridian: 45 0° - 180°
Flat Meridian: Auto Entry
Steep K: 38.00 35.00 D - 50.00 D
Flat K: 36.00 35.00 D - 50.00 D

Phaco Incision: No Yes
Surgically Induced Cylinder: 1.00 0.0 D - 1.0 D Def. O.S.D
Incision Location (IL): 0 0° - 340° Use Steep

Please review patient information and press 'continue'!
reset continue

Surgeons View: 270°, 225°, 180°, 135°, 90°, 45°, 0°

Caption:
Phaco-Incision: _____ Steep Axis: _____
LRI-Incision: _____ Flat Axis: _____

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3. Print Output and Make LRI

AMO LRIcalculator.com
ADVANCED MEDICAL OPTICS Patient Printing software version 3.0

Doctors Name: Dr. Rosenfield
Patient Name or ID: 01234
Patient Age: 65
Eye Selection: OS - Left Eye

Steep Meridian: 45 / 225
Flat Meridian: 135 / 315
Steep K: 38.00 D
Flat K: 36.00 D
Preoperative Astigmatism: 1.00 D
Phaco Incision: Yes
Surgically Induced Cylinder: 1.00
Incision Location (IL): 0

New-Steep K: 38.12 D New-Flat K: 35.88 D
Astigmatism: 2.24 D Treatment: 1.75 D
LRI-Incisions: 2 Incision Size: 85°/2.8 C.H. 145°/1.5 C.H.
To fully correct all astigmatism, you may need an additional procedure.

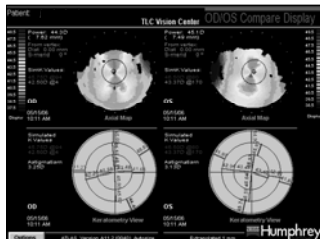
Print edit print

Caption:
Phaco-Incision: _____ Steep Axis: _____ 58 / 238
LRI-Incision: _____ Flat Axis: _____ 148 / 228
This tool uses vector analysis and assumes the phaco incision will shift the Steep and Flat Meridians as shown above.

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Intraoperative Solutions: Overcoming LRI Challenges

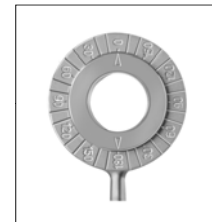
- ◆ Understanding topography
 - Must become adept at reading topo maps to determine where to place the incisions
 - Planning requires a little extra attention



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Intraoperative Solutions: Overcoming LRI Challenges

- ◆ Placement of incisions
 - Must maintain correct orientation during surgery.
 - Mark 90 degree axis while sitting up to avoid cyclotorsion
 - Many template instruments available



Dell Astigmatism Marker Rhein Medical

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Intraoperative Solutions: Overcoming LRI Challenges

- ◆ Making the incisions
 - Diamond knife required
 - Choose a knife w/pre-set depth of 500-600µm
 - Eliminates need for pachymetry or knife calibration
 - Well within skill set of any cataract surgeon

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Intraoperative Solutions: LRI's Made Simple

- ◆ < 0.75 D Cyl: Intraoperative LRI or perform an On-Axis incision
 - If the astigmatism axis is within 15 degrees of the incision then move your incision to the axis
 - If the astigmatism axis is outside of 15 degrees from the incision site, place your incisions where comfortable and perform LRI
- ◆ 0.75-1.5D Cyl: Perform intraoperative LRI
- ◆ > 1.5D Cyl: Intraoperative LRI to "debulk" astigmatism + Post-op LASIK or PRK

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Nomograms

- ◆ J. Gills
- ◆ D. Koch
- ◆ R. Lindstrom
- ◆ B. Wallace
- ◆ S. Thorton
- ◆ L. Nichamin

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Astigmatic Nichamin Age & Pach-Adjusted Intralimbal Arcuate Nomogram *NAPA "WITH-THE-RULE"*

PREOP CYL (Diopters)	Paired Incisions in Degrees of Arc			
1.00	45	40	40	35
1.50	60	55	50	45
2.00	70	65	60	55
2.50	80	75	70	65
3.00	90	90	85	80

Based upon Pachymetry, incisions are made at 90% depth

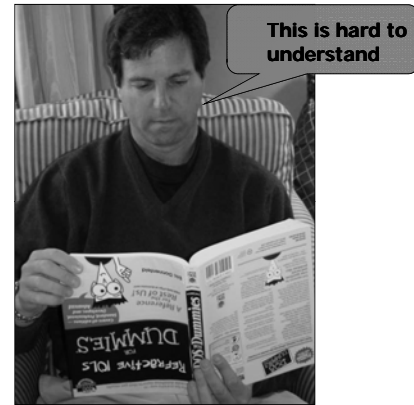
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NAPA "AGAINST-THE-RULE"

PREOP CYL (Diopters)	Paired Incisions in Degrees of Arc			
1.00	50	45	45	40
1.50	60	60	55	50
2.00	70	70	65	60
2.50	80	80	75	70
3.00	90	90	85	80

Based upon Pachymetry, incisions are made at 90% depth

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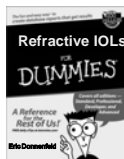


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Limbal Relaxing Incisions for Dummies Donnenfeld Nomogram- "DONO"

- 0.50 D: 1 incision 1 and a half clock hours
- 0.75 D: 2 incisions 1 clock hour
- 1.50 D: 2 incisions 2 clock hours
- 3.00 D: 2 incisions 3 clock hours

- ◆ A little more for against the rule and younger patients.
- ◆ A little less for older patients.
- ◆ Personalize your nomogram



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Intraoperative Solutions: Getting Started with LRI's

- Step 1: Start in OR with a peribulbar block
- Step 2: Pre-set 0.6 mm depth diamond blade
- Step 3: Limbal relaxing incision 1/2 mm in from limbus.
- Step 4: Fixate globe with .12 forceps 180 degrees away from incision.

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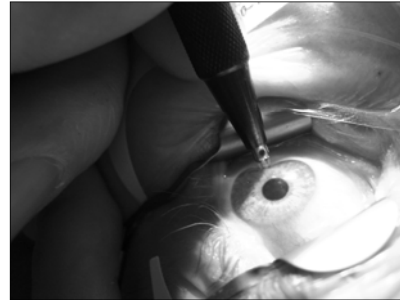


Intraoperative Solutions: Getting Started with LRI's

- Step 5:** Use upside down topography and center incisions on steep axis (+cylinder).
- Step 6:** Set diamond knife perpendicular in cornea, hold like a dart, allow blade to seat fully then pull slowly towards surgeon.

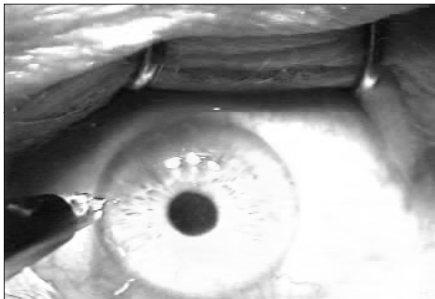
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Intraoperative Solutions: Limbal Relaxing Incisions



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Intraoperative Solutions: Limbal Relaxing Incision



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Refractive Legend #2: Surgeons are Not Comfortable Performing Limbal Relaxing Incisions

- ◆ **WRONG.**
- ◆ Surgeons do not have access to operating microscopes in their offices.



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Limbal Relaxing Incisions for Dummies

- ◆ Limbal relaxing incisions can be performed easily at the slit lamp.
 - Lidocaine gel.
 - Can be repeated one month later.
- ◆ Use phoropter to locate incisions and center incisions on steep axis (+cylinder).



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Slit Lamp Limbal Relaxing Incision



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Postoperative Solutions: Residual/Induced Cylinder

- ◆ **LRI vs Excimer Laser Enhancement**
 - **< 1D Cylinder: Additional LRI or LVC**
 - **> 1D Cylinder: LVC**

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Postoperative Solutions: Laser Vision Correction

- ◆ **Do you need to learn LASIK?**
 - **NO!**
- ◆ **Start with PRK**
 - **Less stressful**
 - **Excellent, repeatable results**
 - **Older patients often have less adherent epithelium and will do well with PRK**

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Postoperative Solutions: Laser Vision Correction

- ◆ **Approximately 10% of Multifocal IOL surgeries will require an excimer laser enhancement**
 - **Aim for +0.1 D for multifocal IOLs**
 - **No nomogram adjustment for age**
 - **Treatments are usually very small**



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Thank you.

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