BREAKOUT SESSION: INNOVATIVE INTRAOCULAR APPROACHES TO ADDRESS PRESBYOPIA

MOTERATED BY:

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YARI MITCHELL
ACUFOCUS

STEVEN SMATHERS
PERFECT LENS

RAMGOPAL RAO
LENSGEN

MAX WOLF, MID
ALCON
The Perfect Lens Device
Examples of Technology Application

- Alter sphere, cylinder, sphere and cylinder, asphericity, add multi-focality, potentially remove multi-focality
- Works on any acrylic IOL hydrophobic/hydophilic lens
- Adjust IOL multiple times
- Correct issues caused by tilt and decentration of IOL
- No cutting or ablation of any tissue
- In-office procedure
- Takes 60 seconds or less
- Potentially corrects higher order aberrations
Enhancement of Hydrophilicity by Femtosecond Laser Excitation

Photo-induced hydrolysis of polymeric material in aqueous media:

Photo-induced hydrolysis produces two hydrophilic functional groups: acid group and alcohol group!
Area of Femtosecond Laser Focus
2D RIS Lens in IOL

IOL Before RIS

IOL After RIS

[Images of IOL before and after RIS with corresponding graphs and data]

[Images sourced from Perfect Lens]
Monofocal IOL to Multifocal

**Before**

- IOL Power (D): 5.27
- MTF @100: 0.53

**After**

- IOL Power (D): 5.25
- Add (D): 3.58
  - 51/49 split
Monofocal to Multifocal to Monofocal

Before

<table>
<thead>
<tr>
<th>Single Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Power (D): 37.78</td>
</tr>
<tr>
<td>IOL Power (D): 18.92</td>
</tr>
<tr>
<td>MTF @ 100: 0.56</td>
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</table>

1st Treatment

<table>
<thead>
<tr>
<th>Multi-focal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Position: 15</td>
</tr>
<tr>
<td>Stop Position: 25</td>
</tr>
<tr>
<td>Step (D): 0.05</td>
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</table>

<table>
<thead>
<tr>
<th>Focus 1</th>
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</thead>
<tbody>
<tr>
<td>Eye Power (D): 37.77</td>
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<tr>
<td>IOL Power (D): 18.91</td>
</tr>
<tr>
<td>MTF @ 100: 0.35</td>
</tr>
<tr>
<td>Energy: 0.62</td>
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<table>
<thead>
<tr>
<th>Focus 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Power (D): 39.65</td>
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<tr>
<td>IOL Power (D): 22.45</td>
</tr>
<tr>
<td>MTF @ 100: 0.17</td>
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<tr>
<td>Energy: 0.38</td>
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</table>

2nd Treatment

<table>
<thead>
<tr>
<th>Single Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Power (D): 37.82</td>
</tr>
<tr>
<td>IOL Power (D): 19</td>
</tr>
<tr>
<td>MTF @ 100: 0.52</td>
</tr>
</tbody>
</table>

Monofocal 19D IOL  →  Multifocal 19D IOL +3.6D add 60/40 split  →  Monofocal 19D IOL
Refractive Multifocal vs Diffractive Multifocal
Thank you
Small Aperture Optics

The IC-8 IOL is not approved for use in the United States
**True Extended Depth of Focus**

*Presbyopic patient defocus curve – KAMRA Inlay PMA (N=114)
** Binocular Target-corrected defocus curve at 6 months (N=12)
IC-8 IOL is not approved for use in the United States
Sustained Range of Vision

Mean IC-8 IOL MRSE: -0.48 D at 24 months
Mean Monofocal IOL MRSE: 0.08 D at 24 Months
The IC-8 IOL is not approved for use in the United States
Refractive Target Landing Zone

IC-8 IOL

Monofocal IOL

Multifocal IOL

Data from the European Post-Market Study on IC-8 IOL
The IC-8 IOL is not approved for use in the United States
Alignment-Free Corneal Astigmatism Correction

Cylinder Tolerance

- **UCDVA**: LogMAR 0.01, 0.06, 0.28
- **UCIVA**: LogMAR 0.09, 0.09, 0.32
- **UCNVA**: LogMAR 0.22, 0.23, 0.37

- **Less than 0.75 D (N=114)**
- **0.76 D to 1.5 D (N=25)**
- **More than 1.50 D (N=6)**

* * Indicates Statistically Significant. Data from the European Post-Market Study on IC-8 IOL

The IC-8 IOL is not approved for use in the United States
The IC-8® Intraocular Lens

- Cataract Relief
- Depth of Focus
- Quality of Vision
- Refractive Forgiveness
- Alignment Free

The IC-8 IOL is not approved for use in the United States.
OUS Commercial Utilization

- Premium Monovision
- Irregular Cornea
- Range of Vision Upgrade
- Range of Vision Rescue
- Dysphotopsia Management
- Bilateral Irregular Cornea
- Future Development

The IC-8 IOL is not approved for use in the United States
Evolving Cataract Surgery

- Monofocal: 92.3%
- Toric: 3.9%
- Presbyopia-correcting: 0.0%
- Phakic: 0.0%
- Other: 0.0%
Disrupting an Underserved Market

11% Irregular Cornea Segment*

3.9% Monofocal
3.0% Toric
0.0% Presbyopia-correcting
0.0% Phakic
92.3% Other

*Estimate based on prevalence of LVC, corneal aberrations > 0.5 microns and keratoconus and reported 2016 US IOL adoption data from the 2016 Market Scope IOL Report.
Who is the Irregular Cornea Patient?

Post-RK
David Kent, MD

Post-LASIK
Sathish Srinivasan, MD

Keratoconus
Omid Kermani, MD

Iris Trauma
Burkhard Dick, MD

The IC-8 IOL is not approved for use in the United States.
Expanding Scientific References

The IC-8® IOL

The IC-8 IOL is not approved for use in the United States.
INNOVATIVE INTRAOCULAR APPROACHES TO ADDRESS PRESBYOPIA

MAX WOLF
GLOBAL HEAD, INTRAOCULAR LENSES

OCTOBER, 2018
DISCLOSURES

• Alcon employee
• Will only discuss publicly disclosed information and products approved in the US
• Will not be sharing information or data regarding any ongoing trials
Three things need to line up to enable better presbyopia correcting solutions for patients:

- Surgeons' ability
- Clinical performance of technology
- Economics
Surgeons Ability: Next generation tools will enable new intraocular approaches, leading to better outcome and efficiency.

- Motivation
- Technical Training & Education
- Enabling Tools
- Practice Set-up & Management
- Commercial Ability

Next Generation:
- Pre-op diagnostics & planning
- Intra-op diagnostics
- Post-op diagnostics
Technology: Many correlate time of introduction with performance...

Multifocal IOLs | EDFs | Trifocal | Accommodating

Clinical Performance

Currently approved in US
Not approved in US
Technology: I see things somewhat differently...

1st gen EDFs
Multifocal IOLs

Accommodating

Trifocal

2nd gen. EDFs

Clinical Performance

Currently approved in US
Not approved in US

Alcon A Novartis Division
Technology: Expect different performances within each technology and expect overall different benefits across technologies

<table>
<thead>
<tr>
<th>2nd gen. EDF Technologies</th>
<th>Trifocal Technologies</th>
<th>Accommodating Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Different <strong>optical principles</strong></td>
<td>• Key <strong>differences</strong> in optical technologies and IOL platforms <strong>across manufacturers</strong> impacting patient benefits</td>
<td>• Multiple approaches under development</td>
</tr>
<tr>
<td>• Broad <strong>performance</strong> range (some come close to Trifocal technology, others not)</td>
<td>• <strong>Strong performances</strong> across key attributes, esp. defocus range and near VA</td>
<td>• <strong>Trifocal</strong> technology sets a <strong>high bar to beat</strong></td>
</tr>
<tr>
<td>• <strong>Targeted</strong> application</td>
<td></td>
<td>• <strong>Will come</strong> sooner than later</td>
</tr>
</tbody>
</table>

Currently approved in US
Not approved in US
THANK YOU
Broad View – IOL Market

High growth market - $3.9 B to $6.1 B - 2018-23 (12.8% CAGR)
  • Demographics
  • Emerging Economies

Emergence of “premium” market – $1.16 B to $2.80 B (8.3% CAGR)

Premium market drives profitability for the industry

PATIENTS WANT
good emmetropia, astigmatism, presbyopia and high quality optics

SURGEONS WANT
predictable outcomes, efficient surgeries, minimal follow-up

INDUSTRY WANTS
more premium products, IP protection, product platforms that address all segments of premium markets

LENSGEN IS UNIQUELY POSITIONED TO MEET ALL THESE NEEDS...

Source: Market Scope
## A Complete IOL

<table>
<thead>
<tr>
<th>ATTRIBUTE</th>
<th>SURGEON &amp; PATIENT EXPECTATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presbyopia Corrected</td>
<td>Dynamic, continuous – 2.0 D or more</td>
</tr>
<tr>
<td>✔️ Contrast Sensitivity</td>
<td>Monofocal quality</td>
</tr>
<tr>
<td>Optical Quality</td>
<td>Less halos and glare</td>
</tr>
<tr>
<td>🟢 Closer to Emmetropia</td>
<td>Stable refractions</td>
</tr>
<tr>
<td>🟢 Minimal Induced Astigmatism</td>
<td>Small incision – suture less</td>
</tr>
<tr>
<td>❌ Astigmatism Corrected</td>
<td>Excellent rotational stability</td>
</tr>
<tr>
<td>✔️ Enhanced Cataract Upgradable</td>
<td>Negligible PCO</td>
</tr>
<tr>
<td></td>
<td>Modular design for upgrade or exchange</td>
</tr>
</tbody>
</table>
# Premium IOL – Competitive Matrix

<table>
<thead>
<tr>
<th>FOCUS</th>
<th>FEATURE</th>
<th>MONOFOCAL TORIC</th>
<th>MF TORIC</th>
<th>EDoF TORIC</th>
<th>ADJUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced Cataract</td>
<td>Stable</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Negligible PCO</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Less Glare/Halo</td>
<td>✔️</td>
<td></td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Emmetrophia</td>
<td>Exchangeable/Upgradeable</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Adjustable</td>
<td></td>
<td></td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Presbyopia</td>
<td>Presbyopia &amp; Astigmatism</td>
<td></td>
<td>✔️</td>
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<td>✔️</td>
</tr>
<tr>
<td></td>
<td>Dynamic Focus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presbyopia</td>
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<tr>
<td></td>
<td>Toric</td>
<td>✔️</td>
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**Unmet Market Needs**

**Patient Needs**

**Current Technologies**
LensGen Technology

Juvene™
Curvature Changing Fluid IOL
Juvene™ – How it Works
Juvene – Dynamic and Continuous Focus

DISTANCE

INTERMEDIATE AND NEAR
Defocus Curves

No Halos and Glare for Juvene

Juvene significantly outperforms leading EDoF at near

Juvene same as leading EDoF at intermediate and distance

N = 10

66 cm

40 cm

20/20
20/25
20/32
20/40

20/20
20/25
20/32
20/40

Equivalent

3 lines improvement

Monofocal
LG
EDoF

Confidential
Stable Intermediate and Near Vision

N=10 Eyes

DCIVA  DCNVA
Standard IOL Compromises

COMPROMISES

- ELP Shift
- Rotation
- PCO
- Vitreo-retinal Tension
PATIENT BENEFITS

- Stable ELP
- Stable Refraction
- Minimal IOL Rotation
- Negligible PCO
- Less Vitreo-retinal Tension
Rotational Stability

1 MONTH

33 MONTHS
Pristine Capsules – No PCO

33 MONTHS  22 MONTHS  9 MONTHS  6 MONTHS
## Premium IOL – Competitive Matrix

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<th>JUVENE TORIC</th>
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<td>Emmetropia</td>
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<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td></td>
<td>Presbyopia</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Astigmatism</td>
<td>Monofocal, Toric, IOL</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
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</tbody>
</table>

### Unmet Market Needs

- Emmetropia: Exchangeable & Upgradeable
- Astigmatism: Monofocal, Toric, IOL

**Patient Needs**

- Emmetropia: Exchangeable & Upgradeable
- Astigmatism: Monofocal, Toric, IOL

**Current Technologies**

- Emmetropia: Exchangeable & Upgradeable
- Astigmatism: Monofocal, Toric, IOL

---

**FOCUS**

- Enhanced Cataract
- Emmetropia
- Presbyopia
- Astigmatism
Thank You
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