Multifocal Contact Lenses
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Disclosures

- Barnett Disclosures
- Acculens
- Alcon
- Aiden Optical
- Allergan
- CooperVision
- Vistakon

- Lampa Disclosures
- Alcon
- Bausch + Lomb
- Contamac
- SpecialEyes
- Valley Contax
- Vistakon

The Presbyopic Patient Population Continues to Grow

Presbyopes will be the largest patient segment by 2016 and will continue to grow.
91% of contact lens wearers age 35 to 55 are committed to continuing with wearing contact lenses.²

Slide courtesy of Alcon
Yet Contact Lens Usage Drops Off Dramatically With Age

Presbyopia contributes to patient dropout from contact lenses starting around age 40-5.

Presbyopic contact lens dropout rate by age

93% of presbyopes were not wearing multifocal lenses at dropout

Considerations When Fitting Presbyopes

Set Realistic Expectations
- Discuss practical vision expectations
- Explain the progressive nature of presbyopia
- Discuss multifocal lens technology – provides simultaneous vision
- Multifocal contact lenses may satisfy about 90% of visual needs
- Explain monovision advantages and disadvantages

Considerations When Fitting Presbyopes

Refraction
- Push plus at distance
- Evaluate each eye monocularly to make sure not overminusing
- Demonstrate binocular vision
- Demonstrate distance, mid-range and near vision in free space binocularly
Considerations When Fitting Presbyopes

• Dominant eye
  – Determine dominant eye
  – Helpful for multifocal contact lens fits as well

• Extend both arms, brings both hands together to create a small opening.
• Eye chosen to view object is the dominant eye.

• Or +1.50 trial lens in front of each eye.
• Acceptance is the non-dominant eye.

Considerations When Fitting Presbyopes

• Use the fitting guide provided by the manufacturer

• Increases your chance of success
• Can significantly reduce chair time
• If you get stuck, take advantage of company consultants

Considerations When Fitting Presbyopes

• Keratometry / topography

• Useful to determine a starting point for contact lens fitting
• Evaluate the difference in corneal toricity and astigmatism on manifest refraction
• Topography useful to determine any corneal irregularities
• Topography also helpful to evaluate for ocular surface disease
Considerations When Fitting Presbyopes

- Ask questions about daily activities
- Computer use? If so, how many hours / day?
- Hobbies?
- Sports?
- Water sports?
- Drive at night?
- Motivation to wear contact lenses?

Considerations When Fitting Presbyopes

- Lifestyle
- What is the desire to wear contact lenses?
- Part time?
- Full time?
- Social occasions or work?
- Specific visual needs when wearing contact lenses?

Considerations When Fitting Presbyopes

- Previous contact lens history?
- Tried monovision or multifocal lenses previously?
- Previous failures / success stories and why.
Considerations When Fitting Presbyopes

- Head to head crossover studies
- Compare both soft and GP multifocal lenses to monovision
- 70% preference for multifocal contact lens correction

Considerations When Fitting Presbyopes

- Woods 2009
- Patients preferred visual acuity with multifocal lenses over monovision lenses for most activities
- Even if visual acuity was better with monovision than multifocal contact lens correction
- Activities included
  - Driving (day and night)
  - Watching TV
  - Changing focus from distance to near

Considerations When Fitting Presbyopes

- Near vision in low light
- Inform patients of this
- Use additional light
- Use additional magnification
- iRead app can provide both
Corneal Mapping over the Contact Lens

Corneal Mapping over Air Optix MF 8.6/14.2 -3.00 (High Add)

Corneal Mapping over Purevision MF 8.6/14.0 -3.00 (High Add)
Corneal Mapping over
Acuvue Oasys MF 8.4/14.3 -3.00 (High Add)

Corneal Mapping over
Proclear MF 8.7/14.4 -3.00 (+2.50 Add)

Proclear MF 8.7/14.4 -3.00 (+2.50 Add)
Corneal Mapping over Proclear MF 8.4/14.4 -3.00 (+2.50 Add)

Further Investigation
Pete

• 49 year old Caucasian male
• Presented for a contact lens examination
• Complains that it is difficult to walk around in visually demanding places like a bookstore
• Now needs bifocals but would like to continue wearing contact lenses

• Current contact lenses correct for distance
• Unable to read
• Medical history – negative
• Does not take any medications currently
• Ocular history
• Astigmatism

• Graduate Student
• Computer 8-10 hours / day
• Has worn contact lenses for 25 years
• Currently wearing a 4 week replacement lens
• Not interested in wearing glasses full time
Pete

- Contact lens history
- Average wearing time – 5-8 hours / day
- Wearing time today – 5 hours
- Solution – Clear Care
- Replacement frequency – every 3 months
- Age of current lens – 4 weeks
- Extended wear – no

Pete

- Entering VA with current contact lenses
- Air Optix for Astigmatism 8.7 /
  OD 0.50 - 1.75 x 160
  OS 0.25 - 1.75 x 010

OD DVA 20/70 NVA J5 PH 20/25
OS DVA 20/70 NVA J1+ PH 20/25

- CL fit – well centered and good movement
- 10 degree temporal rotation OU

Pete

- Keratometry
  OD 42.50 / 44.75 @ 082
  OS 44.50 / 44.75 @ 090
  D 0 each eye

- Manifest refraction
  OD -2.75 + 1.75 x 079 20/20
  OS -3.00 + 1.75 x 096 20/20

Add
  OD +1.75DS 20/20 J1+
  OS +1.75DS 20/20 J1+
Pete

- Ocular health
- 1+ meibomian gland dysfunction OU
- 2+ chemosis OU
- Normal intraocular pressures OU
- Normal posterior segment OU

Additional Questions and Responses for Pete

1. What do you currently use to read with your contact lenses?
   1. Nothing. It is difficult to read with contact lenses.

2. How often do you want to wear your contact lenses?
   1. All day, every day.

3. Do you want to sleep in contact lenses?
   1. No.

1. What are your hobbies?
   1. Reading, art and design.

2. Do you have glasses?
   1. Yes, five years old.

What do you recommend for Pete?

1. Multifocal contact lenses
   1. Soft multifocal
   2. Soft toric multifocal
   3. Gas permeable multifocal
   4. Hybrid multifocal

2. Monovision contact lenses
   1. Soft
   2. Soft toric
   3. Gas permeable
   4. Hybrid
What do you recommend for Pete?

3. New glasses
   1. Emphasize importance of a up to date pair of glasses.

4. Treat meibomian gland dysfunction
   1. Eyelid scrubs and warm compresses.
   2. Will improve contact lens comfort.

5. Treat allergic conjunctivitis
   1. Alcaftadine 0.25% one drop daily both eyes without contact lenses.
   2. Avoid eye rubbing.
   3. Refrigerated non-preserved artificial tears as needed.

Pete – Soft vs. Hard?

- Corneal toricity vs. manifest refraction in order to determine type of astigmatism correction.

<table>
<thead>
<tr>
<th>Keratometry</th>
<th>Manifest refraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD 42.50 / 44.75 @ 082</td>
<td>OD -2.75 + 1.75 x 079 add+1.75</td>
</tr>
<tr>
<td>OS 44.50 / 44.75 @ 090</td>
<td>OS -3.00 + 1.75 x 096 add+1.75</td>
</tr>
</tbody>
</table>

Pete – Soft vs Hard?

- Soft toric lenses are the winner to correct astigmatism
- Soft (non-toric), hybrid and gas permeable will not correct astigmatism of left eye
Pete Contact Lenses

• Astera Multifocal 8.6 / 14.5
  OD -1.25-1.75x170 profile 2
  OS -1.25-1.75x006 profile 2

VA
  OD 20/20-2 J1
  OS 20/25 J1

Binocular
  20/15-2 J1+

Pete Contact Lenses

Fit:
  OD well centered, good movement
  2 degrees temporal, stable with blink
  OS well centered, good movement
  2 degrees nasal, stable with blink

• Pete reports good distance, mid-range and close up vision with Astera Multifocal contact lenses.

ASTERA Multifocal Toric

• Presbyopia is one of the industry’s fastest growing segments
• 45% of presbyopes are astigmatic
• Astigmats are aging out of toric lenses have few SCL options
Multifocal Optics by Precilens

- Optics featured in the C2T multifocal toric
- Stabilized near & distance zone
- Large spherical zones to ensure minimal visual compromise
- Ability to adjust near and distance parameters independently
  - Profile 1 adds to ≤ +1.50D
  - Profile 2 adds +1.75 to +2.25D
  - Profile 3 adds ≥ +2.50D

Toric Design by Alden Optical

By using advanced CAD / CAM technology, Dual Elliptical Stabilization™ precisely adds mass at 3 & 9.
- Faster rotational alignment
- Improved orientation
- Excellent rotational stability
- Reduced lens thickness
- Unlimited base curve / diameter combinations for precise fitting

Astera Multifocal Fitting Pearls

- Always start with new refraction.
- Push plus in the distance.
- Always start with equal ADD profiles in both eyes.
- Allow lenses to settle for 10-15 minutes prior to evaluating vision.
- Dispense lenses and allow patient to adapt
- Correct low levels of astigmatism to provide best distance vision.
- When over-refracting, use hand held trial lenses.
  (Avoid phoropter or auto-refractor).
Pete Contact Lenses

“Unbelievable! I am able to see all distances clearly. Sometimes I forget that I am wearing contact lenses at all.”

Astigmatism in Soft Multifocal Contact Lenses

- Residual astigmatism more noticeable when in dominant eye
- 0.75D or more
- Distance spherical refractive error is low
- Patient is a “sharpener”
Angle Lambda and Multifocals

- Fovea is decentered temporal
- Visual axis passes through the lens 1 to 9 degrees nasal to center

Study – What is Normal?

- Subjects = 18
- Enrolled based on:
  - Central K 43.00 D
  - <1.00 D corneal toricity
  - Visible Iris Diameter 11.8mm +/- 0.2mm
- 5 Commercially available multifocals chosen
- Lenses allowed to settle centration verified
- Over topography performed
Corneal Mapping over Air Optix Aqua 8.6/14.2 -3.00 (High Add)

Corneal Mapping over Purevision MF 8.6/14.0 -3.00 (High Add)

Corneal Mapping over Acuvue Oasys MF 8.4/14.3 -3.00 (High Add)
Corneal Mapping over Biofinity MF 8.7/14.4 -3.00 (+2.50 Add) D

Corneal Mapping over Biofinity MF 8.7/14.4 -3.00 (+2.50 Add) N

Study

- Mismatch always temporal
- Mismatch range = 0 – 1.25mm
- Mismatch average = 0.50mm
Decenter the Optics
Decenter the Lens

Subject 1 OD – Standard MF
Multifocals

- Centration is critical (over line of sight)
- Alter base curve or diameter
- Consider other lens design
- Consider custom multifocal
- Consider monovision

Observation

Why do soft contact lenses frequently decenter temporally???

Observation

Scleral lenses frequently decenter temporally
Clinical Observations

“Vision is clear, but seems a bit off”

“My eyes feel strained with the lenses on”

“I can’t explain...something just doesn’t seem right”
Applications

• Scleral lenses
  – Ortho K
  – Multifocal

• Soft contact lenses
  – Multifocal
  – Toric
  – Specialty soft for irregular corneas
  – Higher order aberration correction
Anna

- 57 year old Hispanic female
- Presented for a contact lens examination
- Dry eyes with contact lenses.
- Wears reading glasses for near vision with contact lenses.
Anna

• Does not wear glasses for distance.
• Decrease in distance vision.
• Slight dryness when not wearing contact lenses.
• Dryness is much worse with contact lenses.
• No other complaints.

Anna

• Medical history
  • Allergic rhinitis
  • Symptomatic menopause
• Medications
  • Estradiol and progesterone
• Ocular history
  • Dry eyes
  • Uses bottled Refresh drops in the morning and as needed.

Anna

• Architect
• Computer and reading 10 hours / day
• Has worn contact lenses for 45 years
• Currently wearing soft contact lenses for distance occasionally
Anna

- Contact lens history
- Wears soft contact lenses – unsure of parameters
- Average wearing time – 4 hours / day
- Wearing time today – not wearing
- Solution – soft MPS
- Rub lenses – no
- Replacement frequency – unsure
- Age of current lens – unsure
- Extended wear – no

Anna

- Entering acuity without correction for distance
  OD 20/25+2  PH NI
  OS 20/20+2  PH NI
- Current glasses
  +1.75 OTC reading glasses for near
  OD J2
  OS J2
- Keratometry
  OD 44.00 / 44.25 @ 096
  OS 43.75 / 44.50 @ 072

Anna

- Manifest refraction
  OD +0.50 + 0.25 x 174  20/20-1
  OS +0.25 + 0.50 x 009  20/20-1
- Add
  OD +2.25DS  J1+
  OS +2.25DS  J1+
Anna

- Ocular health
- 1+ meibomian gland dysfuction OU
- 2+ conjunctival staining OU
- 2+ central and inferior PEK OU
- Faint tear meniscus OU
- TBTUT 3 seconds OU
- F
- TBTUT 3 seconds OU
- OD
- OS

Anna

- Normal intraocular pressures OU
  - OD 16, OS 15 mmHg @ 9:46am
- OD
- Lens - 1+ Nuclear sclerosis OU
- Optic nerves
- OD 0.65 / 0.60 PPA
- OS 0.65 / 0.60 PPA
- Healthy rim OU
- Normal peripheral retinal examination OU

Additional Questions and Responses for Anna

1. Do you have any problems reading with your contact lenses?
   1. No, need reading glasses.
2. How do your contact lenses feel?
   1. Dry.
3. How often do you wear your contact lenses?
   1. Four times a month.
   2. Only able to wear contact lenses for 5 hours due to dryness.
4. How often would you like to wear your contact lenses?
   1. All day, every day.
5. How many times a day do you use your eyedrops?
   1. Usually two times a day.
6. What are your hobbies?
   1. Biking.
7. Do you have glasses?
   1. Only reading glasses.
What do you recommend for Anna?

1. Soft multifocal contact lenses
   1. Good option to correct distance, intermediate and near.
   2. May mask 0.25D cyl OD and 0.50D cyl OS.

2. Soft monovision contact lenses
   1. Disadvantage is loss of intermediate vision.

3. Continue wearing contact lenses for distance and use reading glasses over contact lenses
   1. Difficult for intermediate.

4. Hybrid multifocal contact lenses
   1. Good option to correct distance, intermediate and near.
   2. Will correct astigmatism.

5. Scleral multifocal contact lenses
   1. Good option, may want to try soft multifocal and hybrid multifocal lenses first.

6. Glasses for distance and near
   1. Always important to have glasses.

7. Additional testing to rule out glaucoma
   1. Yes.

8. Treat ocular surface more aggressively
   1. Definitely. Will improve vision and comfort with contact lenses.

Plan for Anna

1. Treat ocular surface.
   1. Topical cyclosporine and low dose steroid for one month.
   2. Non-preserved artificial tears and lubricant ointment at night.
   3. Omega 3 fatty acids.
   4. Eyelid hygiene.

2. Baseline glaucoma testing.
   1. Include pachymetry, gonioscopy, visual field, optic nerve photographs and optic nerve OCT.

3. New spectacle prescription.
   1. First time progression lenses.
   2. Review adaptation.

4. Fit multifocal contact lenses in the future once ocular surface is improved.
Anna – Soft Multifocal Lenses

Air Optix MF / 8.6 / +0.75H OU
VA OD 20/20 JS+
SOR OD pl to +0.25
SOR OS +0.25
New lenses
Air Optix MF / 8.6 / +1.00H OU
VA OD 20/20 JS+
SOR OD pl
SOR OS pl

Vision? Distance and near OK but not clear enough.
Comfort? Good.
Fit OU: Good central fit, good peripheral fit
Well centered, good movement
Clean lenses

Air Optix MF
Initial Diagnostic Lens Selection

• Keep it simple
• Spherical equivalent and vertex
• The only adjustment is if you end up on the 0.120, ALWAYS err on the side of plus
  • Ex: +5.25 vertexes (@12mm) to +5.62: initial trial lens +5.75
• Choose the ADD based on the Fitting Guidelines recommendations
  – Keep them equal
  – Don’t cut the add in one or both eyes

Air Optix MF
Adaptive Minus Power Profile

Slide courtesy of Alcon
AIR OPTIX® AQUA MULTIFOCAL LENS PARAMETERS

Slide courtesy of Alcon

Anna – Hybrid Multifocal Lenses

OD Duette MF 7.50 / -0.50 / steep / SM
OS Duette MF 7.50 / +0.25 / steep / SM
OD: 20/20 J2 SOR +0.25 NI
OS: 20/25-1 J1+ SOR -0.25 20/20
Binc: 20/20 J1+

Vision?
Distance “fine”, 8/10. Near “Good”. Doesn’t have to wear reading glasses.

Comfort?
Not very comfortable. Can feel edges of lenses.

Fit OU: Good central fit; good peripheral fit
Well centered, good movement
Clean lenses

Duette Multifocal Design

• Built on the Duette platform
• Oxygen permeable materials
  – GP center: 130Dk
  – Soft Skirt: 84Dk
• Aspheric optics
Duette Multifocal Design

- Simultaneous Vision
- Center near
- Continuous change in power (Near to Distance)
- Aspheric (lineless)
- Two sizes: Small and large
- Same power in both zones
  - Small zone – power more concentrated
  - Large zone – power more dispersed
- No add power change each year.

Ideal Duette Multifocal Fit

Color inside ring slightly lighter green than the ring

Patient will be comfortable.
Movement similar to a soft lens.

Incorrect Skirt Curve

Skirt Curve Too Steep
Patient may feel discomfort or awareness under the lid right away.

Skirt Curve Too Flat
Patient may feel discomfort after some wearing time.
Anna – Scleral Multifocal Lenses

Maxim scleral lenses Boston XO2
OD 7.85 (43.00) / +1.50 / +2.25 / +2.50 / +2.75 Sag 4.65 2.5 add zone
OS 7.85 (43.00) / +1.50 / +2.25 / +2.50 / +2.75 Sag 4.75 2.0 add zone

Vision? Good. Able to see distance, computer and near.
Comfort? Very comfortable.

Average Wearing Time: 10 hours
Wearing Time Today: 4 hours
Solution? Clear Care & non-preserved 0.9% sodium chloride inhalation solution

Anna

• Entering VA with contact lenses
  OD DVA 20/20+1 NVA J3 SOR pl
  OS DVA 20/20+2 NVA J1 SOR pl

OD
  Good central apical clearance
  No blanching
  Clean surface

OS
  Good central apical clearance
  No blanching
  Clean surface

Anna – Scleral Multifocal Lenses

New right lens
Maxim scleral lenses Boston XO2
OD 7.85 (43.00) / +1.50 / +2.25 / +2.75 Sag 4.65 2.0 add zone

Entering VA with contact lenses
OD DVA 20/20+1 NVA J1 SOR pl
OS DVA 20/20+2 NVA J1+ SOR pl

Comfort? Still very comfortable.
The Tear Film Surface Quality (TFSQ) Index

Medmont Corneal Topographer

The topographer captures and analyzes a placido image every second for 30 seconds.

The height of the tear film is measured and recorded as the Tear Film Surface Quality (TFSQ).
Dry Eye Patient
0 Seconds
TFSQ Index 0.025

5 Seconds
Post Blink
TFSQ Index 0.103

On-Eye Material Surface Wetting Properties

Soft Contact Lens
Rigid Contact Lenses Materials
Three Different Brands -3.00 D. SCL’s
Same Patient, Same Eye

Thank You!

Please feel free to contact us with any questions
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