WHEN YOUR PRESBYOPE ONLY WANTS SURGERY

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DISCLOSURES:

- Allergan/Abbvie

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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 world[1]
  - Expected to rise to 2.1 billion by 2030[1]
- Onset of age is approximately 40
  - Younger in areas with closer proximity to the equator[2]
- Presbyopia has a suspected earlier onset due to the pandemic[3]
- Estimated $11 billion global productivity losses due to presbyopia[4]

1. Katz et al. "Presbyopia- A Review of Current Treatment Options and Emerging Therapies." Clinical Ophthalmology. 2021: 15, 2167-2178.
2. Lahti, Tina. "Presbyopia and Sun Exposure." https://www.2020mag.com/. October 2018. https://www.2020mag.com/article/presbyopia-and-sun-exposure#:~:text=The%20onset%20of%20presbyopia%20tends,degrees)%2C%20it%20is%2043.
3. Negishi, Kazuno, Ayaki, Masahiko. "Presbyopia developed earlier during the COVID-19 pandemic." PLoS One. November 2021. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0259142
4. Berdahl J, Bala C, Dhariwal M, Lemp-Hull J, Thakker D, Jawla S. Patient and economic burden of presbyopia: a systematic literature review. Clin Ophthalmol. 2020;14:3439-3450.

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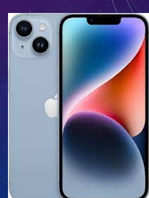
How many times today have you looked at your phone?



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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?

Glasses	Contacts	Refractive lensectomy	Inlays	Corneal inlays*	LASIK/PRK	Scleral implant/ excision*	Conductive Keratoplasty

- "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 aperature
    - 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

*Not FDA approved at this time

- 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:
  - Crystalens/Trulign
  - Lumina*
  - Juvene*
  - Jellisee*

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MULTIFOCAL IOL

- Pros:
  - Vision at all distances- Distance, intermediate, near
  - Improving technology
- Cons:
  - Glare/halos
    - Generation of lens used makes a difference!
  - Decreased contrast sensitivity[1]
    - Increased HOAs
  - Cost
  - Adaptation period
  - Potential need for LASIK/PRK adjustment
    - Corneal measurements prior to lensectomy

*Not FDA approved at this time

- 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*

1. Woo LY, Stem MS, Oren G, Shtein R, Lichter PR. Patient-centered and visual quality outcomes of premium cataract surgery: a systematic review. Eur J Ophthalmol. 2017;27(4):387-401

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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?

*Not FDA approved at this time

- 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*

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SMALL APERTURE IOL (EDOF)

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- 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 Apthera IOL

6. AcuFocus. "IC-8 Apthera IOL Features." Acufocus.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

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- 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

7. 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*

- 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 2022
    - Raindrop- FDA class 1 recall
  - Mild to moderate presbyopes
  - Corneal haze
  - Compromised distance/night vision
- Considerations:
  - Types: Refractive, corneal shaping, small aperture
  - Allotex allogenic corneal inlay
    - FDA trials to start in 2024
  - Emmetropic status

*Not FDA approved or available at this time

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SCLERAL IMPLANT/EXCISION*

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

*Not FDA approved or available at this time

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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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8. Hersh, PS. "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
  - UCNVA 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 monovison, 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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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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