PEARLS FOR SMALL APERTURE CORNEAL INLAY IMPLANTATION

PRESBYOPIA: A GROWING ISSUE

- Population Growing
- Incomes and Education Rising
- Life Expectancy Rising
- Good Uncorrected Near Vision Increasingly Important
- Largest Opportunity for Revenue Growth in the Next Decade

PROBABILITY OF PRESBYOPIA AND REFRACTIVE ERROR

Presbyopia affects most people over 40 yrs of age. Many presbyopes are also myopic or hyperopic.
TREATS A BROAD SPECTRUM OF PATIENTS

EMMETROPES  

AMETROPES  

Post-LASIK  

MONOFOCAL PSEUDOPHAKES

KAMRA™ INLAY DESIGN

- The inlay extends depth-of-focus and overcomes presbyopia by:
  - Providing an unobstructed pathway for paraxial light to reach the retina, and
  - Restricting disruptive defocused light
- Central aperture has no power

Inlay Design

- 8,400 holes (5-11 μm)
- 1.6mm Aperture
- 5 μm thick
- Made from Polyvinylidene Difluoride (PVDF)

EXTENDING DEPTH-OF-FOCUS

Young Eye

Presbyopia

With Inlay

Lens accommodate to focus near object

Lens cannot accommodate

Lens cannot accommodate
**BENEFITS OF THE SMALL APERTURE CORNEAL INLAY**

- Minimally invasive procedure
- Treatment that leaves the natural lens in place
- Complete uninterrupted range of vision
- Reliably improves near and intermediate vision while maintaining distance vision
- Refined surgical technique results in repeatable and reliable results

**AGENDA**

- Advanced Diagnostics for Patient Selection  
  - George O. Waring IV, MD
- Surgical Techniques for Optimal Outcomes  
  - Perry S. Binder, MD
- Postoperative Common Issues and Management  
  - Minoru Tomita, MD, PhD
- Tactics for Maximizing Patient Satisfaction  
  - Jeffrey Machat, MD
- Panel Discussion

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**Advanced Diagnostics for Patient Selection**

George Waring, IV, MD  
Magill Vision Center  
Charleston, SC
Stages of Presbyopia

**Early**
- Has some accommodative amplitude
- Patient reports history of reading glasses
- Still performs well on visual testing

**Functional**
- Has experienced gradual declining accommodative amplitude
- Patient is starting to feel impaired

**Absolute**
- Virtually no accommodative amplitude
- Or, monofocal pseudophakic patient
- Patient dependent on reading glasses/contacts

May not be ready
Starting to consider options
Ready for a permanent solution

Pre-Operative Testing

**Patient History**
- Ocular
- Medical

**Vision Assessment**
- UCVA (dist and near)
- BCVA
- Dry MRx
- Cycloplegic Rx
- Eye Dominance
- Cover Test
- Lensometry

**Ocular Assessment**
- AcuTarget HD™
- Slit Lamp Exam
- Pupil Size
- Topography
- Tonometry
- Corneal Diameter (WTW)
- Dry Eye Assessment
- Pachymetry
- Posterior Segment

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Objective Patient Selection Criteria

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Emmetroe/Ametrope*</th>
<th>Post-LASIK*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>45 - 65</td>
<td>45 - 65</td>
</tr>
<tr>
<td>Spherical Equivalent</td>
<td>-5.00 D to +3.00 D</td>
<td>+0.25 D to -0.50 D</td>
</tr>
<tr>
<td>Prior LASIK Correction</td>
<td>N/A</td>
<td>+3.00 D to -6.00 D</td>
</tr>
<tr>
<td>Cylinder</td>
<td>≤ 3.00 D</td>
<td>≤ 0.75 D</td>
</tr>
<tr>
<td>Pupil Size</td>
<td>≤ 6 mm</td>
<td>≤ 6 mm</td>
</tr>
<tr>
<td>Corneal thickness</td>
<td>&gt; 500 microns</td>
<td>&gt; 480 microns</td>
</tr>
<tr>
<td>Previous LASIK Flap Thickness</td>
<td>N/A</td>
<td>&lt;160 Microns</td>
</tr>
<tr>
<td>Residual bed</td>
<td>≥ 250 microns</td>
<td>≥ 250 microns</td>
</tr>
<tr>
<td>Post-Op Refraction</td>
<td>-0.75 D</td>
<td>-0.75 D</td>
</tr>
</tbody>
</table>

*Patients can also be pseudophakic.

Subjective Criteria

- Dislikes reading glasses
- Views loss of near vision as a disability
- Cosmetic and lifestyle motivated
- Easy going
- Optimistic
- Willing to participate in recovery process
- Financial means

Assessing Patient Lifestyle

How important are the following activities in your daily life?

- Reading Text
- Reading Numbers
- Working on a Computer
- Seeing your Mobile Phone
- Performing Detailed Tasks
- Driving at Night

- Very Important
- Somewhat important
- Not Important
Exclusion Criteria

- Prior corneal procedures (Except LASIK and PRK)
- Any ocular or systemic disease that is a contraindication for corneal refractive procedures including:
  - Keratoconus
  - Uncontrolled and/or severe dry eye
  - Cataracts
  - Macular degeneration
  - Corneal dystrophy or degeneration
  - Amblyopia or Strabismus
- Patients with unrealistic expectations
- Patients with psychological conditions

Advanced Diagnostic System

- The AcuTarget HD™ is based on double-pass technology specifically designed to enhance:
  - Patient Selection
  - Education
  - Treatment Centration
  - Post-op Management

Aberrometers Measure the Wavefront at This Location
AcuTarget HD™
Evaluates the Images Directly on the Retina

Quantifying Visual Quality
- The AcuTarget HD™ assesses optical scatter and provides objective measurement of visual quality
- The KAMRA inlay is indicated for presbyopic patients with a clear crystalline lens
- Evaluating patients' optical scatter preoperatively can identify early lens changes which may result in poor visual quality after inlay implantation

Treatment Centration Guidance
- Identifies and correlates unique optical landmarks to assist with inlay centration planning
  - Purkinje vs Pupil Cord Length (μm)
  - Purkinje vs Pupil Angle (degree)
  - Purkinje vs Pupil (xy distance in μm, direction)
- Confirms achieved inlay placement
- Assists with managing vision complaints post-operatively
Tear Film Assessment

Dry eye can have a significant effect on patient quality of vision and satisfaction post-op.

- The AcuTarget HD™ provides additional objective measurement of your patients:
  - Tear evaporation rate
  - Associated degradation in quality of vision from tear evaporation over time

- This information can be used to:
  - Improve patient selection
  - Minimize the influence of dry eye on outcomes
  - Inform on patient adherence to dry eye regimen

Tear Film Assessment Results

- Provided metrics:
  - Mean OSI (OSI number +/- std dev)
  - Blinks
  - Individual OSI per image

Tear Film Assessment Results

- Provided metrics:
  - Mean OSI (OSI number +/- std dev)
  - Blinks
  - Individual OSI per image
Pseudo Accommodation Results Pre-op

- Provides Pseudo Accommodation metrics:
  - Range in Diopters

Summary

- Proper patient selection is the first step to a successful outcome
- Good patient selection will include consideration for:
  - Stage of presbyopia
  - Visual quality
  - Dry eye
  - Typical refractive surgery inclusion/exclusion criteria
- AcuTarget HD is a great tool for patient assessment and management for all refractive surgery patients
  - And can help refine outcomes with the KAMRA inlay

Surgical Techniques for Optimal Outcomes

Perry S. Binder, MS
Gavin Herbert Eye Institute
Irvine, CA
Patient Selection Grid

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Emmetropé</th>
<th>Myope*</th>
<th>Hyperopé*</th>
<th>Post-LASIK*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure Type</td>
<td>N/A</td>
<td>PLK2</td>
<td>PLK2</td>
<td>PLK</td>
</tr>
<tr>
<td>Age</td>
<td>45-65</td>
<td>45-65</td>
<td>45-65</td>
<td>45-65</td>
</tr>
<tr>
<td>Spherical Equivalent</td>
<td>plano to -1.00D</td>
<td>-0.50 D to -1.25D</td>
<td>plano to +0.50 D to +0.25D</td>
<td></td>
</tr>
<tr>
<td>Pre-LASIK Correction</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>+3.00 D to +6.00 D</td>
</tr>
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<td>≤ 0.75 D</td>
<td>≤ 3.00 D</td>
<td>≤ 3.00 D</td>
<td>≤ 0.75 D</td>
</tr>
<tr>
<td>Pupil Size</td>
<td>≥ 6 mm</td>
<td>≥ 6 mm</td>
<td>≥ 6 mm</td>
<td>≥ 6 mm</td>
</tr>
<tr>
<td>Corrected Thickness</td>
<td>&gt; 500 μm</td>
<td>&gt; 500 μm</td>
<td>&gt; 500 μm</td>
<td>&gt; 400 μm</td>
</tr>
<tr>
<td>Pre-LASIK Flap Thickness</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>&lt;160 μm</td>
</tr>
<tr>
<td>Distance between LASIK flap and endothelium</td>
<td>&gt; 250 μm</td>
<td>&gt; 250 μm</td>
<td>&gt; 250 μm</td>
<td>&gt; 250 μm</td>
</tr>
<tr>
<td>Post-Op Refraction</td>
<td>N/A</td>
<td>-0.75D</td>
<td>-0.75D</td>
<td>-0.75D</td>
</tr>
</tbody>
</table>

Surgical Procedures

Pocket Emmetropic KAMRA (PEK)

Description: A pocket is created in the stroma at a depth of 200-250μm. The inlay is then inserted in the pocket.

Suitable for:
- Emmetropic Presbyopes
- (Naturally occurring or pseudophakic)

Dual-Interface Procedures:
Post-LASIK KAMRA (PLK), Planned LASIK KAMRA – 2 Step (PLK2)

Description: A LASIK treatment is performed under a 100μm flap. A minimum of 1 month later, a pocket is created 100μm under the LASIK interface, and the inlay is inserted.

Suitable for:
- Ametropic presbyopes
- Post-LASIK presbyopes

Advantages of Pocket Procedures

- Significantly improved refractive stability and predictability
- Less incidence of dry eye is associated with pocket-based procedures
- Improved patient satisfaction
- Simplified centration
- Improved healing and visual outcomes
Laser pearls

- **Femtosecond Laser Performance**
  - Femtosecond lasers are optimized for 100-110 μm resections
  - Lasers perform differently at 200 μm at 100 μm
  - Important to adjusting laser settings
  - Stromal bed quality can effect:
    - Healing
    - Visual quality and acuity

- **Excimer Laser Performance**
  - Excimer lasers and nomograms have been optimized for ablations depths between 100-110 μm

Pocket Procedures:
Uncorrected Near and Distance Visual Acuity

- On average patients achieve 20/28 (J2) for UCNVA and 20/20 for UCDVA

Pocket Procedures:
Best-Corrected Distance Visual Acuity

- 99.6% of patient had BCDVA of 20/25 or better 12 and 24 months
- Only 1.03% lost 2 or more lines of BCDVA at 24 months
Pocket Procedures: Manifest Refractive Spherical Equivalent

- Mean MRSE is -0.95 ± 0.70 at 12 months post-op
- Refraction remains stable out to 24 months

Long-Term Results: Uncorrected Near VA at 5 Years

- UCNVA improved from a mean of J8 to J2 in the inlay eye (IE) between preop and 1 month
- This result is maintained out to 5 years
- Vision in the inlay eye and with both eyes (BE) is unaffected by the progression of presbyopia
- UCNVA in the untreated other eye (OE) shows an mean loss of 1 line over the same time period

Refractive Stability

- At 12 months, 90% of patients worldwide, treated with a pocket procedure, are within ±1.00 D of their intended refractive correction
Refraction

- 92% of patients achieved 20/20 or better UCDVA and J3 UCNVA when their post-op MRSE was -0.75 D

Influence of Refraction on Acuity

![Graph showing percentage of patients achieving visual acuity goals based on refractive error]

Data from the global KAMRA Data Registry™

Post-LASIK Refractive Regression

- Myopic and Hyperopic refractive changes are a common occurrence after a laser refractive procedure:
  - Chen et al. reported that the risk of myopic regression up to 6 months after LASIK is 23%\(^1\)
  - Lin reported in JCRS in 2012 that 43.6% of patients treated with LASIK using a femtosecond laser experienced a myopic shift of 0.50 D or more by 12 months\(^2\)
  - Kanellopoulos et al reported a mean regression in hyperopes after LASIK of +0.72 +/- 0.19 D after 2 years\(^3\)

Post-Operative Management

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Topography Changes
- It is normal to see a red ring on topography and by itself should not require therapy.
- Elevation over the inlay (red ring) is influenced by:
  - Flap thickness ($r = 0.723$)
  - Time since surgery
  - Ablation type
- If a red ring is noted, perform a complete ocular assessment to rule out possible wound healing response.

Topography Maps
- Focus on the axial map as the instantaneous map can overemphasize the presence of a red ring.
- Set the axial map to 0.50 D steps.

Complaints and Complications
Significantly Reduced Wound Healing Response

- Incidence of a wound healing response using a pocket-based procedure with femtosecond laser settings at or less than 6x6 S/L is now 4-6%.
- Wound healing is characterized by:
  - Thickening over the inlay
  - Haze formation over the inlay annulus
  - Central cornea flattening resulting in a hyperopic refractive change \( \geq 1.00 \) D
- NOTE: Most patients will maintain good vision despite a refractive change.

Managing a Wound Healing Response

- When a wound healing response is first diagnosed, the patient should be started on a course of steroids and dry eye therapy (see MAB guidance).
- Of the 4-6%, approximately 80-85% resolve through use of single round of steroid therapy*
- The remaining 1-2% of patients should be considered for inlay removal.

Summary

- Pocket procedures are the state-of-the-art.
- Average vision achieved without glasses:
  - Near (UCNVA): 20/25 (J1-J2)
  - Distance (UCDVA): 20/25
- Regardless of procedure type, patients achieve the same visual acuity results by 1 month.
- One month results are maintained over the long-term.
- 90% of patients are within +/- 1.00D of intended refractive target.
- Only 1.03% lost 2 or more lines of BCDVA.
Postoperative Common Issues and Management

Minoru Tomita, MD, PhD
1) Executive Medical Director, Shinagawa LASIK Center, Tokyo, Japan
2) Adjunct Clinical Professor, Department of Ophthalmology, Wenzhou Medical College, Wenzhou, China

Shinagawa LASIK Center

Agenda – Management for
1. Myopic shift due to dry Eye
2. Myopic shift
3. Hyperopic shift
4. Haze
5. IOP
6. Recentration
7. Postoperative regimen
8. Actions for improving results
9. Important things for new surgeons
10. Surgical instruments

1. Myopic shift due to dry Eye
Remarks on refractive shift:
※ myopic or astigmatic shift
※ occasional poor best corrected VA
※ irregular TMS center in red
※ presence of SPK

How to manage dry eye:
① Insert a punctal plug at 1 day postoperative for all patients
② Make sure that patients follow dry eye prescriptions, such as Hyaluronic acid and artificial tears
③ If more treatment needed, twice a day on Restasis for 1 month
④ Observe 2 to 3 months
⑤ If no improvement, insert another punctal plug
Myopic shift due to dry eye –

**Case 1:** 45 years old Male who had CLK(SIM LASIK) in OS

- 1 Month
  - UDVA: 20/32
  - UNVA: J2
  - Midpoint MRSE: -2.00 (D)

- 3 months
  - UDVA: 20/20
  - UNVA: J1
  - Midpoint MRSE: -0.75 (D)

- 11 months
  - UDVA: 20/20
  - UNVA: J1
  - Midpoint MRSE: -1.00 (D)

Myopic shift due to dry eye –

**Case 2:** 46 years old Female who had CLK(SIM LASIK) in OS

- 1 Month
  - UDVA: 20/32
  - UNVA: J2
  - Midpoint MRSE: -1.25 (D)

- 3 months
  - UDVA: 20/20
  - UNVA: J1
  - Midpoint MRSE: -3.25 (D)

- 6 months
  - UDVA: 20/20
  - UNVA: -J1
  - Midpoint MRSE: -1.50 (D)

Myopic shift due to dry eye –

**Case 3:** 49 years old Female who had CLK(SIM LASIK) in OS

- 1 Month
  - UDVA: 20/40
  - UNVA: J1
  - Midpoint MRSE: -3.25 (D)

- 3 months
  - UDVA: 20/20
  - UNVA: J1
  - Midpoint MRSE: -2.00 (D)

- 6 months
  - UDVA: 20/16
  - UNVA: J1
  - Midpoint MRSE: -1.00 (D)
2. **Myopic shift**

- Perform dry eye treatment, such as inserting punctal plug, eye drops, and restasis and observe for 2 to 3 months
- No improvement
  - Insert another plug, perform aggressive dry eye treatment
- Improved
  - Regression still
- When the surgery is difficult
  - Consider touch-up, inform patient possible decrease in UNVA After the Kamea doctor meeting, decide the treatment method
- Perform β-blocker for twice a day

- For myopic shift, it is important first to perform the dry eye treatment. If this is not effective, perform enhancement or β-blocker.

3. **Hyperopic shift**

- Check topography for any irregularity and hyperopic shift
- TMS blue
  - Haze
- TMS normal
  - No haze
- Perform steroid regimen
- No response
  - Remove inlay
- Response
  - Tapering steroid regimen

4. **Haze**

- Remarks on refractive shift:
  - Hyperopic shift
  - Poor best corrected VA
  - TMS center in blue
  - Haze between inlay and lamellar
4. Haze – Cont.

Haze treatment depends on below cases:

<table>
<thead>
<tr>
<th>Visual Acuity</th>
<th>Haze Yes/no</th>
<th>Hyperopic Shift</th>
<th>TMS</th>
<th>Prescription</th>
<th>Next visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild case</td>
<td>Good</td>
<td>yes</td>
<td>no</td>
<td>normal</td>
<td>1 M</td>
</tr>
<tr>
<td>Moderate case</td>
<td>Good</td>
<td>yes</td>
<td>Yes</td>
<td>Blue</td>
<td>1 M</td>
</tr>
<tr>
<td>Severe case</td>
<td>Poor</td>
<td>yes</td>
<td>Yes+</td>
<td>Blue</td>
<td>2 W</td>
</tr>
</tbody>
</table>

*If no improvement is seen after Moderate case, do the treatment of Severe case.

4. Haze – Cont.

Consider explantation of inlay if below cycle are repeated 2 to 3 times.

- Steroid prescription
- Improvement
- Deterioration
- Tapering steroid regimen

4. Haze – Cont.

Haze appeared at 6 months postoperative over the inlay.

At 6 month [Image]

At 1 year [Image]
5. IOP

Increase in IOP

- Kamra implanted eye (IE) shows about 3 mmHg more IOP than the fellow eye when checked by non-contact tonometer.

IOP checked by non-contact tonometer: mean value

<table>
<thead>
<tr>
<th>n</th>
<th>Non-Contact Tonometer (NCT)</th>
<th>Pascal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Implanted eye (IE)</td>
<td>Fellow eye (Fellow)</td>
</tr>
<tr>
<td>Preop</td>
<td>13.4</td>
<td>13.4</td>
</tr>
<tr>
<td>1W</td>
<td>13.4</td>
<td>13.4</td>
</tr>
<tr>
<td>1M</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>3M</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>6M</td>
<td>13.1</td>
<td>13.1</td>
</tr>
<tr>
<td>1Y</td>
<td>13.0</td>
<td>13.0</td>
</tr>
</tbody>
</table>

- If the difference of OD and OS is within 5 → acceptable range
- If more than 5 → re-check the IOP by Pascal (Dynamic Contour Tonometry)

Comparison of IOP

- IOP value of Kamra implanted eye (IE) and fellow eye were compared using Non-Contact Tonometer (NCT) and Pascal (DCT).
- Implanted eye resulted 3 to 4 mmHg higher IOP than the fellow eye checked by NCT.
- By Pascal, implanted eye resulted 1 to 2 mmHg higher IOP than the fellow eye, this is due to steroid?

6. Recentration

Decentration

- After 1M, when there are no dry eye, no haze, but poor uncorrected/corrected VA, check with AcuTarget and perform dilated fundus exam, then decide the treatment plan at Kamra doctor meeting.

- When all the visual acuity such as BCDVA, BCNVA, UCDVA, UCNVA are poor, go to the AcuFocus Decision Tree.
6. Recentration – Cont. Case Report

- Performed recentration after 2 months due to poor distance and near visual acuity.

At 3 months:

- **Patient A** gained (from right before recentration)
  - 7 lines of UDVA from 20/100 to 20/20
  - 3 lines of UNVA from J5 to J1

- **Patient B** gained:
  - 3 lines of UDVA from 20/40 to 20/20
  - 4 lines of UNVA from J6 to J1

- Acutarget image can show the inlay position and the first Purkinje image.
- It is important to take Acutarget image at preoperative and also at 1 month. Wait at least 1 month before adjusting inlay centration.
7. Shinagawa postoperative regimens

**On the day of surgery ~ Next day check-up**
- **Dexamethason** Once every 1 hour
- **Vegamox** Once every 1 hour
- **Hyaluronic acid 0.1 %** Once every 1 hour
- **Pain killer** One drop when feeling pain

**Next day checkup ~ 1 week**
- **Dexamethason** Five times per day
- **Vegamox** Five times per day
- **Hyaluronic acid 0.1 %** Five times per day
- **Artificial tears** One drop when doing the training, also when the eye is dry

**1 week ~ 1 month**
- **Fluorometholone 0.1 %** Five times per day
- **Hyaluronic acid 0.1 %** Five times per day
- **Artificial tears** Same as above

**1 month ~ 3 month**
- **Fluorometholone 0.1 %** Three times per day
- **Hyaluronic acid 0.1 %** Five times per day
- **Artificial tears** Same as above

**3 month ~ 6 month**
- **Fluorometholone 0.1 %** Twice a day
- **Hyaluronic acid 0.1 %** Five times per day
- **Artificial tears** Same as above

**6 month ~ 1 year**
- **Fluorometholone 0.1 %** Once a day when the eye is dry
- **Hyaluronic acid 0.1 %** Same as above
- **Artificial tears** Same as above

8. Actions for improving results
- **Limit the surgeons** – Get used to the handling of inlay placement under the flap and intraoperative management. Once comfortable, move on to PLK surgery. Try to limit the number of surgeons, instead focus more on polishing their handling skills.
- **Keep cornea dry** - Pocket interface should be dry as much as possible
- **Close to the limbus** – Create the incision of the pocket interface, closer to the limbus.
- **Minimize manipulation time** - The key for the optimum outcome is to minimize the manipulation time inside the pocket interface. After inlay placement, try not to manipulate as much as possible. If needed, keep it up to 2 times.
9. Important things for new surgeons

- Operating microscope
  To obtain the best possible results, proper positioning of the Kamra inlay is important.
  ★ At Shinagawa, we use surgical microscope with a built in green LED fixation light, separated from main light source. Using LED fixation light, surgeons can easily detect the Purkinje image and determine the best position of the Kamra inlay.

9. Important things for new surgeons – Cont.

- In Shinagawa, when inserting the Kamra inlay, according to the surgeon's dominant hand and which eye will be the Kamra eye, surgeons switch positions either right or left side of the patient.

- Use surgical tools which help you – Limbus marker, inlay positioner, or guide-light for CLK and PLK.

10. Surgical instruments

Corneal Limbus Marker for previous LASIK Flap Edge (CLK)
10. Surgical instruments – Cont.

Inlay Positioner for Kamra (CLK)

Inlay Positioner for Kamra (PLK)

Handy Guide-Light for checking the flap edge with
Tactics for Maximizing Patient Satisfaction

Jeffery Machat, MD
Toronto, Canada

Key Factors to Patient Satisfaction

- Careful Patient Selection
- Diligent Counseling
  - Benefit of having the inlay myself
  - Differentiate from LASIK healing
- Aggressively manage Dry Eye pre-op, intra-op and post-op:
  - TearLab testing for everyone (my preference)
  - Punctal plugs pre-op
  - Treat any Blepharitis
  - Lubricate Heavily throughout
Key Factors to Patient Satisfaction

- Refractive target?
- Femtosecond laser?
- Inlay Centering?
- Minimal manipulation?
- Technique?
- Dry Eye Status?
- Steroid taper?
- Other factors?

Inlay Surgical Procedure

- SURGICAL PROCEDURES:
  1. PEK: Pocket Emmetropic KAMRA
  2. PLK: Post-LASIK KAMRA
  3. PLK2: Planned LASIK KAMRA – 2-Step

100% Pocket Procedures

- Faster Visual Recovery
- Less Dry Eye
- More Stable Cornea
- Ability to place Inlay deeper
- Flaps for LASIK remains at 100 microns
KAMRA™ Inlay Placement

- Target inlay placement over the 1st Purkinje
- If there is a significant difference > 400 microns between 1st Purkinje and pupil center, place inlay in between
- The guideline for inlay placement is to target within 300 microns from desired position BUT I believe needs even greater precision

KAMRA™ Inlay Centered Within Circular Marking
PLK2

- First-Ziemer femtosecond laser to create pocket at 250-270 microns
- Then Z4 for corneal flap at 100 microns after 5-15 min
- Schwind AMARIS 750s to ablate prescription

- Patient returns in 3 days for inlay insertion
- Pocket first opened at Slit Lamp
- Inlay then inserted under Tagaki Microscope

Insert the KAMRA™ inlay in a quiet eye
- Achieves a LASIK-like "Wow" factor
- Separate out the issues of distance correction and presbyopia
- Procedure times are close enough to not lose the patient

Patients are having surgery for reading vision
- Even if +0.50D, we perform PLK2 and target -0.50D, expecting an additional small myopic shift

After experimenting on myself, I now taper topical steroids over 9 months:

- Month 1: Pred Forte q2h x 48 hours, then QID for 5 days then FML 0.1% QID x 3 weeks
- Month 2: FML 0.1% BID
- Months 3 & 4: FML 0.1% QD
- Months 5 & 6: FML 0.1% Q2D
- Months 7-9: FML 0.1% Q1Week
Summary

- There has been considerable evolution to the surgical procedure for implanting the KAMRA™ inlay
- Global movement toward pocket-based procedures based on the following advantages:
  - Improved refractive stability and less dry eye
  - Improved "wow" factor
  - Simplified intraoperative centration process
- Removal rate is exceedingly low
- Post-removal eyes recover well
- This is not LASIK, but the potential for happy patients is equally powerful!