Multifocal IOLs
Preoperative Pearls & Pitfalls

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No Financial interest in Any Instrument / Device

I have the following financial interests or relationships to disclose:
Abbott Medical Optics: C
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Transcend Medical: C,O

What do patients want?
Reduced Spectacle Dependence?

1. 10% - like wearing glasses
2. 10% - limited BCVA
3. 15% - hate glasses
4. 2/3 – interested but depends on cost/tradeoffs

ASCRS 2013 Survey
Presbyopia Correcting IOL

Percent of current cataract procedures that involve presbyopia-correcting IOLs

- None
- 1% to 5%
- 5% to 10%
- 11% to 20%
- 21 to 40%

23.4%
32.0%
19.5%
14.5%
10.7%
Percent of current cataract procedures that involve presbyopia-correcting IOLs:

- None: 10.7%
- 1% to 5%: 23.4%
- 5% to 10%: 14.5%
- 11% to 20%: 19.5%
- 21% to 40%: 14.5%

Average % of cataract procedures that is presby-correcting IOLs is 7.9% (7% US, 9% Non-US)

Average % targeted for monovision = 18.9% (15.2% US, 23.1% Non-US)

Premium IOLs – turn offs

- Chair time
  - Explain options
  - Set expectations
- Logistics
  - Discuss fees, collect fees
- Expectations raised
  - Unhappy patients
- Selling, marketing
  - financial conflict

Presby-IOL Patient Profiles

- Older cataract patient
  - Has no accommodation
- Young cataract patient
  - Has accommodation (2nd eye phakic?)
  - Never lost accommodation
- Refractive lens exchange
  - Excellent visual quality
Presby-IOL Patient Profiles

- **Contact lens wearer**
  - Expects emmetropia

- **Monovision CL**
  - Spectacle Free
  - Large anisometropia

- **Myope**
  - Reads without glasses

Pearls – Presbyopia IOLs

- **Evaluation**
- **Patient Selection**
- **Counseling**

Multifocal IOLs compromises

- Contrast sensitivity
- Glare, halos
- Greater blur if not emmetropic
- Cost

Multifocal IOL - ideal

1. Motivated – reduce glasses
2. Healthy eyes
3. Binocular + emmetropia
4. Reasonable expectations
Who is candidate?

**Satisfaction ???**
- Cataract density
- Eyeglasses - frequency
- Occupation / Vocation
- Personality
- Motivation
  - Spectacle dependent now?

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**Healthy Eyes**

- **Cornea** (Fuchs, map/dot, HOA)
- **Macula** (ERM, AMD)
- **Disc** (Glaucoma)
- **Pupil** (ReSTOR)
- **Lens** (Zonulopathy)

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**MF: Binocular + Healthy + Emmetropia + Motivated**

- Monofixator, amblyopia
- Post-RK, LASIK
- Extreme refractive errors
- Astigmatism, corneal HOA
- Abnormal Cornea, Disc, Macula
Please place an “X” on the following scale to describe your motivation to reduce dependence on glasses:

| Prefer glasses at all times | somewhat interested | I hate glasses! |

Please place an “X” on the following scale to describe your personality as best you can:

| Easy going | Perfectionist |

Your occupation or hobbies:

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**Dell Q – for cataract practice**

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**Hard to Satisfy?**

- Personality (Dell Questionnaire)
  - Obsessive-compulsive
  - Entitlement, passive aggressive
  - Depressed

- Young patient – accommodating
- RLE
- Low myopia; monovision CL

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**Patient Counseling Pre-visit**

**PRE-EXAM** (mailed w/appt)

- General Presbyopia IOL Handout
  - Out of pocket option
  - Already decided pre-exam

- Dell Questionnaire
  - Patient can communicate

- Refer to practice website
**Screening Premium IOL Patients**

**Corneal Optical Quality?**
Topography
Measuring Corneal HOA
“irregular astigmatism”

**Macular quality**
contact lens SLE, OCT

**5 mm Pupil**

**Preop Multifocal?**

**Left Eye - ReSTOR**

**4.5 mm Pupil**

**Preop Multifocal?**

**Right Eye - Preop**

- **C:**
  - **Preop:**
  - **4.5 mm Pupil**
  - **5 mm Pupil**

- **Lens:**
  - **Total Eye**

- **Cornea:**
### Office Pre-testing

- **Prior to examination**
  - Topography / wavefront
    - iTrace
  - Biometry
    - IOL Master (500)
  - Keratometry / Auto-refractor

### Daily Frustration

- **Tell every patient**
  - poor ocular health, affordable

- **Terminology**
  - Presbyopia, accommodation, refractive error, focal distance, contrast sensitivity

- **Options**
  - multifocal & accommodating IOLs, monovision, toric IOLs, LRI, mixing IOLs, and LVC

- **Inflated expectations**
  - Internet, media, friends

### Under-Promise – Over-Deliver

- **EXAM**
  - Data available (networked)
  - MD – cost, recommendation

### Patient Counseling

- Anne, Ohio
  - "It is just unbelievable not to wear glasses!"
**Terminology**
- Presbyopia, accommodation, refractive error, focal distance, contrast sensitivity

**Audio-visual presentation**

**Options**
- Multifocal & accommodating IOLs, monovision, toric IOLs, LRI, mixing IOLs, and LVC

**Generic / customizable / modules**
- Inflated expectations (Internet, friends)

**Neutral, under-promise**
- Reduce (not eliminate) eyeglasses

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**Post visit: Patient Counseling**

**POST-EXAM**
- Multifocal IOL Handout
  - FAQ = Written informed consent
  - Review postoperatively

- Patient Book (Slack)
  - Amazon.com

**Presbyopia IOL Counseling**

**Emmetropia not guaranteed**
- Laser vision enhancement

**Variable results**
- Macula, ciliary muscle

**Reduce, not eliminate spectacles**
- Convenience, “social reading”
  - “Will probably get eyeglasses”
IOL Through-Focus Image Quality

1D corneal astigmatism, 3mm pupil

Defocus [D]:

0 1 2 3 4 5

AcrySof monofocal
Crystalens HD
ReSTOR 3D
Tecnis ZM900

Zheleznyak et al., JCRS, 2012.

LRI with MF IOL
Muftuoglu O, Dao L, Cavanagh HD, McCulley JP, Bowman RW.

ReSTOR + LRI (n = 73)  29% needed LASIK

Mean Astig:  Preop 1.49 (±0.71) D  Postop 0.56 (±0.57) D

20/25, J1 sc: 76% LRI only 81% LRI + LASIK
Astigmatism Management
Real time intraoperative aberrometry

Reduced Spectacle Dependence
1. Good "quality" vision
2. Minimal unwanted images (tradeoff)
3. Low risk
4. Affordable
Zhang F, Sugar A, Jacobsen G, Collins M. 
Visual function and spectacle independence 
after cataract surgery: bilateral diffractive 
multifocal intraocular lenses versus 
monovision pseudophakia. 
J Cataract Refract Surg. 2011 May;37:853-858

Wilkins MR, Allan BD, Rubin GS, et al. 
Randomized trial of multifocal intraocular 
lenses versus monovision after bilateral 
cataract surgery. 
Ophthalmology 2013 Dec; 120: 2449-2455

High Satisfaction
Mono – better intermediate
MF – better near
MF – more dysphotopsia

Monofocal IOL (E-DOF)
“Extended Depth of Focus”
Blended Mini-monovision