


On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.



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WHEN YOUR PRESBYOPE ONLY WANTS SURGERY

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DISCLOSURES:

- Allergan/Abbvie
- Viartis

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GOALS OF TODAY'S LECTURE

1. What is the current state of presbyopia and presbyopia treatments?
2. How to determine if surgery is a good option for your patient
3. Pro and cons of presbyopia surgeries?
4. Considerations for each type of surgery
5. How to manage/comanage surgical interventions for presbyopic patients

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PRESBYOPIA STATISTICS

- Greater than 1.8 billion presbyopes in the world¹
 - Expected to rise to 2.1 billion by 2030¹
- Onset of age is approximately 40
 - Younger in areas with closer proximity to the equator²
- Presbyopia has a suspected earlier onset due to the pandemic³
- Estimated \$11 billion global productivity losses due to presbyopia⁴
- Every year approximately 1.4M new presbyopes⁵

1. Katz et al. "Presbyopia: A Review of Current Treatment Options and Emerging Therapies." Clinical Ophthalmology. 2021; 15: 2167-2176.
2. Lohr, Tina. "Presbyopia and Eye Treatment." <https://www.verywellhealth.com/presbyopia-2786686>. October 2018.
3. ResearchGate. "Presbyopia: A Review of Current Treatment Options and Emerging Therapies." https://www.researchgate.net/publication/354844440_Presbyopia_A_Review_of_Current_Treatment_Options_and_Emerging_Therapies.
4. Berrall, Alan S. "Onset of Presbyopia: Chapter 10, Vision 5, Prevalence and Economic Burden of Presbyopia in a Systematic Review." <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6221114/>.
5. Statista. "The Global Number of Presbyopia Treatment Options." Modern Ophthalmology. Sept. 2021. 68-69.

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How many times today have you looked at your phone?



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SETTING THE SCENE

- Existing patient comes into your office for an annual exam
 - Chief Complaint: Patient is noticing more difficulty seeing up close
 - Dx: Presbyopia
 - "Doctor- What are my options?"

What opportunities exist and what do we consider for our patients?

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PRESBYOPIA TREATMENT COMES WITH INHERENT CHALLENGES

1. What are they?
2. How do we, as physicians, minimize these challenges?
3. How do we prepare/set patient expectations?

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PATIENT CONSIDERATIONS FOR PRESBYOPIA TREATMENT- THE FIRST STEP

- Patient demographics
 - Age, occupation, hobbies
- Surgical history
- Ocular health
 - Level of presbyopia
 - Previous ocular surgical history
 - Anterior and posterior segment health
- Who does the procedure? Is there someone in your area?
- What presbyopia treatments has the patient previously tried?
 - Success vs failure
- Patient expectations
- Healing time

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EVALUATING FOR PRESBYOPIA TREATMENT

- What are the presbyopes everyday needs?
 - Intermediate vs near vs both
 - What options will best hit those targets?
- Where is their vision lacking? Where is their vision doing well?
- What is current level of presbyopia?
 - Mild= +1.25 or less
 - Moderate= +1.5— +2.00
 - Advanced= +2.25+
- What preoperative testing do I need?
 - OCTs, pachs, dilated fundus exam, endothelial count, IOL master, A-scan, topography

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THERAPEUTIC CONSIDERATIONS FOR PRESBYOPIA TREATMENT

- What options do we have to offer?



- "But I don't want to wear glasses or contacts anymore"
 - What surgical options do we have available?

*Not FDA approved or available in the US at this time

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REFRACTIVE LENSECTOMY/CATARACT SURGERY FOR PRESBYOPIA MANAGEMENT

- Surgical options:
 - Monofocal
 - Allows for one distance optically
 - Accommodative
 - Haptics allow for lens to change positioning/ placement within capsule
 - Multifocal
 - Offers multiple focal points typically with designated "rings" in lens design
 - Extended depth of focus (EDOF)
 - Creates a single extended focal point to enhance depth of focus
 - Small aperture
 - Type of EDOF
 - Light adjustable
 - Adjusted through a series of UV light treatments postoperatively giving an EDOF/monofocal outcome

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MONOFOCAL IOL WITH MONOVISION

- **Pros:**
 - Quality of vision at near and far with monofocal optics
 - Cost
 - Chair time post-operatively
- **Cons:**
 - Monovision trial necessary
 - Loss of depth perception
 - Choice between 2 of 3 distances
- **Patient considerations:**
 - Has the patient tried/failed with monovision?
 - Job/hobbies with lack of depth perception
 - What is target for non-dominant eye?

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ACCOMMODATIVE IOL

- **Pros:**
 - Monofocal optics
 - No need for trials
- **Cons:**
 - Amplitude of accommodation/healing variability
 - Axial length
 - Did the lens heal more forward or backwards than expected?
 - Cost to patient
 - Adaptation period
 - Chair time post-operatively
 - Potential need for LASIK/PRK adjustment
 - Corneal measurements prior to lensectomy
- **Patient considerations:**
 - Conversation with patient about need for glasses
 - Non-dominant eye target
 - -0.25 to -0.50sph
 - Exercises post-operatively
- **Types of accommodative IOLs:**
 - Crystallens/Trulign
 - Lumina*
 - Juvene*
 - Jellisee*

*Not FDA approved at this time

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MULTIFOCAL IOL

- **Pros:**
 - Vision at all distances- Distance, intermediate, near
 - Improving technology
- **Cons:**
 - Glare/halos
 - Generation of focused makes a difference
 - Decreased contrast sensitivity*
 - Increased HOAs
 - Cost
 - Adaptation period
 - Potential need for LASIK/PRK adjustment
 - Corneal measurements prior to lensectomy
- **Patient considerations:**
 - Higher order aberrations
 - Retinal/macular health
 - Previous corneal procedures?
 - Dry eye?
 - Pupil size
 - Lens centration
- **Types of multifocal IOLs**
 - PanOptix
 - ReStor
 - Technis
 - RayOne Trifocal*

*Not FDA approved at this time

6. Wang YJ, Dean ML, Ding G, Steinhilber R, Lichten PR. Patient-centered and visual quality outcomes of premium cataract surgery: a systematic review. *Jour J Ophthalmol*. 2017;27(10):1847-60.

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EXTENDED DEPTH OF FOCUS

- **Pros**
 - Reduced glare/halos compared to MF IOLs
 - Good distance and intermediate vision
 - Better option for higher order aberration patients
- **Cons**
 - Reduced near VA compared to other lens options
 - Cost
 - Potential need for LASIK/PRK adjustment
 - Corneal measurements prior to lensectomy?
- **Patient considerations:**
 - Has the patient had previous corneal procedures?
 - RK, LASIK, PRK
 - High amount of HOAs?
 - Retinal health?
 - Possibly a better choice for patients with macular/retinal health concerns due to lack of decrease in contrast sensitivity
- **Types of EDOF IOLs:**
 - Symfony
 - Vivity
 - FineVision Triumf*

*Not FDA approved at this time

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SMALL APERTURE IOL (EDOF)



- **Pros:**
 - Reduced glare and halo
 - Better option for patients with surface irregularities
- **Cons:**
 - Contraindicated in patients with macular/retinal disease
 - Monocular use
 - Monofocal used in dominant eye
- **Considerations:**
 - Amount of cylinder
 - Has been effective up to 1.50D
- **Types of Small Aperture IOLs**
 - IC-8 Aphera IOL

7. Acuflex. "IC-8 Aphera IOL Features." acuflex.com.

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LIGHT ADJUSTABLE IOL WITH LIGHT DELIVERY SYSTEM

- **Pros:**
 - Can manipulate power based on patient healing
 - No need for LASIK/PRK adjustment
- **Cons:**
 - UV blocking glasses postoperatively
 - Chair time postoperatively
 - Cost
 - Depth of focus- patients may still need glasses
- **Patient considerations:**
 - Pupil size for light adjustment
 - Needs to be 6mm
 - Patient compliance with UV glasses
 - Medications
 - History of herpetic infection
 - Nystagmus/uncontrolled eye movements
- **Types of Light Adjustable Lenses**
 - RxSight LAL



8. RxSight. "Customizing your vision." <https://www.rxsight.com/us/customizing-your-vision/>

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LASIK/PRK

- Pros:
 - Healing time
 - Difference between LASIK vs PRK
 - Surface procedure
- Cons:
 - Lack of depth perception
 - Choice between 2 of 3 distances
- Patient considerations:
 - Age and lens status
 - Monovision trial
 - Absolute vs relative contraindications:
 - Systemic health
 - Autoimmune/collagen vascular diseases
 - Ocular health
 - Dry eye, HSK, keratoconus, corneal thickness
 - Medications?
 - Isotretinoin?
 - Non-dominant eye target?
 - Continuously changing need as presbyopia continues to develop

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CORNEAL INLAYS*

*Not FDA approved or available at this time

- Pros:
 - No tissue removed from eye with implantation
 - Removable
- Cons:
 - No availability in the US with FDA approval at this time
 - KAMRA Inlay discontinued in 2022⁹
 - Reindrop- FDA class 1 recall
 - Mild to moderate presbyopes
 - Corneal haze
 - Compromised distance/night vision
- Considerations:
 - Types: Refractive, corneal shaping, small aperture
 - Allotex allogenic corneal inlay¹⁰
 - Trials are underway at centers in Europe
 - Presbyla Flexivue Microlens¹¹
 - Hydrogel implant
 - Approved in Europe
 - Not FDA approved at this time
 - CorVision¹²
 - Collagen implant
 - Emmetropic status
 - Allotex currently being studied at -0.75 to +1.00 with 0.75D of cyl or less

9. Insight eye clinic. "Kamra Inlays for Presbyopia." <https://www.insighteye.com/eye-care/eye-surgery/corneal-inlays/>
10. Allotex. "Allotex." <https://www.allotex.com/>
11. Allotex. "Flexivue." <https://www.allotex.com/flexivue/>
12. Allotex. "CorVision." <https://www.allotex.com/corvision/>

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CORNEAL INLAYS

- Kamra inlay⁹
- Presbyla Flexivue inlay¹¹
- Raindrop inlay¹³

13. Boston Optix. "Raindrop near vision inlay." <https://www.bostonoptix.com/raindrop/>

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SCLERAL IMPLANT/EXCISION*

*Not FDA approved or available at this time

- Pros:
 - No changes to any structures in the visual axis
 - Extended depth of focus- "pseudocommodation"
- Cons:
 - Not FDA approved in the US at this time
 - Controversial
- Considerations:
 - Implant vs excision

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CONDUCTIVE KERATOPLASTY (CK)

- Pros:
 - No scalpel or laser necessary
 - Lower cost option
- Cons:
 - Mild monovision
 - Over-correction vs under-correction
 - High rate of regression
- Considerations:
 - Refractive status of dominant eye
 - Not as readily available

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14. Hertz, PR. "Optics of conductive keratoplasty: implications for presbyopia management." *Transactions of the American Ophthalmological Society*. Dec 2005; 103: 412-456.

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HYPOTHETICAL CASE #1

- A 46YOF patient comes into the office with near visual concerns.
 - UCNVA 20/40
 - Needs hyperopic correction to achieve 20/20 distance
 - Measured add power of +1.25 gets her to 20/20 NVA
 - Anterior and posterior seg findings WNL OU
 - Has tried monovision and multifocal contacts with little success
 - Reports inability to wear glasses due to hobbies
 - Low amount of HOA
- What options are most appropriate for this patient?

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HYPOTHETICAL CASE #1

- Best surgical options:
 - **Refractive lensectomy**
 - Discussion would include conversation about still having some accommodative ability and how that will possibly change
 - Was not successful in monovision contacts = NOT a candidate for monovision refractive lensectomy
 - Possibly accommodative, EDOF, or multifocal IOL
 - **LASIK/PRK**
 - Discussion would include conversation that near add power will continue to change and need for enhancement or other surgical intervention may be necessary in the future
 - Unsuccessful in monovision CTLs

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HYPOTHETICAL CASE #2

- 67YOM patient with moderate cataracts presents for a cataract evaluation and is interested in regaining his near visual acuity as well as preserving distance visual acuity
 - UNVA 20/100
 - Measured add power of +2.50
 - Anterior seg findings WNL
 - Posterior seg findings show mild pigment mottling in maculas OU
- What options are most appropriate for this patient?

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HYPOTHETICAL CASE #2

- Cataract surgery with lens exchange
 - Which lens type?
 - Multifocal IOL
 - Decrease contrast sensitivity and increase in higher order aberrations in someone already showing macular changes
 - EDOF
 - Possible
 - Consider age of patient, severity of macular changes
 - Monovision with monofocal IOL
 - Possible
 - Consider macular changes- is one eye more advanced than the other?
 - Light adjustable lens
 - Dependent on severity of macular changes

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HYPOTHETICAL CASE #3

- 56YOF patient presents to the office with near visual concerns and mild lens changes
 - UNVA 20/60
 - Measured add power of +1.75
 - Anterior seg findings show 8 RK incisions OU
 - Posterior seg findings WNL
 - Has worn monovision contact lenses in the past with success
- What options are most appropriate for this patient?

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HYPOTHETICAL CASE #3

- 1. Refractive lensectomy
 - Discussion would include conversation about still having some accommodative ability and how that will possibly change
 - Possibly accommodative, EDOF, monofocal with monovision, Light adjustable, small aperture
 - Would not recommend multifocal lens at this time
- 2. PRK
 - Discussion would include conversation that near add power will continue to change and need for enhancement or other surgical intervention may be necessary in the future- possible cataract surgery at that time?
 - What do K's look like? How flat is cornea from the RK incisions?

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MANAGING PRESBYOPIC SURGERY PATIENTS

- Clear discussion over what outcome each surgery can provide
 - Paperwork sent to patient prior to surgical evaluation with explanation of options
 - Simulation devices
 - Time to decide
- Setting expectations after decision has been made
- Depending on procedure, may be a multi-step process- Pre AND post operatively
 - Ocular health is WNL
 - Need for adjustments post operatively
 - YAG, LASIK/PRK, UV light treatments
 - Patience is key!
- Consent forms
 - "I have chosen _____ option for surgery and I understand the need for glasses for certain tasks may be necessary"
- Under promise and over deliver

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WHEN SURGERY IS NOT THE RIGHT OPTION

Drops

- Vuity- Allergan/Abbvie¹³
 - FDA approved October 2021
 - 1.25% pilocarpine
- Qloxi- Orasis¹⁴
 - FDA approved October 2023
 - 0.4% pilocarpine
 - Preservative free
- LN2100 and LN2101- Lenz Therapeutics¹⁵
 - Aceclidine-based eye drop
 - In trials
- Brimochol- Visus¹⁶
 - Carbachol and brimonidine
 - In trials
- Microline- Eyenvia¹⁷
 - 2% pilocarpine microdose array print formulation
 - In trials

13 Vuity: www.vuity.com
 14 Qloxi: www.qloxi.com
 15 Lenz Therapeutics: www.lenz-tx.com
 16 "Microline Eyenvia: www.eyenvia.com/brimochol"
 17 "Eyenvia announces positive results from VISOR 2 Phase 3 study of Microline as a potential on-demand treatment for presbyopia." Globe Newswire. 06/11/2023

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OVERVIEW

- One surgical procedure does not fit all
- One choice may not correct patients vision at all distances at all times
- Multiple procedures may be necessary to achieve desired outcome
- Setting expectations is key
- Optimizing ocular surface health prior to surgical intervention yields best outcomes
- Evaluation of entire eye is absolutely necessary

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THANK YOU!

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