110

Secrets to Success with Contemporary Multifocal Contact Lenses

S. Barry Eiden, OD, FAAO

Room: Rhodes A

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- Alcon/ CIBA Vision – Honorarium/Consulting, lecturing, research
- Alden - Consulting, research
- Bausch + Lomb – Honorarium/Consulting, lecturing, research
- CooperVision – Honorarium/Consulting, lecturing, research
- Merck - Consulting
- Oculus - Honorarium/Consulting, lecturing, research
- Special Eyes – Honorarium/Consulting, lecturing, research
- SynergEyes - Honorarium/Consulting, lecturing, research
- Visionary Optics - Honorarium/Consulting, lecturing, research
- Vistakon - Honorarium/Consulting, research
- EyeVis*
- National Keratoconus & Dry Eye Institutes*
Secrets to Success with Contemporary Multifocal Contact Lenses

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EyeVis Eye and Vision Research Institute
National Keratoconus & Dry Eye Institutes

Assistant Clinical Professor: University of Illinois at Chicago
Department of Ophthalmology

Adjunct Faculty: Indiana, Illinois, PCO @ Salus, and UMSL Colleges of Optometry
A current global overview of presbyopic patients

- 1.04 billion people have presbyopia\(^1\)
- Over 40% of patients in today’s eye care practices are presbyopic\(^2\)

References:
2. 2010 SIS International Research Multifocal Study (commissioned by CooperVision)
• By 2020, 25% more people are expected to become presbyopic

• By 2050, the number of presbyopic patients is expected to nearly double

BUT TODAY, ONLY <10% OF PRESBYOPIC PATIENTS ARE BEING FIT WITH A MULTIFOCAL LENS¹

WHY?

Not All Presbyopes Are Alike
Contemporary Vision Demands

- Computer use (desk top, lap top, PDA etc.)
- Variable working distances & directions of gaze
- Complex and variable lifestyle demands
Considering and Discussing Presbyopic CL Modalities

• Screening your patients
• Reviewing Options
• Keys:

  Refractive status & Topography
  Ocular surface & Tear quality
  Pupil size
  Lower lid position & Vertical fissure size
  Lifestyles & Working distances
  Lighting and environment
The Role Of Monovision

Advantages

• Ease of fit
• Lens design options
• Cost
• Immediate evaluation
• Reasonable “success” (65-75%*)

*Survey of Ophthal. may-june 1996
The Role Of Monovision

Disadvantages

• Requires good “alternate suppression”

• Potential reduced binocularity

• Loss of intermediate range w/ high add powers

• Patient reluctance to concept
Monovision: The numbers don’t lie*!

- **Reduced stereopsis:**
  30 to 150 second decrease

- **Reduced contrast sensitivity:**
  #1 GPMFL, #2 SCLMFL, last MonoV

- **Decrease in binocular task performance:**
  2-6%

- **Patient preference for Mfl CL vs. MonoV:**
  Ave. 75% of subjects prefered Mfl CL’s

references available on request
The Role Of Monovision

Fitting Methods

- “Sighting” (motor) dominance*
- “Sensory” dominance*
  (aniso blur test)
- Habitually better DV eye for DV
- Environmental vision demands
- “Try the right first, then try the left”

*Ooi, Zijiang, J Am Optom Assoc, 72/3, 3/01
Why Use Multifocal C.L.’s Vs. Monovision?

• Maintains binocularity
  (stereopsis, binoc. task performance, high spatial freq. CSF, and binoc. summation)

• Potentially avoids “intermediate gap”

• Specialty lens fitting
  (practice differentiation & fee structures)
Monovision

• Best monovision patient is Emmetrope
• 85% rule:
  (CL considered successful 85%)
• Supplemental Specs (NV or DV)
• Multifocals should be first option
Multifocal Contact Lens Market: Underdeveloped

US Total Vision Correction Population¹

non-presbyopes 47%

presbyopes 53%

US Soft Contact Lens Market²

multifocal 7%

non-multifocal 93%

Multifocal Contact Lens Market: Underdeveloped vs. Spectacles

US Total Corrected Presbyopes Up to Age 64 = 63.4 Million

Awareness of multi-focal lenses among 40-55 year old current contact lens wearers is relatively low, with fewer than half familiar with multi-focal lens availability.
Are Contact Lens Wearers Interested In Trying Multi-Focal Lenses?

CLOSE TO THREE QUARTERS INTERESTED

VERY INTERESTED 44%
SOMewhat INTERESTED 30%
NOT INTERESTED 26%

Base: Wear Contact Lenses But Do Not Wear Multi-focal Lenses (n=159)
“Prescription of bifocal CL is generally considered to be difficult and the success rate is low.”

It’s all about vision
Intermediate VA better for MF
Near stereopsis better for MF
MF vision rated higher than monovision

Monovision: 3.3 ± 1.0 lenses
Multifocal: 3.3 ± 0.8 lenses

Woods J. Woods CA. Fonn D. Comparison of the simplicity of completing an initial fit of symptomatic early presbyopes with monovision and an aspheric multifocal silicone hydrogel #80089 AAOpt 2008
“Fitting a first time presbyopic correction with...MF lens required the same chair time as fitting...monovision”

Woods J. Woods CA. Fonn D. Comparison of the simplicity of completing an initial fit of symptomatic early presbyopes with monovision and an aspheric multifocal silicone hydrogel #80089 AAOpt 2008
Primary Multifocal Design Options:

• Disposable Multifocal Soft
• Custom Multifocal Soft
• Custom Multifocal GP (proprietary vs. full custom)
• Hybrid Multifocals
• Tandem and Recessed Multifocal Systems
Soft Disposable Multifocal Options
PureVision Multifocal

Front Surface Aspheric Design
(near center)

8.6mm/14.0mm

+6.00 to -10.00 in 0.25D steps

Adds:

Low up to +1.50D

High +1.75 to +2.50D
PureVision Multifocal Origins

- “Calslens”
- “Unilens”
- “Unilens EMA”
- B&L Soflens MFL

PureVision MFL

Unilens C-Vue

B&L Soflens MFL
Power Profiles: Low vs. High

Low ADD

Power gradually becomes more plus (+) towards lens center
(Increased depth of field)
1.25D
32"

High ADD

A distinct central zone of greater plus (+) power..+1.00
(Bifocal on top of increased depth of field)
(shifts location of depth of field closer for added near effect)
Step 4: Symptom Resolution

Unacceptable Visual Acuity
• 0.25D can make a significant difference in visual acuity. Re-check near and distance visual acuities with over-refraction in place.

Distance Visual Acuity Unacceptable
• If patient is wearing two low ADD lenses, add -0.25D to the dominant eye.
• If patient is wearing two high ADD lenses, add -0.25D to the dominant eye. If problem persists, then use a low ADD in the dominant eye and a high ADD in the non-dominant eye.
• If patient is wearing mixed ADDs, add -0.25D to the dominant eye. If problem persists, then use a low ADD OU.

Near Visual Acuity Unacceptable
• If patient is wearing two low ADD lenses, use a low ADD in dominant eye and high ADD in non-dominant eye. If problem persists, then add +0.25D to the non-dominant eye. If near vision is still not acceptable, use high ADD OU.
• If patient is wearing two high ADD lenses, add +0.25D to non-dominant eye.
• If patient is wearing mixed ADDs, add +0.25D to the non-dominant eye. If problem persists, then use a high ADD OU.
PureVision Multifocal

www.presbyopesinyourpractice.com
What is the patient's Manifest Refraction - OD?

(Note: For patients with less than 1.00D cylinder, provide spherical equivalent)

0.00

Cylinder: Does your patient have 1.00D or greater?

◉ Yes
◉ No

Continue ➤
PureVision Multifocal

- 49 Yo M dependent on “readers” (+2) over CL’s and frustrated
- M: OD -3.75-0.50x180, OS -4.25-0.25x170 bilateral Add of +1.50
- Initial:
  PV Mfl Low Add OU (OD -3.75 OS -4.00)
- DV: 20/20 (OD/OS/OU)
  NV: 20/25 (OD 30+, OS 30+) but “J1”
- Lenses dispensed – RTO 1 week
PureVision Multifocal

- F/U: fine DV some night glare but OK
- C/O: Poor NV – needs to use “readers” and needs bright light
- Trial: OS (non-dom) High Add -4.00
- DV: 20/20 (OD 20, OS 30+)
  NV 20/20- (OD 30+, OS 20-)
  IV 20/20 (OD 20- OS 20+)
- Patient satisfied other than very fine print and uses +1 OTC for those occasions
Air Optix Aqua Multifocal
(Alcon / Ciba)

• Center near front aspheric design
• Aspheric back surface (low e)
• Aqua moisture system
• 3 add powers

LO ADD
≤+1.00D

MED ADD
+1.25D to +2.00D

HI ADD
>+2.00D
Air Optix Aqua Multifocal

Near

Intermediate

Distance

Lens Power Profile
Smooth transition between near, intermediate and far zones.
## AIR OPTIX AQUA MULTIFOCAL

<table>
<thead>
<tr>
<th>SPHERE POWERS (D):</th>
<th>ADD POWERS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>+6.00 to -10.00, 0.25D steps</td>
<td>LO, MED, HI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATERIAL: Iotrafilcon B</th>
<th>Dk, Dk/t: 110, 138 @ -3.00D</th>
<th>DIAMETER: 14.2mm</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BASE CURVE: 8.6mm</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SURFACE: Permanent plasma treatment</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>WATER CONTENT: 33%</th>
</tr>
</thead>
</table>

### DESIGN

<table>
<thead>
<tr>
<th>CENTER THICKNESS: 0.08mm @ -3.00D</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HANDLING TINT: Blue visibility tint</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APPROVED WEARING SCHEDULE: Daily wear or up to 6 nights extended wear</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>RECOMMENDED REPLACEMENT SCHEDULE: Up to four weeks</th>
</tr>
</thead>
</table>

See how natural they feel.
86% success
In early
presbyopes
Air Optix Aqua Multifocal

Poor distance
Add minus
Poor near
Add plus
Air Optix Aqua Multifocal

Poor Distance

1. Add minus (Bilaterally)
2. Reduce Add (Unilaterally: dom eye up to +1.5 A, non dom > +1.5 A)

<table>
<thead>
<tr>
<th>SPECTACLE ADD</th>
<th>Dominant Eye</th>
<th>Non-Dominant Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to +1.00</td>
<td>LO</td>
<td>LO</td>
</tr>
<tr>
<td>+1.25 &amp; +1.50</td>
<td>MED</td>
<td>MED</td>
</tr>
<tr>
<td>+1.75 &amp; +2.00</td>
<td>MED</td>
<td>HI</td>
</tr>
<tr>
<td>+2.25 &amp; +2.50</td>
<td>HI</td>
<td>HI</td>
</tr>
</tbody>
</table>

For Unsatisfactory Distance Vision

If distance over-refraction did not improve distance visual acuity, see chart below

<table>
<thead>
<tr>
<th>SPECTACLE ADD</th>
<th>Dominant Eye</th>
<th>Non-Dominant Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to +1.00</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>+1.25 &amp; +1.50</td>
<td>LO</td>
<td>MED</td>
</tr>
<tr>
<td>+1.75 &amp; +2.00</td>
<td>MED</td>
<td>MED with additional +0.75D</td>
</tr>
<tr>
<td>+2.25 &amp; +2.50</td>
<td>HI</td>
<td>MED</td>
</tr>
</tbody>
</table>
Poor Near

1. Add Plus (Bilaterally)
2. Reduce Add (Non-dom) >= 1.75 A
3. Increase Add (Non dom) < 1.75 A

---

Air Optix Aqua Multifocal

2 For Unsatisfactory Near Vision

- Hold a +0.50 handheld trial lens before the non-dominant eye
- Re-check binocular distance visual acuity and near visual quality
- If satisfactory, dispense new distance lens power for non-dominant eye, keeping the original ADD. Remind patient to use good light when reading fine print

3 If Still Unsatisfactory, See Chart Below

<table>
<thead>
<tr>
<th>SPECTACLE ADD</th>
<th>Dominant Eye</th>
<th>Non-Dominant Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to +1.00</td>
<td>LO</td>
<td>LO</td>
</tr>
<tr>
<td>+1.25 &amp; +1.50</td>
<td>MED</td>
<td>MED</td>
</tr>
<tr>
<td>+1.75 &amp; +2.00</td>
<td>MED</td>
<td>HI</td>
</tr>
<tr>
<td>+2.25 &amp; +2.50</td>
<td>HI</td>
<td>HI</td>
</tr>
</tbody>
</table>
AOA MFL

- 62 Yo F c/o intermediate blur with mono CL
- CL Va: OD D 20/20 N 20/20 I 20/40 OU
- M: OD +1.50 DS OS +2.25 DS Add +2.25 OU
- Initial fit: AOA Mfl
  OD Med Add +1.50 OS Med Add +2.50
- VA: D 20/20 (OD 20, OS 20)
  N 20/25- (OD 30, OS 25), I 20/20 (25/20-)


AOA MFL

- C/O near blur vs. monovision (but much better Int. vision)
- OR: DV OD plan, OS pl/-025, NV OD +1.00, OS +0.75
- Trial: OS High Add +2.50 (N 20/20, but DV 20/25 distortion noted binocularly)
- Trial: OS Med Add +3.00 (N 20/20, DV 20/30-but no binoc distortion) – now 20/20 D/N/I binocularly and very satisfied!
Oasys for Presbyopia

Multizone Aspheric Design

• **Material**: senofilcon A (OASYS™)
• **Base Curve**: 8.4mm
• **Diameter**: 14.3mm
• **Dk/t**: 147
Oasys for presbyopia (fitting nomogram)

74% success

In 2 visits
Oasys for presbyopia (problem solving)

Poor distance
  SV (dist)
  Lower add (dist)

Poor near
  Increase add (near)

### Stereo Precision Select Tool

<table>
<thead>
<tr>
<th>Eye</th>
<th>ADD</th>
<th>+0.75 to +1.25</th>
<th>+1.50 to +1.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant</td>
<td>LOW</td>
<td>MID</td>
<td></td>
</tr>
<tr>
<td>Non-Dominant</td>
<td>LOW</td>
<td>MID</td>
<td></td>
</tr>
</tbody>
</table>

**Near complaint?**

<table>
<thead>
<tr>
<th>Eye</th>
<th>ADD</th>
<th>+0.75 to +1.25</th>
<th>+1.50 to +1.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant</td>
<td>LOW</td>
<td>MID</td>
<td>MID+</td>
</tr>
<tr>
<td>Non-Dominant</td>
<td>MID</td>
<td>MID+</td>
<td></td>
</tr>
</tbody>
</table>

**Distance complaint?**

<table>
<thead>
<tr>
<th>Eye</th>
<th>ADD</th>
<th>+0.75 to +1.25</th>
<th>+1.50 to +1.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant</td>
<td>ACUVUE® OASYS® Brand</td>
<td>LOW</td>
<td></td>
</tr>
<tr>
<td>Non-Dominant</td>
<td>LOW</td>
<td>MID</td>
<td></td>
</tr>
</tbody>
</table>

*Means adding a plus 0.25.
Cooper Vision Multifocals

“Balanced Progressive” Technologies

• Proclear EP
• Proclear Multifocal and XR Multifocal
• Proclear Toric Multifocal
• Biofinity Multifocal

+++ More Coming!
Proclear EP

• +1.00 Add
• Center distance
• Excellent for early presbyopia
• Excellent for modified monovision ("enhanced mono")
# Proclear EP

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>WEARING SCHEDULE</th>
<th>WATER CONTENT</th>
<th>BASE CURVE (mm)</th>
<th>DIAMETER (mm)</th>
<th>SPHERE POWER</th>
<th>MFG. PROCESS</th>
<th>REPLACEMENT SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>omafilcon A</td>
<td>Daily Wear</td>
<td>60%</td>
<td>8.7</td>
<td>14.4</td>
<td>+6.00D to -8.00D (0.50D steps after -6.50D)</td>
<td>Cast molded</td>
<td>2-week</td>
</tr>
</tbody>
</table>
Proclear & Fq. Multifocals

D = Distance center lens
N = Near center lens
Four adds: +1.00, +1.50, +2.00, +2.50
CooperVision Multifocals

<table>
<thead>
<tr>
<th></th>
<th>Proclear</th>
<th>Frequency 55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Curve</td>
<td>8.7</td>
<td>8.7</td>
</tr>
<tr>
<td>Diameter</td>
<td>14.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Lens Types</td>
<td>D, N</td>
<td>D, N</td>
</tr>
<tr>
<td>Power</td>
<td>-6.00 to +4.00</td>
<td>-6.00 to +4.00</td>
</tr>
<tr>
<td>Add</td>
<td>+1, 1.5, 2, 2.5</td>
<td>+1, 1.5, 2, 2.5</td>
</tr>
<tr>
<td>Material</td>
<td>Omafilcon 62%</td>
<td>Methafilcon 55%</td>
</tr>
<tr>
<td>Dk</td>
<td>33</td>
<td>18</td>
</tr>
<tr>
<td>CT</td>
<td>.16 (-3.00/+2.00)</td>
<td>.16 (-3.00/+2.00)</td>
</tr>
</tbody>
</table>
## Proclear MF XR

<table>
<thead>
<tr>
<th></th>
<th>Water Content</th>
<th>BC</th>
<th>DIA</th>
<th>Sphere</th>
<th>ADD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proclear Multifocal</td>
<td>62%</td>
<td>8.7</td>
<td>14.4</td>
<td>+4.00 to -6.00 (0.25 steps)</td>
<td>+1.00, +1.50, +2.00, +2.50</td>
</tr>
<tr>
<td>Proclear Multifocal XR</td>
<td>62%</td>
<td>8.7</td>
<td>14.4</td>
<td>+20.00 to -20.00 (0.50 steps after +/- 6.50)</td>
<td>+1.00, +1.50, +2.00, +2.50 +3.00, +3.50, +4.00</td>
</tr>
</tbody>
</table>
Proclear MF Toric

The lens is a double slab off back toric with markings at 3 & 9 o’clock

D LENS: DOMINANT EYE  N LENS: NON-DOMINANT EYE
# Proclear MF Toric

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Omafilicon A</td>
</tr>
<tr>
<td>Wearing Schedule</td>
<td>Monthly DW</td>
</tr>
<tr>
<td>Water content</td>
<td>62%</td>
</tr>
<tr>
<td>Base Curves</td>
<td>8.4, 8.8</td>
</tr>
<tr>
<td>Diameter</td>
<td>14.4</td>
</tr>
<tr>
<td>Sphere Powers</td>
<td>+20.00 to -20.00 (-0.50 steps after +/- 6.50)</td>
</tr>
<tr>
<td>Cylinder Powers</td>
<td>-.75 to -5.75</td>
</tr>
<tr>
<td>Axis</td>
<td>5° around the clock</td>
</tr>
<tr>
<td>Add powers</td>
<td>+1.00 to +4.00 (.50 steps)</td>
</tr>
<tr>
<td>Lens Design</td>
<td>N lens, D lens</td>
</tr>
</tbody>
</table>
**Biofinity Multifocal**

- **Balanced Progressive**
- **Built upon Biofinity lens material (comfilcon A)**
- **Available in a full range**

<table>
<thead>
<tr>
<th>Product specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biofinity multifocal lens</strong></td>
</tr>
<tr>
<td>Sphere power</td>
</tr>
<tr>
<td>ADD power</td>
</tr>
<tr>
<td>Lens design</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Water content</td>
</tr>
<tr>
<td>Base curve</td>
</tr>
<tr>
<td>Diameter</td>
</tr>
<tr>
<td>Dk</td>
</tr>
<tr>
<td>Handling tint</td>
</tr>
</tbody>
</table>
**Biofinity® multifocal lens**

• Simple steps to increase success at the initial multifocal lens fitting visit

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Start with a new refraction and verification of eye dominance (fogging technique)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Select the distance prescription based on spherical equivalent corrected for the vertex distance. Choose D or N lens design based on needed ADD power:</td>
</tr>
<tr>
<td></td>
<td><strong>ADD</strong></td>
</tr>
<tr>
<td></td>
<td>+1.00</td>
</tr>
<tr>
<td></td>
<td>+1.50</td>
</tr>
<tr>
<td></td>
<td>+2.00</td>
</tr>
<tr>
<td></td>
<td>+2.50</td>
</tr>
</tbody>
</table>

**Clinical tips**

- Prescribe maximum plus power for distance vision.
- Choose the lower ADD power when possible; not necessary to overprescribe the ADD power.
- Test patient's near functional vision with their cell phone.
- Check visual acuity with room lights on.

Step 3

- Allow patients to adapt to lenses for 15 minutes before assessing vision.
- To improve distance vision add −0.25 D to the dominant eye.
- To improve near vision add +0.25 D to non-dominant eye.
Cooper Multifocals
Coming Soon:
• ProClear Multifocal Daily Disposable
• Biofinity Toric Multifocal
BIOFINITY MFL

- 56 Yo F wearing PC Mfl fit elsewhere: OD “D” -175/+2 add, OS “N” -3.00/+2 add
- C/O blur at all distances and out of balance
- CL Va: D 20/25- (OD 25-, OS 40-), N 20/25+ (OD 40+, OS 25+), I 20/25 (OD 30, OS 25)
- M: OD -1.50-0.50x20, OS -3.00 DS, Add +2 OU
- **Trial**: Biofinity Mfl OD “D” -1.50/+2 add, OS “D” -3.00/+2 add
- Va CL: D 20/20 (OD 20-, OS 20) – not clear DV N 20- (OD 20, OS 25+), I 20/20 (OD/OS/OU)
BIOFINITY MFL

• **Trial**: BFM: OD “D” -1.75/+2 add OS no

• Now clear DV 20/20, but not clear enough @ NV (20/20-, OD 25, OS 25+)

• **Trial**: BFM OS “D” -3.00/+2.50 add

• Va CL: D 20/20 (OD 20, OS 25+), N 20/20 (OD 20-, OS 20), I 20/20 (OD, OS, OU)
<table>
<thead>
<tr>
<th></th>
<th>UltraVue 2000</th>
<th>UltraVue 2000T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Curve</td>
<td>8.3, 8.6, 8.9</td>
<td>8.3, 8.6, 8.9</td>
</tr>
<tr>
<td>Diameter</td>
<td>14.4</td>
<td>14.4</td>
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<tr>
<td>LensTypes</td>
<td>D, N</td>
<td>D, N</td>
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<tr>
<td>Sph Power</td>
<td>-20.00 to +20.00</td>
<td>-20.00 to +20.00</td>
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<tr>
<td>Cyl Power</td>
<td>-.75 to -6.00</td>
<td>-.75 to -6.00</td>
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<tr>
<td>Axis</td>
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<td>1º around the clock</td>
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<tr>
<td>Add</td>
<td>+1.00 to +4.00</td>
<td>+1.00 to +4.00</td>
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<tr>
<td>Material</td>
<td>Omafilcon 59%</td>
<td>Omafilcon 59%</td>
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<tr>
<td>Dk</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>CT</td>
<td>.16 (-3.00/+2.00)</td>
<td>.16 (-3.00/+2.00)</td>
</tr>
</tbody>
</table>
Custom Hydrogel Multifocals

• Sphere, Cyl. (+/- 0.12D), Axis (1 degree)

• BC, TD, PC, CT, OZ
  (fitting nomograms based on corneal sagittal height)

• Designs: Aspheric (ant vs. post), Concentric
  (distance vs. near center), Translating,
  Combination designs, control over “zone sizes”

• Materials: hydrogels and now SiHy’s
Custom Hydrogel Multifocals

- Alden
- Art
- Special Eyes
- Visionary
- Unilens
- United
- Blanchard
- Metro
- Gelflex
- Westcon
- Poyvue
- +++
The case of: “I’m not typical”

- 37 yom
- History of contact lens failures in fitting (poor vision stability w/SCL, poor comfort w/GP)
- Spectacles not convenient nor cosmetically desirable
- Cornea too thin for refractive surgery (apx. 480 microns OU)
“I’m not typical”

• **Refraction:**
  - OD – -2.25/-4.00 x137
  - OS - -1.75/-3.25 x 35
  - Add: +2.00
  - Pupil: 3.7/5.0 (rm/dark)
  - Dom Eye: OD

• **Corneal Diameter:**
  - 12.40

• **Automated K’s:**
  - OD – 44.25/47.75@44
  - OS - 44.50/47.37@120
• **Lens Diameter:**
  – 3mm + 12.40 = 15.4mm

• **“Effective-K”***:
  – OD: 44.25 + 2D = 46.25 (7.3)
  – OS: 44.50 + 2D = 46.50 (7.25)

• **Base Curve:**
  – OD: .3 + = 7.60   OS: .3 + = 7.55 (7.60)

• **Vertexed powers:**
  OD -2.25-3.50x137/+2.00A   OS -1.75-4.75x35

• **Multifocal Design:**
  center distance OD, center near OS, multizone aspheric back toric
• **Lens Ordered:**
  – “AlterVision-M” (hioxi 54%)
  – **BC:** 7.60
  – **TD:** 15.40
  – **Vertexed powers distance**
  – **Add OD +1.50 OS +2.00**
  – **Zone OD 2.3 (center distance)**
  – **OS 1.8 (center near)**
“I’m not typical”

**Outcomes:**
- OD – distance 20/25- (SCOR plano) + ghosting, near 20/30+
- OS – near 20/20 (SCOR plano), dist. 20/30+

**Remediation:**
- No change to OS lens
- Increase zone size to 2.6mm OD
- Outcome: distance OD 20/20-, much less ghosting, (near 20/40) – Binocularly Good D/N/I
Multifocal & Multifocal Toric

- Center-near, simultaneous vision multifocal
- Multi-aspheric front surface
- 2 zone sizes
- Spectacle Refraction, Keratometer Readings, & Horizontal Visible Iris Diameter (HVID)
- Definitive SiHy Material (Dk 60, Modulus 0.39)
Gas Permeable Multifocal CL’s

- Premier Optics
- Proprietary and Custom Designs
- Aspheric (ant/post), Concentric, Translating*, Combination designs
- Ability to fit on irregular corneas (keratoconus, post surgical, etc.)
Gas Permeable Multifocal CL’s

- Reclaim (Blanchard)
- Renovation (Art)
- Essential (Blanchard)
- Boston MultiVision (Polymer Tech.)
- Tangent Streak series (Fused)
- Solution & Essential Solution (X-Cel)
- Bi-Expert (Polymer Tech.)
- Rose K + front add
- RSS + Reclaim Mfl.
- +++
Multifocal GP Options

- **Alternating - Translating**
- **Concentric**
- **Aspheric**
- **Combination**
Alternating – Translating CL Designs
1. Lid position
2. Corneal diameter
3. Pupil size and dynamics
4. Fissure width
5. Lower lid to inferior pupil edge

Ocular Evaluation
Alternating - Translating Multifocal CL Designs

Advantages

• *Clearest vision D & N* *(when fits)*

• *Traditional concept to patients*

• *High add power options* *(without sacrificing DV)*
Alternating – Translating Multifocal CL Designs

**Disadvantages**

- **Complex fitting**
  (multiple parameters)
- **Rotation & translation px’s**
- **Dependence on lid anatomy**
- **Gaze dependent**
- **Intermediate loss w/ higher adds**
Alternating - Translating Designs

Patient Selection

• Lower lid @ or above inf. limbus
• Adequate lid tension
• Habitual lenses Not High Riders*****
• No primary gaze near demands
• High vision demander
• High add requirement
Alternating – Translating GP CL Designs

Trouble Shooting

• Low Positioning
• High Positioning
• Segment Position & Rotation
• Translation Issues
• Comfort Issues
• Intermediate Vision Issues
Concentric / Annular Multifocal CL Designs

Advantages

• Easier fitting
• Independence of gaze direction
• RGP and hydrogel options
Concentric Multifocal CL Designs

Disadvantages

• *Image rivalry D vs. N* (3-D, ghosting, haze, blur)

• *Centration is critical*

• *Highly pupil size dependent*

• *Intermediate vision loss with higher adds*
Concentric Multifocal Designs

**Patient Selection**

- Avenue pupil size (3-5mm)
- Patients who are not as visually critical
- Patients with lower adds
- Patients with limited intermediate vision demands
Concentric Multifocal CL Designs

Egs. of Design Availability's

- Menicon Bifocal (Menicon) - RGP
- +++ numerous GP and custom SCL
Concentric Multifocal CL Designs

Trouble Shooting

• Centration Issues

• Ghosting (D, N, both) & 3D

• Inadequate Near, Distance, Intermediate

  □ Use of different center zone sizes OD vs. OS to accentuate pt. needs (DV vs. NV)

  □ Use of “D” and “N” centered designs

  □ Use of “combination” designs
Aspheric Multifocal CL Designs

Advantages

• Full range multifocal function
• Gaze independence
• Ease of fit
• Relative ease of adaptation from conventional c.l. designs
Aspheric Multifocal Designs

Basic Aspheric Concepts

- Eccentricity
- Prolate vs. Oblate surfaces
- Mechanisms of action in multifocals
Aspheric Surfaces... Basic Principles

**Eccentricity**

(“e-value”)

The mathematical description of the rate of change of curvature of a surface. The higher the eccentricity value, the greater is the rate of change of surface curvature.
Aspheric Surfaces... Basic Principles

- **Ellipse** - e-value < 1, >0
- **Parabola** - e-value = 1
- **Hyperbola** - e-value > 1
- **Circle** - e-value = 0
Aspheric Surfaces...
Basic Principles

- **Prolate** - surface flattens away from the apex
- **Oblate** - surface steepens away from the apex
- **Spherical** - consistent curvature along the surface
**Posterior Aspheric Multifocal Fitting**

Fit significantly “steeper than K”
For multifocal effect
(up to 3D depending on e-value)
Aspheric Multifocal CL Designs

Disadvantages

• **Limited add effect** (esp. with front aspheric GP’s and all hydrogels)

• **Aspheric image degradation** (simultaneous vision)

• **Px’s with extreme pupil sizes**

• **Corneal Molding with posterior Aspheric RGP’s**
Aspheric Multifocal Designs

Posterior Surface Aspherics

- **Center DV with progressive NV towards periphery of optic zone**

- **RGP’s**: Boston Multivision, Unilens/Unilens plus GP, VFL-3, Essential GP, VX, +++ / Customs
Aspheric Multifocal CL Designs

Anterior Surface Aspherics

- Center NV with progressive DV towards periphery of optic zone

- RGP’s: Crystal Vue, Unilens Anterior RGP Multifocal, Consta-Vu, ++

+ Combination Ant./Post. Aspherics
Aspheric Multifocal Designs

Trouble Shooting

• Centration
• Limited Add Effect
• Corneal Molding
Aspheric MFL

- 50 Yo M w/ Kcns wearing GP lenses for 30 years, using OTC +1 and c/o near blur

- Current Status: CL apical touch -2, central position. Mild central stromal scar OU, CL VA 20/25 OD, 20/30 OS

- NV over CL: +2 add OU 20/20-

- Pentacam: central cone OU
Aspheric MFL

- Design custom posterior aspheric GP

- BC: 2.5 D steeper vs. well fit standard GP that demonstrated mild apical clearance (initial Dx fit with Rose K lenses - OD 6.30 OS 6.20)

- XO / BC 6.05, 5.97 / TD 9.5 / OZ 7.2 / 2nd 8.5 / 3rd 10.0, 4th 11.0 / Power adj. per OR & BC Posterior E = 1.0
Aspheric MFL

- Fit: apical clearance Tc+ OU, centered, +2 mv’t.

- Va CL: Distance OD 20/25+ OS 20/30-
  Near OD 20/30-, OS 20/30+ OU 20/25-

- Over-refractions:
  - Distance
    OD plano 25+ OS +0.50-1.00x70 25+
  - Near OD +0.75 20- OS +0.50 20
Aspheric MFL

• Modifications:
  – Increase e-value to 1.2 OU
  – Steeper BC OS 0.10 OU
  – OS Anterior Toric w/ 1.5 PD BD

• Outcomes:
  – DV OD 20/25+  OS 20/25  OU 20/20-
  – NV OD 20/20-  OS 20/25+  OU 20/20-
Combination Design GP Multifocal CL’s (concentric/aspheric)

- **Reclaim GP** *(Blanchard)*
- **Renovation & Ren-E GP** *(Art Optical)*
Hybrid & Combination Multifocals

- SynergEyes M
- SynergEyes Duette M
- Piggyback GP/disposable systems
- Recessed Pillow Lens Systems ("RPLS" – Fusion and EyeVis Technologies)
SynergEyes “M” & Duette Multifocals
Hybrid and Recess Lens Multifocal CL Systems

- SynergEyes “M” annular bifocal hybrid
- Synergeyes Duette aspheric multifocal hybrid
Synergeyes “M” annular Bifocal Hybrid CL

- Paragon HDS 100 GP Center (Dk 100)
  - 8.4 mm rigid center
  - 14.5 mm overall diameter
  - 7.8 mm optic zone
- 27% Water Non Ionic Skirt
- 10 Base Curves
  - 7.1 – 8.0 in 0.1mm steps
- 2 Skirt Curves
  - 1.0mm (steep) and 1.3mm (flat)
- 2 Segment Sizes
  - 1.9 and 2.2 mm
- 3 Add Powers
  - +1.25, +1.75, +2.25
- Sphere Powers from +4.00 to -9.00 D
“EyeVis” Fitting Method:
Fit BC .50 steeper than “Mean-K”

NaFl flowing through evenly

Sagittal height optimization

Movement is Key!

Davis, Eiden, Hybrid Contact Lens Management, CL Spectrum 4/10
Need the right Skirt Curve

- If the skirt is too steep it will limit the amount of tearflow and movement: illustrated by compression
- End result: tight lens syndrome (or ARES)

“Flattest lens without lift off or fluting”
Recessed Pillow Lens System ("RPLS")

- In development
- **Materials:** ocufilcon, methafilcon, hioxifilcon – future SiHy & molded
- Recessed anterior surface
- **Advantages:** centering and comfort
- **Indications:**
  - Irregular corneas
  - **Multifocal GP** (aspheric, concentric, and translating)
  - Regular corneas (spherical and toric)
Fitting Multifocals
“The Multifocal Decision”

- Case History
- External evaluation
- Refractive evaluation

Lens Selection
- Patient selection
STEP #1 – PATIENT SELECTION

Identify patient’s expectation

Match visual needs and personal disposition

Occupation / Avocation / Vision Demands

Refractive Error considerations

Ocular Surface & Tear film status

Systemic and ocular health & medications
WHY CONSIDER EXPECTATIONS?

Vision requirements – hairsplitter?

Comfort requirements – “whiner”?

Convenience requirements

Cost requirements – “I want it all for nothing”

20/… happy:
“It’s not perfect but it works for me”
WHY CONSIDER EXPECTATIONS?

Failure defined

Doctor did not prepare patient for limitations
Doctor over-promised results
Doctor did not adequately bill: re-time, materials, aggravation
Patient expected fitting to be quick and easy
Patient expected vision better than bifocals glasses
Patient expected CL’s to be cheaper than bifocal glasses
“PSYCHO-PREPARATION”

• Explain presbyopic condition
  Need informed and cooperative subject

• Explain the fitting procedures
  Need patient to be prepared for the experience

• Explain fees, options, and refunds
  Need to get adequately paid for efforts
LENS SELECTION

Categorize lenses by how they perform in your hands:

• Get experience with each
• You can’t take the rep’s word for it
• Be prepared to improvise… There are no textbook cases
LENS SELECTION

Categorize lenses by performance

- Certain lens designs favor better distance VA
- Certain lens designs favor better near VA
- Certain lenses deliver higher near add
- Certain lenses perform better for “dry eye” patients
LENS SELECTION

Match lens performance to patient requirements

- Options for > distance requirements:
  - Use lenses with larger distance zones
  - Dominant eye Lower add, other Higher add
  - Both eyes fitted with “D” lenses
  - Cut add in dominant eye
  - SV distance lens in dominant eye
LENS SELECTION

• Match lens performance to patient requirements

• Options for > near requirements:
  • Maximum distance plus and add both lenses
  • High Add both eyes
  • Full add D lens + full add N lens
  • Full add D lens + push distance plus N lens
  • Both eyes fitted with N lenses
  • Full add dominant eye + SV mono NV
  • Best mixed balance M/F + low near glasses over
LENS SELECTION

Always Try To Maintain Binocular Equality at Distance and Near if at all Possible:

• Equal Adds
• Same Design OD/OS
• Same Zone Sizes OD/OS
• Etc.
• However often this is not possible……
“Only 17%...prescribed binocularly...Biasing...is more likely to increase success.”

Establish Bias if needed:
“Mono-Plus/Mono-Minus”
(one eye bias distance one eye bias near)
Often you have to:
Establish Dominance
Dominance

Sighting dominance
Swinging-plus test
(sensory dominance)
Near point of convergence
Occupational demands
Dominance

Sighting dominance
Sensory Dominance
(“Swinging-plus test”):
  Hold +1.50 D (or likely add) trial lens over one eye
  Walk around room
  Most comfortable = near eye
Gromacki S. Monovision and bifocal CL. In: M. Hom A. Bruce eds. Manual CL Prescribing and Fitting 3e 2006;Elsevier
“VA is not improved when eye dominance is used...for selection”

Gromacki S. Monovision and bifocal CL. In: M. Hom A. Bruce eds. Manual CL Prescribing and Fitting 3e 2006;Elsevier
“Switching eye function can relieve...even the vaguest of symptoms”

Gromacki S. Monovision and bifocal CL. In: M. Hom A. Bruce eds. Manual CL Prescribing and Fitting 3e 2006;Elsevier
Optical mixture pyramid

No pure multifocal vision at all times
Mixture of monovision, simultaneous and alternating vision

Optical mixture pyramid

Rules

Golden rule

“If patients experience good distance vision, they will wear their lenses in. If they don’t, they will carry their lenses in.”

SynergEyes Multifocal Practitioner Training
Rules

Four days

81 presbyopes
4 multifocals
(Acuvue BF, Focus Progressives,
Proclear MF, SofLenses MF)
4 days

Rules

Four days

Log MAR: hi/lo light; hi/lo contrast
Distance, intermediate, near
Stereopsis
MNREAD (reading speed)
Subjective assessments (comfort, ghosting, visual quality, satisfaction)

At 4 days:
Differences stereopsis and near range of clear vision
Satisfaction, comfort, visual quality
Ghosting, halos decreased

Pupils
Pupils

“Pupil sizes are important, especially in the relative extremes”

Davis RL. Eiden SB. A rational approach to fitting multifocal lenses. CL Spectrum 2010 Feb 36-43,47.
Pupils
(in simultaneous multifocals)

Large pupils:
Distance compromise in center distance
Near compromise in center near

Small pupils:
Distance compromise in center near
Near compromise in center distance

Davis RL. Eiden SB. A rational approach to fitting multifocal lenses. CL Spectrum 2010 Feb 36-43,47.
Line of Sight
(angle Kappa)
may influence vision performance in distance vs. near center simultaneous multifocals
4 possible outcomes after initial fitting:

- Good vision far and near (no change)
- Poor distance
- Poor near
- Poor intermediate
- Poor distance and near
Lighting conditions

Low contrast, Normal light 3 letter loss
High contrast, Low light 3.32 letter loss
Low contrast, Low light 6.1 letter loss

Sanders E. Wagner H. Reich LN. Binocular distance visual acuity in “balanced progressive” simultaneous vision bifocal contact lenses #075165 AAOpt 2007
Procedure

Over-refraction
Auto-refractor
Push plus
Dist/near/intermediate vision
Sit in front of computer
Change room illumination
Use loose trial lenses to refine
Dispense lenses
Follow-up 4 days
<table>
<thead>
<tr>
<th>Resultant</th>
<th>Air Optix MF</th>
<th>Oasys Presbyopia</th>
<th>PureVision MF</th>
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<tbody>
<tr>
<td>Poor Distance</td>
<td>1. Over-refraction</td>
<td>Lo-SV (dist)</td>
<td>Add minus (dist)</td>
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<tr>
<td></td>
<td>2. Lower Add</td>
<td>Hi-Lower Add (dist)</td>
<td></td>
</tr>
<tr>
<td>Poor Near</td>
<td>1. Add plus (near)</td>
<td>Increase Add (near)</td>
<td>Increase Add (near)</td>
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<td></td>
<td>2. Increase Add</td>
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<td>Poor Dist &amp; Near</td>
<td>Over-refraction</td>
<td>N/A</td>
<td>Over-refraction</td>
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<td>Bias</td>
<td>Low Spect Add</td>
<td>High Spect Add</td>
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<tr>
<td></td>
<td>+1.00 +1.50</td>
<td>+1.75 +2.50</td>
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<td>Distance</td>
<td>1. Proclear EP</td>
<td>1. 2xD lenses Proclear (best distance vision)</td>
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<tr>
<td>Intermediate</td>
<td>PureVision MF</td>
<td>PureVision MF</td>
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<td>Any aspheric MF</td>
<td>Any aspheric MF</td>
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<tr>
<td>Near</td>
<td>1. PureVision MF</td>
<td>1. 2xN Proclear</td>
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<td>2. Freq 55/Proclear</td>
<td>2. GP MF</td>
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<td>Toric</td>
<td>1. Proclear toric MF</td>
<td>1. GP MF</td>
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<td>2. Custom designs</td>
<td>2. Custom designs</td>
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<td></td>
<td>3. Monovision (MV)</td>
<td>3. Synergeyes</td>
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<tr>
<td></td>
<td>4. Modified MV</td>
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</tbody>
</table>
CLMFL’s work for 75-80% of the time
Over glasses sometimes needed
0.25 D change can be significant
Don’t over-minus
Bias low add
Use mixed adds

Davis RL. Eiden SB. A rational approach to fitting multifocal lenses. CL Spectrum 2010 Feb 36-43,47.
Spectacles

27 subjects
PAL (Varilux Comfort) vs MF
11% preferred PAL
11% preferred MF
78% preferred both

Neadle SW. Ivanova V. Hickson-Curran SB. Situational vision correction preference in presbyopes #95858 AAOpt 2009
Spectacles

PAL: stationary precise vision
MF: social and active activities

Neadle SW. Ivanova V. Hickson-Curran SB. Situational vision correction preference in presbyopes #95858 AAOpt 2009
Spectacles

“Benefits of PALs and MF…[are] complimentary”

Neadle SW. Ivanova V. Hickson-Curran SB. Situational vision correction preference in presbyopes #95858 AAOpt 2009
Spectacles

“Clinicians can better satisfy their presbyopic patient’s needs by prescribing both PALs and MF”

Neadle SW. Ivanova V. Hickson-Curran SB. Situational vision correction preference in presbyopes #95858 AAOpt 2009
Keys To Success With Multifocal Contact Lenses

• “Have the tools”
  • Lenses to maximize vision
  • Lenses to maximize “comfort”

• Patient selection - motivation and realistic expectations

• Design combinations & unilateral fits

• “Mono-plus” & “Mono-minus” (modified “stereovision”)
Thank you!