

# **MULTIFOCALS VS. MONOVISION: THE DILEMMA**

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## **INTRODUCTION (5 minutes)**

### **CRYSTALLINE LENS**

- Hardens with age
- Gradually loses elasticity
- Patient loses ability to accommodate

### **MOTIVATION FOR CLs IN THE PRESBYOPIC PATIENT**

- Disturbed by thought of wearing reading glasses or bifocals
- Difficulty adjusting to spectacle correction
- Strong desire to maintain appearance of health & fitness
- Recent change in marital status
- Desire to continue to see & be seen without glasses

### **GOOD MULTIFOCAL CANDIDATES**

- Distance Rx over 0.75 D
- Current CL wearer
- Dislikes glasses
- Needs vision at intermediate range
  - Computers
  - Music
- No dry eye problems
- Hyperopic or high myopic Rx

### **POOR PRESBYOPIC CANDIDATES**

- Dry Eyes, Poor Tear Film
- Minimal Distance Rx
- High Add Powers
- Poor Motivation
- High Astigmatism

## **LIMITATIONS OF CLs FOR THE PRESBYOPE**

- Design of lenses
- Unrealistic expectations
- Small pupil size
- Dry eyes
- Rx out of CL parameter range
- Health problems
- Occupational/recreational needs

## **LENS OPTIONS & PATIENT COMMUNICATION** **(18 minutes)**

### **CL OPTIONS FOR THE PRESBYOPE**

- Single vision for DV
  - Glasses for NV
- Single vision for NV
  - Glasses for DV
- Soft or GP bifocals/multifocals
- Monovision
- Modified monovision

### **COMMUNICATING WITH THE PATIENT**

- Explain presbyopia
  - Use poster or eye model
    - Crystalline lens
    - Ciliary muscle
    - Accommodation
- Explain limitations of lenses
  - Lens size
    - Compressing Rx from spectacle lens to lens smaller than a dime
  - Pupil size
  - Dry Eyes
- Need for “booster” glasses for
  - Tiny print
  - Prolonged reading
- Answer myopes’ complaints of better near vision without glasses

## **EXPLAIN ADVANTAGES OF LENSES**

- Multifocal vs. monovision
  - Binocularity
  - Range
  - Intermediate vision
- Cosmesis
  - Part-time or social wear vs. full-time wear

### **Simultaneous Vision**

- Light from all distances enters pupil at same time
- Brain chooses image it needs & filters out images from other distances
- Concentric
- Distance in center
  - Near in center
  - Single ADD
  - Progressive ADD

## **CHECKING VISUAL ACUITY**

- Check near & distance VA binocularly
- Then check each eye separately
- Consider unequal eyes to maximize DV & NV
- Send patient outside to evaluate DV
- Use magazines, newspapers, music, maps to evaluate NV

## **CENTER NEAR vs. CENTER DISTANCE**

### **Center Distance**

- Good for athletes, police
- Flare & ghosting around lights at night
  - Pupillary dilation in dim light
- May not reach maximum add zone
  - Pupil too small

## **CENTER NEAR PROGRESSIVE MULTIFOCALS**

- Less flare & ghosting
- Pupil dilates out into distance zone at night
- Need sunglasses in bright light to see at distance

- Poor NV in dim light
- 3-D Effect at near (adaptive symptom)

### **LIMITATIONS OF SIMULTANEOUS VISION**

- Small presbyopic pupil
- Changing lighting conditions
- Flare & ghosting
- Centration problems
- Slow response of brain in choosing correct image
- “3-D” effect of center near lenses
- Compromise in near, distance, or a little of each

### **ALTERNATING VISION (Translating Bifocals)**

- Good distance & near
- No intermediate
- Must translate
  - Patient looks down
  - Lid pushes lens up
- Prism Ballast
- Truncation
- May not be comfortable
- Thick edge may cause scleral indentation in SL wearers

### **LIMITATIONS OF TRANSLATING LENSES**

- Position of patient’s lower lid
- Failure to translate properly
- Failure to translate simultaneously
- Near vision only in downgaze

### **GELFLEX TRITON**

- Only soft translating bifocal
- Prism Ballast
- Truncation
- May not be comfortable
- No intermediate
- Thick edge may cause scleral indentation

## **RIGID BIFOCALS**

- Must translate equally & simultaneously
- Can read only in downgaze; can't read in upgaze
- No intermediate vision in most
- Require prism ballast & truncation
- Less comfort than aspheric multifocals

## **ASPHERIC MULTIFOCALS (18 minutes)**

### **GOOD ASPHERIC MULTIFOCAL CANDIDATES**

- Early to moderate presbyopes
- Intermediate vision requirements
- Successful GP wearers
- Myopes -5.00 or less
- Hyperopes +.50 or more
- Up to 3.0D corneal cylinder

### **POOR ASPHERIC MULTIFOCAL CANDIDATES**

- Add requirements of over +2.25
- High myopes
- Small pupils
- Minimal distance requirements
- Residual astigmatism
- Centration problems with GP's

### **POSTERIOR SURFACE RIGID ASPHERIC MULTIFOCALS**

- Fit conventionally or steep
- Steep-fitting designs may cause spectacle blur
  - Mechanical molding
- Combine simultaneous vision & translation
- Can place more add power on front surface
- Good for computer users
- Must center almost perfectly

### **ASPHERIC MULTIFOCAL ADVANTAGES**

- Easy to fit
- Comfortable design
- Wide range of vision
- Gaze independent

### **ASPHERIC MULTIFOCAL DISADVANTAGES**

- ? ability to resolve simultaneous images
- Corneal changes
- Centration dependent

### **PROGRESSIVE MULTIFOCAL CANDIDATES**

- Current SV GP patients who now require an add power of up to +2.25D
- Monovision patients desiring natural intermediate vision such as computer operators and musicians

### **TRIAL FITTING**

- Determine best distance refraction and near add
- Select trial lens
- Allow 30 minutes to equilibrate
- Evaluate fit
- Overrefract using hand-held trial lenses and trial frame
- Ensure centration
- Maximize plus at distance
- Use hand-held trial lenses to over- refract
- Over-refract in normal room light

### **FIT EVALUATION**

- Central positioning and apical clearance are essential to realize the maximum add power
- If the lens is decentered the visual axis will bisect an area of the lens with increasing add power, decreasing distance acuity

## **FRONT SURFACE RIGID MULTIFOCALS**

- Fit conventionally
- Minimize spectacle blur
- Combine simultaneous vision & translation

## **POSTERIOR SURFACE RIGID ASPHERIC MULTIFOCALS**

- Fit conventionally or steep
- May have spectacle blur in steep designs
  - Mechanical molding
- Combine simultaneous vision & translation
- Can place more add power on front surface

## **WHAT ABOUT MONOVISION? (10 minutes)**

### **MONOVISION**

- One eye, usually the dominant eye, is corrected for distance, the other for near
  - One eye sees *only* near; the other *only* distance
  - Loss of stereopsis

### **GOOD MONOVISION CANDIDATES**

- Teachers
- Public speakers
- Politicians
- Performers
- Astigmats
- Emmetropes
  - Multifocal for mature Presbyopes

### **POOR MONOVISION CANDIDATES**

- Prolonged close work
- Long distance & night driving
- Patients with amblyopia
- Patients who need good binocularity
  - Dentists
  - Surgeons
  - Jewelers

## **SELECTING THE DISTANCE EYE**

- Which hand is dominant?
- Which eye do you use with camera?
- Which is less myopic eye?
- Where is data entry copy kept?

## **UNILATERAL CL WEARERS**

- Emmetropes need only near lens
  - Remove for long-distance or night driving
- Low myopes need only distance lens
  - Give CL for other eye for long-distance or night driving

## **MONOVISION PROBLEMS**

- Loss of stereopsis
- Flare & halos in near eye at night
- Side-view mirror blurry if near eye is OS
- Legal issue in case of accident
- Failure to adapt
  - Interference between near & distance images
  - Time needed to “train” brain

## **MODIFIED MONOVISION**

- Multifocals with unequal adds
  - Allow all-range vision, better stereopsis in patients with higher add requirements

## **RESERVATIONS OF FITTERS**

### **Conflicting Goals**

- Good binocularity & stereopsis vs. patient demand for near vision without any optical aid

## **FOR MAXIMUM SUCCESS**

- Screen patients carefully
- Understand presbyope’s needs & expectations
- Understand limits of each modality
- Discuss all options honestly with patients