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Increasing Your Happy Presbyopia Patients With the Latest Pharmaceutical and Surgical Options

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Increasing Your Happy Presbyopia Patients With the Latest Pharmaceutical and Surgical Options

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Content Source

This continuing medical education (CME) activity captures content from a live in-person symposium.

Activity Description

This supplement summarizes interactive case discussions by an expert panel on managing presbyopia with the latest surgical and pharmaceutical technologies.

Target Audience

This certified CME activity is designed for ophthalmologists.

Learning Objectives

Upon completion of this activity, the participant should be able to:

- **Define** the prevalence, etiology, and key characteristics of progression of presbyopia from early to late-stage patients
- **Outline** strategies for finding, communicating with, and educating patients about presbyopia-correction clinical outcomes, costs, risks, and benefits, including quality-of-life and quality-of-vision considerations
- **Describe** how the latest presbyopia-correcting IOL technologies and pharmaceutical presbyopia treatments can address outcomes in a new group of presbyopia patients, including those with comorbid conditions

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PRETEST QUESTIONS

Please complete prior to accessing the material and submit with Posttest/Activity Evaluation/Satisfaction Measures for credit.

1. Please rate your confidence in your ability to educate patients with presbyopia on the latest IOLs and pharmaceutical options (based on a scale of 1 to 5, with 1 being not at all confident and 5 being extremely confident).

a. 1
b. 2
c. 3
d. 4
e. 5

2. A 45-year-old woman has begun to feel the effects of presbyopia. She has a history of prior LASIK surgery and is not ready for a refractive lens exchange. What is a good treatment option that will preserve both her near and distance vision and work with her active lifestyle?

a. Presbyopia drops
b. Monovision contact lenses
c. Multifocal contact lenses
d. Reading glasses

3. The VIVID study uses a combination of carbachol and brimonidine to treat presbyopia. What is the role of carbachol in this combination?

a. Increases bioavailbility of brimonidine
b. Acts as a miotic
c. Prevents onset of hyperemia
d. Acts as a dilator

4. What is a key consideration for presbyopia-correcting drops?

a. Minimize adverse effects
b. Maximize onset time
c. Minimize duration of effect
d. Maximize impact on ocular surface health

5. A 50-year-old patient with high myopia is interested in a presbyopia pharmaceutical treatment. You opt to do a full workup before prescribing the drops. You decide to do an OCT. What are you looking for?

a. Age-related macular degeneration
b. Vitreomacular traction
c. Glaucoma
d. Dry eye

6. A 60-year-old man who is a successful monovision contact lens wearer is having difficulty with glare and his cataracts are NSC +2 and CC +2. His ocular surface is healthy, but he has moderate macular degeneration in the right eye. He is worried about cost but still wants good vision at all three distances. What IOL would you recommend?

a. Monofocal IOL
b. Multifocal IOL
c. Extended-depth-of-focus (EDOF) IOL
d. Hybrid multifocal/EDOF IOL

7. What IOL is best at correcting up to 1.50 D of residual astigmatism?

a. Hybrid multifocal/EDOF IOL
b. Small aperture IOL
c. Light adjustable IOL
d. EDOF IOL

8. What IOL can be adjusted postoperatively?

a. Hybrid multifocal/EDOF IOL
b. Small aperture IOL
c. Light adjustable IOL
d. Enhanced monofocal IOL

9. What amount of anisometropia is acceptable in mini monovision?

a. 0.50-0.75 D
b. 1.00-1.50 D
c. 2.00-2.50 D
d. >3.00 D

10. What IOL would you recommend for a risk-averse patient who wants good intermediate distance correction?

a. Hybrid multifocal/EDOF IOL
b. Small aperture IOL
c. Wavefront-shaping EDOF IOL
d. Enhanced monofocal IOL

11. What is a drawback of multifocal IOLS?

a. Fogging
b. Dry eye
c. Glare and halos
d. Reduced distance vision

Addressing the Early Presbyope With Pharmaceutical Presbyopia Treatments

Overview of the current pharmaceutical presbyopia treatments

BY ELIZABETH YEU, MD

The presbyopia population has grown over the last few decades, with 120 million US residents and 1.8 billion people globally with presbyopia.[1] The age of onset for presbyopia is between 40 and 45 years old. The presbyopia patient population has higher incomes and has received a higher level of education compared to prepresbyopic population, which means they work and live longer.

Compared to many other ailments, presbyopia significantly impacts quality of life, including functionality, aesthetics, increased risk of falls and hip fractures with bifocal spectacle wear, increased head injuries, psychological and mental health, and productivity.[2,3]

> *"Selecting the best candidate for pharmaceutical presbyopia treatment involves considering the age range and baseline refraction.[4]"*

There are many ways to correct presbyopia, including spectacles and surgery, but it is time to consider pharmaceutical options. Selecting the best candidate for pharmaceutical presbyopia treatment involves considering the age range and baseline refraction.[4] A patient with high myopia will need a different treatment plan than an emmetrope as miotics can increase the risk of detachment.[5] It is essential to understand patient's needs and characteristics such as profession, recreational activities, previous eye surgery, contact lens wear, and monovision.[6] Counseling patients on side effects is also crucial. There are key considerations for pharmaceutical presbyopia treatments (Figure).

Pharmaceutical presbyopia treatment approaches vary. Some treatments use pupil modulation, some use a combination of pupil modulation and ciliary body contraction, and others focus on lens softening.[4]

PUPIL MODULATION

Pilocarpine hydrochloride ophthalmic solution 1.25% (Vuity, Allergan, an Abbvie company) is the first pharmaceutical approved by the FDA to treat presbyopia. Pilocarpine induces miosis and ciliary body contraction. According to the GEMINI-1 and GEMINI-2 phase 3 clinical studies, pilocarpine 1.25% has a rapid onset time of about 15 minutes and duration of 5 hours without any impact on distance vision. Phase 3 results show a gain of at least 3 lines when administered bilaterally, once a day for 30 days. It limits night vision reduction as 75% of participants still had at least 2 lines distance corrected near visual acuity (DCNVA) improvement in mesopic conditions. In photopic conditions, 93% of participants achieved greater than 20/40 vision in photopic DCNVA. A side effect of pilocarpine is headaches, and patient education is essential as these headaches will improve over time.[4,7-9]

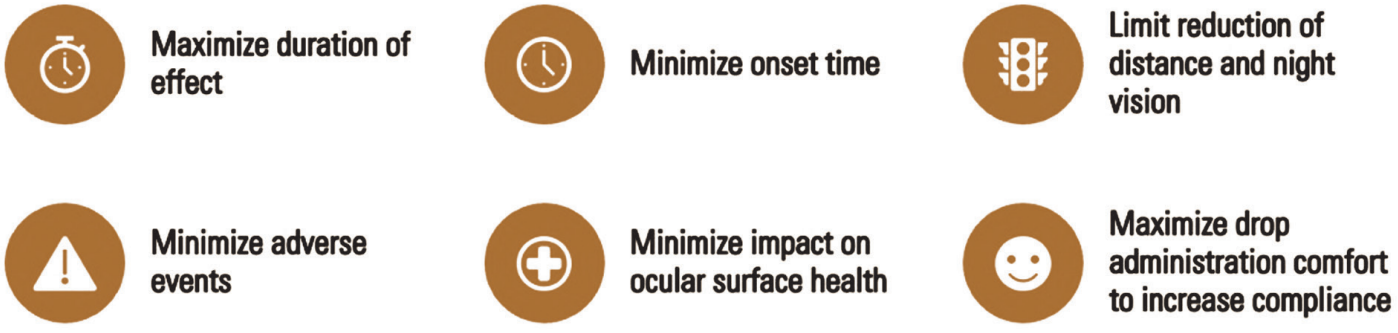

Figure. Key considerations for pharmaceutical presbyopia treatments.

CSF-1 (Orasis Pharmaceuticals) is a preservative-free, low-dose pilocarpine 0.4% drop that recently published top-line phase 3 data. The drop uses a proprietary vehicle that is ocular-surface friendly. In NEAR-1 and NEAR-2 clinical studies, there was at least a 3-line gain in near visual acuity when administered twice a day bilaterally. Participants did not report distance vision loss, and 50% of participants had an onset time of 1 hour after dose one and two. After 15 days, onset time was as early as 20 minutes, and duration was 8 hours. There were some temporary mild adverse effects, and participants reported high comfort levels.[10]

Aceclidine 1.75% (Lenz Therapeutics) is a pupil modulator that targets the iris sphincter. In phase 2B clinical trials, aceclidine 1.75% resulted in 81% of participants gaining at least 2 lines in 30 minutes, and 50% maintained this improvement for 7 hours. Phase 3 studies, LNZ100 and LNZ101, are underway to evaluate the efficacy of aceclidine and a combination of aceclidine and brimonidine. Brimonidine prevents pupil dilation and is discussed in more detail below.[11]

The Microline (Eyenovia) system uses a proprietary dispenser (Optejet) to instill 8 µL pilocarpine 1% or 2% to eliminate excessive overdosing, reducing systemic exposure.[12] Preservative-free 0.75% phentolamine and low-dose pilocarpine 0.4% (Ocuphire Pharma) restrict pupil size by inhibiting the iris dilator and constricting the iris sphincter.[4,13]

PUPIL MODULATION AND CILIARY BODY CONTRACTION COMBINATION

Brimochol (Visus Therapeutics) is a combination drop of brimonidine titrate 0.2% and carbachol 3%. Carbachol is a cholinergic agent that acts as a miotic. Brimonidine is an alpha 2-agonist that prevents pupil dilation, inhibits ciliary body contraction, and increases the bioavailability of carbachol while preventing the onset of hyperemia. The phase 2 VIVID study results included a 3-line improvement in uncorrected near visual acuity (UCNVA) after 1 hour without losing distance vision. It was well tolerated and had a favorable safety profile. Preservative-free brimochol and brimochol with BAK also demonstrated clinically significant efficacy and a 9-hour duration. Phase 3 BRIO studies are currently underway.[4,14]

LENS SOFTENING

UNR844 (Novartis) is a topical lipoic acid choline ester 1.5% in the recruiting stage of clinical trials. It softens the lens by breaking down its disulfide bonds, thereby increasing lens fluidics.[4,15]

PUPIL/APERTURE SIZE

Pupil/aperture size is critical for success with presbyopia patients, especially with pharmaceutical and small aperture IOL treatments. It is essential to understand the adequate aperture size achieved with different treatments and how that impacts the patient's visual quality and reading vision outcomes. There are varying numbers for the optimal pupil size. Xu et al report that the optimal pupil size without sacrificing distance and near visual acuity is between 2 to 3 mm.[16] As more data on presbyopia pharmaceutical drops is released, researchers will be able to determine the optimal pupil size. Other considerations are refractive error and the amount of residual accommodation.[7]

> *"The true goal of presbyopia correction is to mimic the human eye's natural ability to accommodate and focus on things up close."*

CONCLUSION

Presbyopia is a condition that negatively impacts quality of life for many. Refractive correction using spectacles, contact lenses, and surgery are not always viable options. The true goal of presbyopia correction is to mimic the human eye's natural ability to accommodate and focus on objects up close. With pharmaceutical presbyopia treatments, we are one step closer to achieving this goal.[17]

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Addressing Cataract Patient Needs With Next-Generation Presbyopia-Correcting IOLs


Review of optical designs and indications for presbyopia-correcting IOLs

BY KAROLINNE M. ROCHA, MD, PHD, AND VANCE THOMPSON, MD

Each patient you evaluate for cataract surgery will be different. It is crucial to choose the correct IOL, and this includes considering the patient's visual needs, lifestyle, daily activities, concerns about dysphotopsia, and comorbidities.[1] This article will discuss the different presbyopia-correcting IOL options available.

"It is crucial to choose the correct IOL, and this includes considering the patient's visual needs, lifestyle, daily activities, concerns about dysphotopsia, and comorbidities."

—Karolinne M. Rocha, MD, PhD

ENHANCED MONOFOCAL

The Tecnis Eyhance (Johnson & Johnson Vision) is a monofocal IOL that is progressive in power—the power changes continuously from the center to the periphery of the lens. The lens' aspheric design allows for pupil independence. This design results in distance vision comparable to an aspheric monofocal IOL.

The risk and dysphotopsia profiles are the same as a monofocal IOL. This IOL is best for patients who benefit from a slightly extended depth of focus (EDOF), such as computer and tablet usage.[2] Patients with retinal diseases such as macular degeneration, who would otherwise not be eligible for diffractive technology, are good candidates for this lens.[3]

Case 1

A 63-year-old woman with oblique astigmatism and a history of contact lens intolerance and conjunctivochalasis repair is interested in cataract surgery options for her left eye. She is concerned about night vision symptoms after surgery. She loves to play tennis and the piano and would like to have intermediate distance correction.

Solution: This patient's oblique astigmatism is corrected with a Tecnis Eyhance Toric. Using the Johnson & Johnson calculator with posterior corneal astigmatism (PCA) selected, an IOL that would leave +0.09 D residual astigmatism was selected. The final uncorrected VA was 20/20- and J3 for near after surgery.

This lens was chosen because it is very forgiving with oblique astigmatism while meeting the patient's needs, including intermediate distance needs. It also has frosted haptics that stabilize the lens and prevent it from rotating. If you decide to use the Barrett calculator, you may obtain a higher cylinder power as this calculator accounts for effective lens position and tilt.[5]

WAVEFRONT-SHAPING EDOF

The Acrysof IQ Vivity (Alcon) is a wavefront-shaping EDOF lens with two transition elements in the central 2.2-mm optical zone that cause changes in the wavefront. These transition elements help the incident beam have a uniform intensity to focus most of the light into the EDOF channel onto the retina. The first element is an elevated plateau (1 um in height) that stretches the wavefront element, and the second element is a slight curvature change that causes a shift in the wavefront. These two elements work together to extend the focal range. Due to the cornea's positive spherical aberration, the IOL's anterior surface is designed with negative spherical aberration to counteract this. This design results in a continuous extended focal range (Figure 1).[6,7]

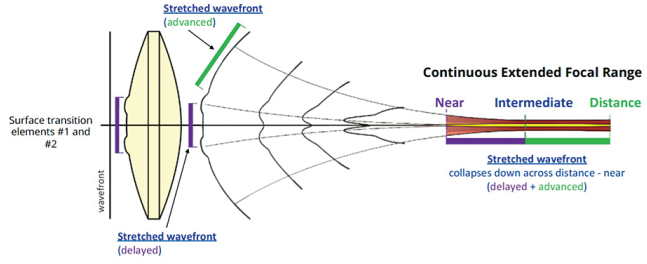

Figure 1. Wavefront-shaping technology creates a novel EDOF profile.[7]

This next-generation EDOF IOL works well for patients who want reduced spectacle dependence for activities. They live active lifestyles and enjoy intermediate visual functions. These patients are also risk-averse to visual disturbance.[8] Be cautious with

patients who have severe dry eye, retinal disease, irregular astigmatism, and moderate and severe glaucoma.

Case 2

A 65-year-old woman is seeking glasses independence after cataract surgery. She is concerned about multifocal IOLs as her neighbor had a multifocal lens inserted and can no longer drive at night due to halos and starbursts. She has dry eyes and is currently on lifitegrast. The patient has five cats and reported 11 allergic reactions. Her personality is type A. She is left eye dominant and has 2+ nuclear sclerotic cataracts (NSC) and healthy retinas OU. Her manifest refraction was OD -3.25 +1.00 175 and OS -3.75 +1.00 180.

Solution: The left eye, dominant, was operated on first to see how the patient would respond to the lens, and the Vivity toric IOL was selected. Postoperatively, the patient was happy with her distance and intermediate vision but complained that near vision was not great, so the Panoptix toric IOL was placed in the right eye. The patient's UCVA was 20/25-2 OD and 20/20 OS. Because the patient is concerned about dysphotopsia after surgery, an enhanced monofocal or an EDOF IOL is a better choice. Patient education and motivation play important roles.

SMALL APERTURE

The IC-8 (AcuFocus) is a small aperture IOL that allows central light rays to focus on the retina by filtering out unfocused and aberrated peripheral light. In a European Post-Market Study, patients were implanted contralaterally with a small aperture IOL and aspheric monofocal IOL. Participants achieved and maintained excellent binocular far and intermediate uncorrected visual acuity and good near acuity. Patients also reported low visual symptoms, with the highest mean symptoms of dryness and glare at 3 months postoperatively.[9]

These IOLs work best with patients who have been successful with monovision or multifocal contact lenses and do not want to wear eyeglasses. It reduces dysphotopsia and works well with patients who may have iris trauma, irregular cornea, scars, keratoconus, and complex cataract cases. It is forgiving of refractive surprises and can correct up to 1.50 D of residual astigmatism.[9] For patients with ocular surface disease, always treat and clear up the surface before surgery. Do not use in patients with any macular disease or proliferative diabetic retinopathy.

Case 3

Before cataract surgery, the patient was UCVA 20/30- OD and 20/20- OS at distance. Manifest refraction was OD +0.50-0.75x085 20/20 and OS -0.25 Sph 20/20-.

Solution: The plan for the patient was a monofocal IOL in the right eye with a target of plano and a small aperture IOL in the left eye with a target of -0.75 D. Postoperative UCVA was 20/20+ OD, J5 and OS 20/25+, J2. The patient was 20/20 and J1. This selection reduces loss of stereopsis and allows for easy and quick neuroadaptation.

HYBRID MULTIFOCAL/EDOF

The Tecnis Synergy (Johnson & Johnson Vision) is a hybrid multifocal/EDOF IOL that combines diffractive multifocal and EDOF technologies. It uses an echelette surface to improve light scatter and halo intensity. The achromatic technology enhances image contrast, and a violet filter reduces halo, glare, and starbursts. It provides excellent near vision and tolerance, delivers a higher contrast even under lower light conditions, and maintains quality of vision through a broad defocus range.[10-11]

These IOLs work best for patients seeking spectacle independence for distance, intermediate, and near, even under lower light conditions. These patients typically have hobbies that include reading, writing, cooking, crafts, and sewing. Be cautious of patients with irregular astigmatism, retina disease, severe dry eye, corneal dystrophies, and glaucoma. Also, be wary of irregular astigmatism sources such as epithelial basement membrane dystrophy, Salzmann nodular degeneration, and corneal scars.

Case 4

A 62-year-old woman presents with blurred vision, glare/halos, and difficulty reading in both eyes. She has dry eyes and meibomian gland dysfunction, with the left eye occasionally tearing, and she uses cyclosporine 0.05% drops. Her UCVA is 20/40 OD and 20/30 OS with 1+ NSC and 2+ cortical cataract (CC) in both eyes.

Solution: The Tecnis Synergy IOL was selected for both eyes because the patient was close to plano. She was 20/20 OD, 20/20- OS UCVA at distance, and J1 near OU. This lens works well for people who want good near and intermediate vision without sacrificing distance. Strive to use a lens power that is close to plano to first plus.

LIGHT ADJUSTABLE

The light adjustable lens (LAL; RxSight) is the only FDA-approved IOL that can be adjusted postoperatively. This unique lens allows cataract surgeons to adjust the final IOL power a few weeks after surgery. This lens allows for reduced dependence on IOL calculations.[12-13] The lens is available as a monofocal IOL, but future iterations may include EDOF/multifocal.

The lens consists of a polymerized photosensitive silicone macromer. The lens' power increases when the unpolymerized macromer migrates to the central portion of the lens, causing the central part of the IOL to thicken (Figure 2). Adjustment of the

Figure 2. UV light exposure fine-tunes the final IOL power.

"Rule out any eye comorbidities and treat residual refractive errors. Optimize the ocular surface and perform accurate biometry."

—Karolinne M. Rocha, MD, PhD

lens can correct down to 0.50 D cylinder. It utilizes built-in UV protection to help reduce the concern of patient compliance with sunglasses. The customized blended vision results in no increase in glare and halos.

This lens works well for post-refractive surgery patients who have had customized monovision or any cataract patient with effective lens position, posterior corneal astigmatism, or incisional healing. It also works well with anisometropia and astigmatism correction.

Case 5

A 62-year-old woman has a history of hyperopic LASIK in 2006 for +3.00 D hyperopia. She then had lift flap and laser OU in 2008. She also had astigmatic keratotomy OD and lift and laser OS in 2010. She has NSC in both eyes and wants multifocal implants.

Solution: Due to her history of multiple surgeries, it was best to avoid any surgery on the cornea. Her cornea aberration profile was also high. A light adjustable lens was selected for both eyes. This selection resulted in the right eye's refraction as plano and the left eye as -1.00 D.

CONCLUSION

Patient selection is critical. Rule out any eye comorbidities and treat residual refractive errors. Optimize the ocular surface and perform accurate biometry.

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Monovision: Rethinking and Refreshing the Fundamentals

Mini-Monovision IOLs

BY ELIZABETH YEU, MD

Monovision has been around for many years. Many optometrists and ophthalmologists have dabbled in monovision from contact lenses to LASIK to cataract surgery. Monovision has a somewhat polarizing reputation due to reduced stereopsis and is considered intolerable due to large anisometropia of 2.50 D. However, pseudophakic mini-monovision is an inexpensive way to achieve spectacle independence postcataract surgery.[1]

In mini-monovision, the dominant designation is for the distance eye, and the nondominant eye is for intermediate and near. Mini-monovision aims for anisometropia that is around -1.00 to -1.50 D, which reduces the unwanted side effects while

"Mini-monovision aims for anisometropia that is around -1.00 to -1.50 D, which reduces the unwanted side effects while providing spectacle independence."

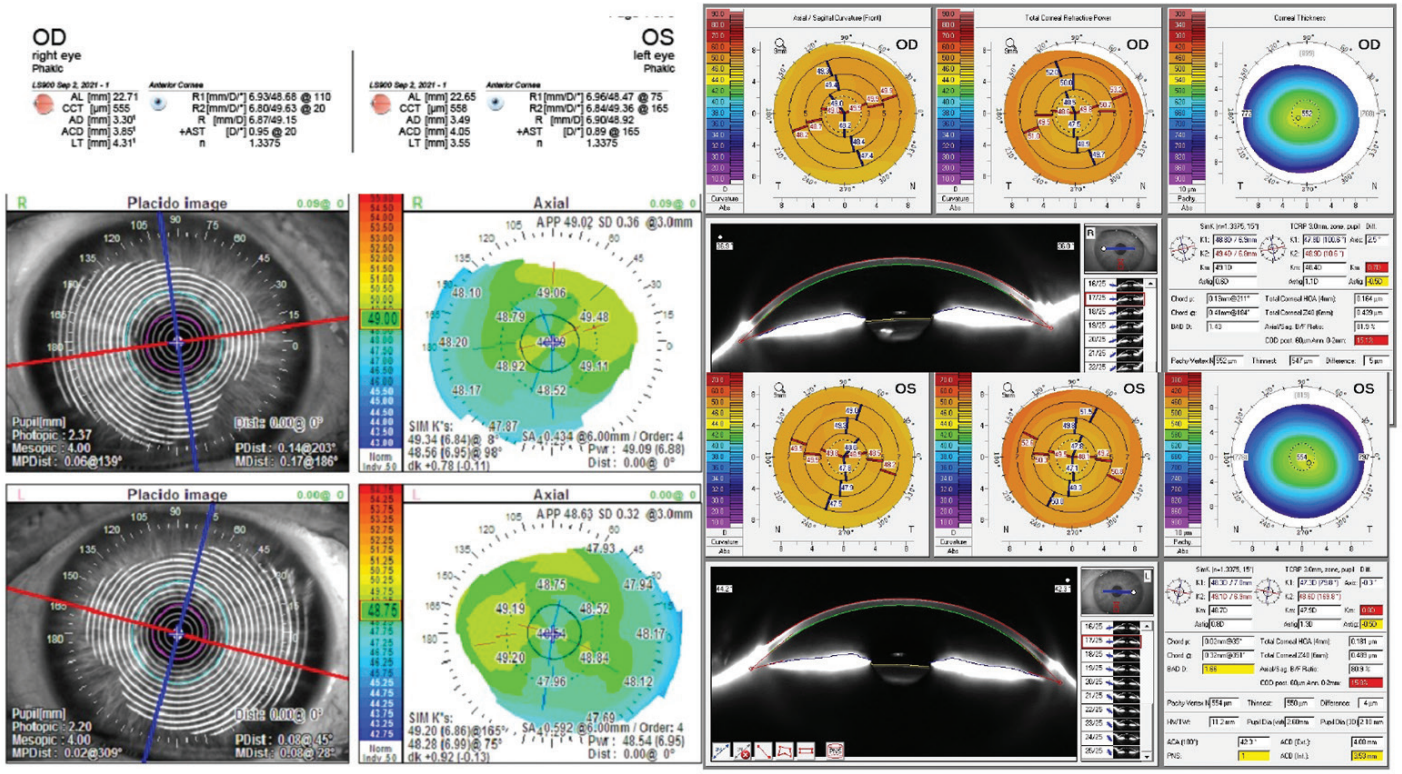

Figure 1. Case 1 – Corneal topography.

providing spectacle independence. It helps avoid the glare and halos associated with multifocal IOLs in sensitive patients and avoids IOL exchange issues.[1] This article will help you view monovision in a different light.

Case 1: A Healthy Retina

A 61-year-old woman has glare that is worsening. She is a high school teacher but cannot recognize her students' faces readily. She is wearing monovision contact lenses. Her right eye is plano (dominant), and her left eye is -1.50 D (nondominant). She has a desire to have sharp distance and range of vision as she loves to read books. Her job requires her to be able to look over her student's shoulders when they are working on the computer, and she is petite at 5'2."

Her manifest refraction reveals that she is 20/25 in her right eye and 20/30 in the left. OD -1.50 + 0.50 x 020 and OS -2.75 + 1.50 x 140. She has a healthy ocular surface with a tear breakup time of 10 seconds, easy to express meibum with no floppiness, a SPEED score of 4, and 1+ conjunctivochalasis. Her lenses are 2+ sclerotic nuclear cataracts (NSC) with 3+ cortical vacuoles. Her posterior ocular findings are unremarkable. Her total corneal astigmatism on topography is OD 1.1 D @ 10° and OS 1.3 D @ 170° (Figure 1).

The patient has steep average K values and should be counseled on the possibility of dysphotopsia. She is a candidate for any lens that captures her interest. Her options include monovision, extended depth of focus lens (EDOF)—refractive, diffractive, or small aperture—and multifocal and hybrid multifocal/EDOF IOLs.

Solution: The patient was fitted with Tecnis Synergy (Johnson & Johnson Vision), a hybrid multifocal/EDOF IOL that combines diffractive multifocal and EDOF technologies. The patient was plano 20/20 post-cataract surgery at distance. Her uncorrected near visual acuity (UCNVA) was J2 OD and J1+ OS. Her uncorrected intermediate distance visual acuity (UCIVA) was 20/16 OD and 20/12.5 OS. It is essential always to go first plus for patients like this, that is, to make the patient slightly hyperopic.

WHAT IF THE PATIENT HAD A RETINA ISSUE?

Case 2: An Unhealthy Retina

Imagine the same patient as in case 1, but now she has an epiretinal membrane with pucker in her left eye (Figure 2). She has prophylactic sub-Tenon's triamcinolone (0.2 mL of 40 mg/mL). What would her IOL options be now?

Solution: Because she has a retinal issue, the left eye will receive an enhanced monofocal toric IOL with a goal of -1.50 to -1.75 D. Her right will receive an enhanced monofocal toric IOL with a goal of plano to first plus. This choice will allow her to have a range of vision from intermediate to near that is closer to her previous phakic monovision.

If the patient had a healthy macula but had a goal of good distance vision, the IC-8 (AcuFocus) small aperture lens would be an excellent option for her. The small aperture lens can correct up to 1.50 D corneal astigmatism without worrying about alignment

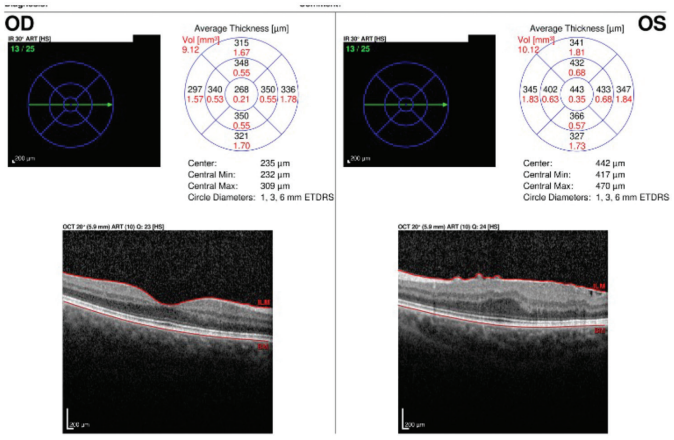

Figure 2. Case 2 – Macula OCT.

in the nondominant eye.[2] This IOL selection will allow the patient to have distance vision around 20/30-20/40, better stereopsis, and overall good quality of vision because there is no compromise in binocular contrast sensitivity.

Mini-monovision should be approached differently depending on the patient's refractive error. For hyperopes, always perform a contact lens trial as they will lose a bit of their distance vision for sharper near vision. Myopes already have decreased distance vision, which may allow for more wiggle room if needed, and don't necessarily need a trial. And, of course, if the patient is already a monovision contact lens wearer, they will adapt quickly.[1]

> *"Mini-monovision should be approached differently depending on the patient's refractive error."*

CONCLUSION

Technology advancements will eliminate many awkward conversations we have with patients, from counseling them about possible side effects to the cost of lenses. With the increasing options, we can choose a lens that will help them achieve their goal of a spectacle-free lifestyle.

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Mastering Presbyopia Patient Conversations

Expanding patient options with pharmaceutical presbyopia drops and refractive IOLs

BY VANCE THOMPSON, MD

Presbyopia has a significant impact on quality of life. This impact includes functionality, aesthetics, falls, hip fractures, head injuries, mental health, and productivity.[1,2]

With the FDA approval of presbyopia pharmaceutical drops, the way we practice will change. More presbyopes will be coming to the office to have the drops prescribed instead of going to the local store for glasses. A comprehensive exam is imperative before starting patients on their drop journey. Investing time in direct-to-consumer marketing, including information for patients in newsletters, and engaging in thorough patient education will add value to your practice.

THE DRAWBACKS OF CURRENT PRESBYOPIA OPTIONS

The treatment options for presbyopia include spectacles, contact lenses, and surgery, and there are drawbacks to each one (Figure 1).[3]

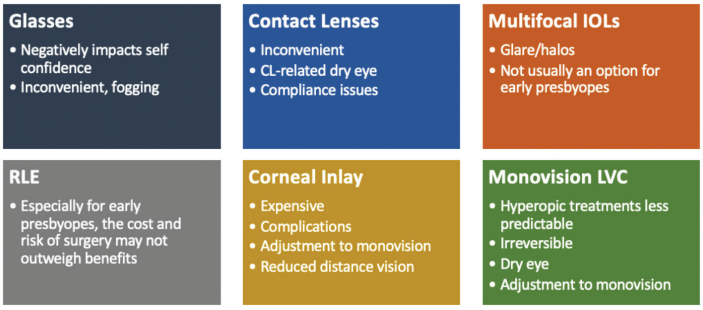

Figure 1. The drawbacks of current presbyopia options.

Expectations differ between an early presbyope interested in presbyopia pharmaceutical treatment and a late/advanced presbyope interested in a refractive IOL. It is common knowledge that accommodation reserve drops to 0 by 65, so the treatment plans

"Expectations differ between an early presbyope interested in presbyopia pharmaceutical treatment and a late/advanced presbyope interested in a refractive IOL."

should vary by age.[3-4]

There are needs and wants categories with refractive surgery, which will depend on many factors, including age, disease, and goals. The patient must choose between drops, optical, corneal surgery, or lens replacement with modern advancements. Other factors to consider are patient personality type, occupation, and the stage of lens dysfunction.

Treatment options will be dependent on the refractive endpoint. What is the desired image quality in terms of uncorrected image quality (UCIQ) and best-corrected image quality (BCIQ)? It is imperative to not only focus on visual acuity because an optimized image quality should be our goal. BCIQ is dependent on phoropter and gas permeable contact lenses. If the patient's vision clears with a gas-permeable lens, there is likely a corneal irregularity issue and/or dry eye. For BCIQ, always run a tear film analysis to rule out dry eye, which can contribute to blur.

PHARMACEUTICAL TREATMENT

When educating presbyopes about pharmaceutical treatments, it is best to review outcome expectations, usage considerations, cost, risk, and quality-of-life considerations (Figure 2). A patient with crisp vision at distance with no ocular disease will be a great candidate for drops. The goals of pharmaceutical presbyopia treatment should be considered when prescribing a drop.

Comanaging with ODs is another great way to incorporate pharmaceutical drops into your practice. ODs are most likely to encounter these patients earlier in life, and it is crucial to educate the area doctors, patients, and community. Start with a refractive workup and evaluate eye and tear film health and image quality. Remember that patient education is crucial and provide a consistent office and web experience.

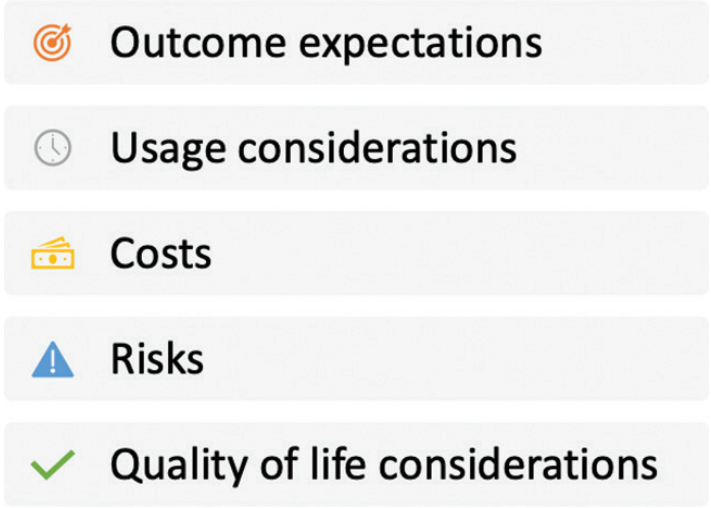

Figure 2. Educating presbyopes about pharmaceutical treatments.

CORNEAL REFRACTIVE SURGERY

Patients interested in presbyopic PRK, LASIK, and SMILE should be treated the same way as monovision patients. Again, remember that BCIQ is very important. For plano presbyopes desiring monovision, perform a monovision contact lens trial first to make sure the patient will be able to adapt to the change.[3] Also, educate them about their reduced stereopsis and ensure the cornea and tear film are healthy before surgery.

REFRACTIVE IOL

As technology advances, you should discuss the different options. You should also discuss that there is near vision improvement but there may be dysphotopsia concerns. You might also want to use presbyopia drops in conjunction with refractive IOLs.

Pseudoaccommodation is influenced in many ways. Small aperture optics are manipulated by controlling pupil size. Positive and negative spherical aberrations increase the depth of focus (DOF). Adding negative aberration is better due to the balance with defocus coma and other higher order aberrations that increase DOF. The contrast will reduce when adding aberrations. Cylinder correction can also influence accommodation and can be with or against the rule.[5-6]

Case 1: The Importance of Patient Education

A 47-year-old woman presents for her 3-month postoperative visit with complaints of near vision reduction. She had nuclear cataracts, and she was okay with bifocals as she had worn them since age 40 at her pre-surgery visit. She had aspheric monofocal implants inserted OU. Postoperatively, she is 20/20 OU at distance. She asks, "why didn't you talk me into that fancy implant?"

Solution: Because the patient is 20/20 at distance and seems happy with distance vision postoperatively, the addition of pharmaceutical drops will help her near vision. As always, patient education is crucial here. She feels she was not adequately educated on her options, and now is the time to review this with her. According to Greg N. Korneluk, "50 – 80% of the information provided by the clinician is instantly forgotten. Of the balance of information that is remembered, only 50% is remembered correctly.[7]" That is why taking time to educate these patients repeatedly on all of their options before surgery is so important.

Case 2: Presbyopia Pharmaceutical Drops for a Mild Myope

A 52-year-old woman is happy with her distance vision but frustrated with her near vision. At nighttime, she reports that her image quality is good. Manifest refraction is OD -0.25 -0.25 x 180 and OS -0.25 – 0.50 x 178. Her exam and diagnostics are normal.

Solution: Presbyopia-correcting drops are the best option for this patient because she is happy with her distance vision. It is best

> *"Treatment options will be dependent on the refractive endpoint."*

practice to counsel patients on any side effects they may experience with these drops.

Case 3: Presbyopia Pharmaceutical Drops in a Pseudophakic Patient

A 61-year-old man who is a truck driver presents for a cataract evaluation. He does not think his vision is too bad. He has some nighttime glare and his examining doctor said he did not pass his driving test. Manifest refraction is -1.25sph OU 20/25, but with the brightness acuity test (BAT), he is 20/50. He receives an aspheric monofocal implant in both eyes. Postoperatively he is -1.25 -0.25 x 180 OD and -1.25sph OS with 20/20 vision at distance. He is distraught about his loss of near vision.

Solution: Pharmaceutical presbyopia drops will be the best option for this patient to have near vision correction. In this situation, patient education is critical. Remind the patient that they are no longer nearsighted; thus, they will no longer have the crisp, clear near vision they are used to, but some of it will be restored with the drops.

CONCLUSION

Therapeutic treatment is covered by insurance, but the patient pays for refractive treatment. We need to understand the aspects of cash pay medicine. Presbyopia is a journey that starts at 40. It is essential to understand the different categories of presbyopia patients, including their concerns, expectations, and candidacy for each treatment option. Patient conversations can be time-consuming, but it will reduce patient unhappiness. As always, repeat, repeat, repeat. ■

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Increasing Your Happy Presbyopia Patients With the Latest Pharmaceutical and Surgical Options

Release Date: July 2022
Expiration Date: August 2023

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To receive credit, you must complete the attached **Pretest/Posttest/Activity Evaluation/Satisfaction Measures Form** and mail or fax to Evolve Medical Education LLC, 353 West Lancaster Avenue, Second Floor, Wayne, PA 19087; Fax: (215) 933-3950. To answer these questions online and receive real-time results, please go to https://evolvemeded.com/course/2212-supp. If you experience problems with the online test, email us at info@evolvemeded.com *NOTE: Certificates are issued electronically.*

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DEMOGRAPHIC INFORMATION

___ MD/DO
___ OD
___ NP
___ Nurse/APN
___ PA
___ Other

Years in Practice
___ >20
___ 11-20
___ 6-10
___ 1-5
___ <1

Patients Seen Per Week
(with the disease targeted
in this educational activity)
___ 0
___ 1-15
___ 16-30
___ 31-50
____ >50

Region
___ Midwest
___ Northeast
___ Northwest
___ Southeast
___ Southwest

LEARNING OBJECTIVES

Did the program meet the following educational objectives?	Agree	Neutral	Disagree
Define the prevalence, etiology, and key characteristics of progression of presbyopia from early to late-stage patients	_____	_____	_____
Outline strategies for finding, communicating with, and educating patients about presbyopia-correction clinical outcomes, costs, risks, and benefits, including quality-of-life and quality-of-vision considerations	_____	_____	_____
Describe how the latest presbyopia-correcting IOL technologies and pharmaceutical presbyopia treatments can address outcomes in a new group of presbyopia patients, including those with comorbid conditions	_____	_____	_____

POSTTEST QUESTIONS

Please complete at the conclusion of the program.

1. Based on this activity, please rate your confidence in your ability to educate patients with presbyopia on the latest IOLs and pharmaceutical options (based on a scale of 1 to 5, with 1 being not at all confident and 5 being extremely confident).

a. 1
b. 2
c. 3
d. 4
e. 5

2. A 45-year-old woman has begun to feel the effects of presbyopia. She has a history of prior LASIK surgery and is not ready for a refractive lens exchange. What is a good treatment option that will preserve both her near and distance vision and work with her active lifestyle?

a. Presbyopia drops
b. Monovision contact lenses
c. Multifocal contact lenses
d. Reading glasses

3. The VIVID study uses a combination of carbachol and brimonidine to treat presbyopia. What is the role of carbachol in this combination?

a. Increases bioavailbility of brimonidine
b. Acts as a miotic
c. Prevents onset of hyperemia
d. Acts as a dilator

4. What is a key consideration for presbyopia-correcting drops?

a. Minimize adverse effects
b. Maximize onset time
c. Minimize duration of effect
d. Maximize impact on ocular surface health

5. A 50-year-old patient with high myopia is interested in a presbyopia pharmaceutical treatment. You opt to do a full workup before prescribing the drops. You decide to do an OCT. What are you looking for?

a. Age-related macular degeneration
b. Vitreomacular traction
c. Glaucoma
d. Dry eye

6. A 60-year-old man who is a successful monovision contact lens wearer is having difficulty with glare and his cataracts are NSC +2 and CC +2. His ocular surface is healthy, but he has moderate macular degeneration in the right eye. He is worried about cost but still wants good vision at all three distances. What IOL would you recommend?

a. Monofocal IOL
b. Multifocal IOL
c. Extended-depth-of-focus (EDOF) IOL
d. Hybrid multifocal/EDOF IOL

7. What IOL is best at correcting up to 1.50 D of residual astigmatism?

a. Hybrid multifocal/EDOF IOL
b. Small aperture IOL
c. Light adjustable IOL
d. EDOF IOL

8. What IOL can be adjusted postoperatively?

a. Hybrid multifocal/EDOF IOL
b. Small aperture IOL
c. Light adjustable IOL
d. Enhanced monofocal IOL

9. What amount of anisometropia is acceptable in mini monovision?

a. 0.50-0.75 D
b. 1.00-1.50 D
c. 2.00-2.50 D
d. >3.00 D

10. What IOL would you recommend for a risk-averse patient who wants good intermediate distance correction?

a. Hybrid multifocal/EDOF IOL
b. Small aperture IOL
c. Wavefront-shaping EDOF IOL
d. Enhanced monofocal IOL

11. What is a drawback of multifocal IOLS?

a. Fogging
b. Dry eye
c. Glare and halos
d. Reduced distance vision

ACTIVITY EVALUATION

Your responses to the questions below will help us evaluate this activity. They will provide us with evidence that improvements were made in patient care as a result of this activity.

Rate your knowledge/skill level prior to participating in this course: 5 = High, 1 = Low_____

Rate your knowledge/skill level after participating in this course: 5 = High, 1 = Low_____

This activity improved my competence in managing patients with this disease/condition/symptom. _____ Yes _____No

Probability of changing practice behavior based on this activity: _____High _____ Low _____No change needed

If you plan to change your practice behavior, what type of changes do you plan to implement? (check all that apply)

Change in pharmaceutical therapy _____
Change in nonpharmaceutical therapy _____
Change in diagnostic testing _____
Choice of treatment/management approach _____
Change in current practice for referral _____
Change in differential diagnosis _____
My practice has been reinforced _____
I do not plan to implement any new changes in practice _____

Please identify any barriers to change (check all that apply):

_____ Cost
_____ Lack of consensus or professional guidelines
_____ Lack of administrative support
_____ Lack of experience
_____ Lack of time to assess/counsel patients
_____ Lack of opportunity (patients)
_____ Reimbursement/insurance issues
_____ Lack of resources (equipment)
_____ Patient compliance issues
_____ No barriers
_____ Other. Please specify: _____

The design of the program was effective for the content conveyed	___ Yes	___ No
The content supported the identified learning objectives	___ Yes	___ No
The content was free of commercial bias	___ Yes	___ No
The content was relative to your practice	___ Yes	___ No
The faculty was effective	___ Yes	___ No
You were satisfied overall with the activity	___ Yes	___ No
You would recommend this program to your colleagues	___ Yes	___ No

Please check the Core Competencies (as defined by the Accreditation Council for Graduate Medical Education) that were enhanced through your participation in this activity:

_____ Patient Care
_____ Medical Knowledge
_____ Practice-Based Learning and Improvement
_____ Interpersonal and Communication Skills
_____ Professionalism
_____ System-Based Practice

Additional comments:

_____

_____ I certify that I have participated in this entire activity.

This information will help evaluate this activity; may we contact you by email in 3 months to inquire whether you have made changes to your practice based on this activity? If so, please provide your email address below.

_____

_____