



A continuing medical education activity provided by Evolve Medical Education LLC.  
This activity is supported by an unrestricted educational grant from Alcon.

# ***KOL KNOCKOUT™* CATARACT EDITION:** Heavy Hitters Discuss Using Next-Generation Technologies to Maximize Outcomes in Complex Cases



**GARY WÖRTZ, MD,**  
PROGRAM CHAIR



**ASHLEY BRISSETTE, MD,**  
MSC, FRCSC



**PREEYA K. GUPTA, MD**



**JAMES C. LODEN, MD**



**NEDA SHAMIE, MD**



**WILLIAM B. TRATTLER, MD**



**ROBERT J. WEINSTOCK, MD**



**WILLIAM F. WILEY, MD**

CRST CRST EUROPE MILLENNIALEYE  
Cataract & Refractive Surgery Today    Cataract & Refractive Surgery Today

Distributed with

# KOL KNOCKOUT™ CATARACT EDITION: Heavy Hitters Discuss Using Next-Generation Technologies to Maximize Outcomes in Complex Cases

## Faculty

### Gary Wörtz, MD, Program Chair

Founder and Chief Medical Officer  
Omega Ophthalmics  
Private practice  
Commonwealth Eye Surgery  
Lexington, KY

### Ashley Brissette, MD, MSc, FRCSC

Assistant Professor of Ophthalmology  
Weill Cornell Medicine  
New York Presbyterian Hospital  
New York, NY

### Preeya K. Gupta, MD

Managing Director  
Triangle Eye Consultants  
Raleigh, NC

### James C. Loden, MD

President, Loden Vision Centers  
Nashville, TN

### Neda Shamie, MD

Cataract, Refractive, and Corneal Surgeon  
Maloney-Shamie Vision Institute  
Los Angeles, CA

### William B. Trattler, MD

Cornea, Cataract and Refractive Surgeon  
Center for Excellence in Eye Care  
Clinical Associate Professor  
Herbert Wertheim College of Medicine  
at Florida International University  
Miami, FL

### Robert J. Weinstock, MD

Private practice  
The Eye Institute of West Florida  
Largo, FL

### William F. Wiley, MD

Medical Director  
Cleveland Eye Clinic  
Division of Midwest Vision Partners  
Cleveland, OH

## Content Source

This continuing medical education (CME) activity captures content from three live-virtual symposia.

## Activity Description

This supplement summarizes content from a series of three unique, live-virtual symposia hosted by Gary Wörtz, MD. The game show-style quiz competition with real-time audience voting featured cataract-focused case studies and discussions regarding patient care and surgical approaches among key opinion leaders/contestants.

## Target Audience

This certified CME activity is designed for ophthalmologists.

## Learning Objectives

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

- **Identify** the potential benefits and drawbacks of using femtosecond laser technology for cataract and refractive surgery
- **Discuss** advances in adjunctive technologies for cataract surgery and how they can be used to improve refractive outcomes
- **Compare** advanced intraocular lenses for cataract and refractive surgery patients to properly counsel patients and create personalized treatment plans based on patient expectations

## Grantor Statement

This activity is supported by an unrestricted educational grant from Alcon.

## Accreditation Statement

Evolve Medical Education LLC (Evolve) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The American Medical Association has an agreement of mutual recognition of CME credits with the European Union of Medical Specialists (UEMS), the accreditation body for European countries. Physicians interested in converting AMA PRA Category 1 Credit™ to UEMS-European Accreditation Council for Continuing Medical Education CME credits (ECMEC®s) should contact the UEMS at mutualrecognition@uems.eu. Activities certified for AMA PRA Category 1 Credit™ that take place within a member country of the UEMS are not eligible for conversion to ECMEC®s under this agreement.

## Credit Designation Statement

Evolve designates this enduring material for a maximum of 1 AMA PRA Category 1 Credit™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

## To Obtain Credit

To obtain credit for this activity, you must read the activity in its entirety and complete the Pretest/Posttest/Activity Evaluation/Satisfaction Measures Form, which consists of a series of multiple-choice questions. To answer these questions online and receive real-time results, go to <https://evolvemeded.com/course/2233-sup>.

Upon completing the activity and self-assessment test, your certificate will be available. Alternatively, please complete the Posttest/Activity Evaluation/Satisfaction Form and mail or fax to Evolve Medical Education LLC, 353 West Lancaster Avenue, Second Floor, Wayne, PA 19087; Fax: (215) 933-3950.

## Disclosure Policy

It is the policy of Evolve that faculty and other individuals who are in the position to control the content of this activity disclose any real or apparent financial relationships relating to the topics of this educational activity. Evolve has full policies in place that will identify and mitigate all financial relationships prior to this educational activity.

The following faculty/staff members have the following financial relationships with ineligible companies:

**Ashley Brissette, MD, MSc, FRCSC**, has had a financial relationship or affiliation with the following ineligible companies in the form of *Consultant*: Alcon, Bausch + Lomb, Carl Zeiss Meditec, Glaukos, Johnson & Johnson Vision, Novartis, RxSight, Sun Pharmaceutical Industries, and TearLab. *Grant/Research Support*: Alcon.

**Preeya K. Gupta, MD**, has had a financial relationship or affiliation with the following ineligible companies in the form of *Consultant*: Alcon, Aldeyra, Allergan, Azura, Carl Zeiss Meditec, Expert Opinion, HanAll Biopharma, Johnson & Johnson Vision, Kala Pharmaceuticals, New World Medical, Novartis, Ocular Science, Ocular Therapeutix, Orasis, Oyster Point, Sight Sciences, Spyglass, Sun Pharmaceutical Industries, Surface Ophthalmics, TearClear, TearLab, TissueTech, and Visionology.

**James C. Loden, MD**, has a financial agreement or affiliation with the following ineligible companies in the form of *Consultant*: Johnson & Johnson Vision and Lensar. *Grant/Research Support*: Bausch + Lomb, Lenstec, and Johnson & Johnson Vision. *Speaker's Bureau*: Johnson & Johnson Vision.

**Neda Shamie, MD**, has had a financial agreement or affiliation during the past year

with the following commercial interests in the form of *Consultant*: Alcon, Allergan, Avellino, Glaukos, Staar Surgical, and Tarsus.

**William B. Trattler, MD**, has had a financial relationship or affiliation with the following ineligible companies in the form of *Consultant*: Alcon, Allergan, Avellino, Azura Ophthalmics, Bausch + Lomb, Beaver-Visitec International, Bio-Tissue, Carl Zeiss Meditec, Glaukos, Johnson & Johnson Vision, Kala Pharmaceuticals, Lensar, Oculus, Sight Sciences, and Sun Ophthalmics. *Speaker's Bureau*: Alcon, Allergan, Avellino, Bausch + Lomb, Beaver-Visitec International, Carl Zeiss Meditec, Johnson & Johnson Vision, Kala Pharmaceuticals, Lensar, Oculus, Sight Sciences, and Sun Ophthalmics. *Stock/Shareholder*: ArcScan and Visionary Fund.

**Robert J. Weinstock, MD**, has had a financial relationship or affiliation with the following ineligible companies in the form of *Consultant*: Alcon, Bausch + Lomb, Beyeonics, EyePoint Pharmaceuticals, Johnson & Johnson Vision, Lensar, and Visus. *Speaker's Bureau*: Johnson & Johnson Vision. *Stock/Shareholder*: Eyesafe, RPS, RxSight, TissueTech, uBeam, and Visus.

**William F. Wiley, MD**, has had a financial relationship or affiliation with the following ineligible companies in the form of *Consultant*: Alcon, Allergan, Bausch + Lomb, Carl Zeiss Meditec, Dompé, Imprimis, and RxSight.

**Gary Wörtz, MD**, has had a financial relationship or affiliation with the following ineligible companies in the form of *Consultant*: Alcon, Bausch + Lomb, Carl Zeiss Meditec, Johnson & Johnson Vision, Lensar, and OcuPhire. *Speaker's Bureau*: Avellino. *Stock/Shareholder*: Arcuate Innovations and Omega Ophthalmics.

## Editorial Support Disclosures

The Evolve staff, planners, reviewer, and writers have no financial relationships with ineligible companies.

## Off-Label Statement

This educational activity may contain discussion of published and/or investigational uses of agents that are not indicated by the FDA. The opinions expressed in the educational activity

are those of the faculty. Please refer to the official prescribing information for each product for discussion of approved indications, contraindications, and warnings.

## Disclaimer

The views and opinions expressed in this educational activity are those of the faculty and do not necessarily represent the views of Evolve, *Cataract & Refractive Surgery Today*, *Cataract & Refractive Surgery Today Europe*, *MillennialEYE*, or Alcon.

This activity is designed for educational purposes. Participants have a responsibility to utilize this information to enhance their professional development to improve patient outcomes. Conclusions drawn by the participants should be derived from careful consideration of all available scientific information. The participant should use his/her clinical judgment, knowledge, experience, and diagnostic decision-making before applying any information, whether provided here or by others, for any professional use.

## Digital Edition



To view the online version of the material, log in to your Evolve account and go to <https://evolved.com/course/2233-sup> or scan the QR code

with your smartphone's camera.

To view the webinars associated with this supplement, log in to your Evolve account and go to: <https://www.evolved.com/course-group/kol-knockouttm-cataract-edition-improving-postoperative-outcomes-through-advances-in-aberrometry-femtosecond-lasers-and-iols>.



## 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 improve postoperative outcomes in cataract/refractive surgery (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. How many diopters of cylinder can be treated postoperative with a Light Adjustable Lens (LAL)?**

- A. Up to 0.5 D
- B. Up to 1.0 D
- C. Up to 1.5 D
- D. Up to 2.0 D

**3. A 38-year-old man with a traumatic cataract presents to your office for evaluation. He desires an intraocular lens implanted that gives him good distance and intermediate vision. Which of the following is the best choice?**

- A. Nondiffractive extended depth of focus lens
- B. Monofocal lens
- C. Monofocal toric lens
- D. 3-piece monofocal lens

**4. You are evaluating a 66-year-old woman with high hyperopia. Her Mrx is +8.25 -3.50 x 11 OD and +8.75 -1.00 x 160 OS. She wants the best distance vision possible, which would call for a lens of about 40 D. Which of the following statements about her management is TRUE?**

- A. 40 D toric lenses are readily available
- B. Using femtosecond laser to image the cataract can help assess if the capsule would allow for a piggyback lens
- C. A piggyback IOL is not a good option for this patient
- D. A piggyback IOL cannot be performed with a LAL in this patient

**5. What are patients with small eyes at particular risk for?**

- A. Choroidal effusions and choroidal hemorrhages
- B. Intraoperative floppy iris syndrome
- C. Posterior capsular rupture
- D. Retinal tears and breaks

**6. A 38-year-old man presents for evaluation of a traumatic cataract. What problem might you anticipate if using a premium lens?**

- A. Poor lens centration
- B. Higher risk of retinal tears/detachment
- C. Higher risk of endothelial compromise
- D. Higher risk of UGH syndrome



# KOL KNOCKOUT™ CATARACT EDITION: Heavy Hitters Discuss Using Next-Generation Technologies to Maximize Outcomes in Complex Cases

**C**ataract and refractive surgery are rapidly evolving fields. Developments in femtosecond laser technology, enhanced preoperative assessments, and next-generation IOLs give surgeons more surgical predictability and the ability to customize treatments based on patient preferences and needs. In refractive surgery, the femtosecond laser has applications for both myopia and presbyopia correction.<sup>1</sup> Advancements in IOL technology have increased the variety of IOLs available and improved outcomes in cataract surgery and presbyopia correction compared with monofocals, especially in patients with a high degree of astigmatism.<sup>2</sup> Premium IOLs, including multifocal and extended depth of focus (EDOF) lenses, provide patients with good-to-acceptable distance, intermediate, and near vision with high patient satisfaction rates.<sup>3-6</sup>

Captured from a series of three live-virtual “knockout rounds,” the following cases bring together thought leaders in cataract and refractive surgery to discuss complex cases that use different adjunctive technologies and how they can be used together to improve refractive outcomes. We’ll also compare and discuss the pros and cons of different lenses for cataract and refractive surgery, how to counsel patients based on their specific needs, and how to create personalized treatment plans based on patient expectations.

—Gary Wörtz, MD, Program Chair

## ROUND 1 | CASE 2: THE AMBLYOPE

**Dr. Wörtz:** This case is a 50-year-old white man with anisometropia resulting in amblyopia of 20/40 BCVA OS. His right eye corrects to 20/15. He has slight hyperopia in the right eye but is very hyperopic with some astigmatism in his left eye, about a 4.0 D difference between the two eyes. Because of this disparity, he’s having difficulty reading with glasses and difficulty seeing with bifocals, and he wants to have maximum spectacle independence. He is extremely unhappy with glasses, taking them on and off, and he has not been able to find a satisfactory solution. This patient told me that he generally ignores his left eye and

sees everything out of his right eye. His left eye is the bonus eye. He’s used to seeing mostly out of his right eye.

He has very little astigmatism and very little higher order aberrations in the right eye (Figure 1A/B). His mires test looks good, and he has a pretty clean OPD scan. The biometer<sup>7</sup> (Figure 1C) shows a shorter axial length in the right eye than in the left eye, which obviously gives us the anisometropia, and he has about 4.0 D difference in the recommended IOL.

Figure 2A shows an arcuate incision plan that can be used if needed for correcting astigmatism. Toric calculators are also available (Figure 2B).<sup>8,9</sup>

**Q | Dr. Wörtz:** Dr. Trattler, when you have someone with a weak eye but still pretty good vision, what are your concerns, and how do you approach it?

**William B. Trattler, MD:** We see these patients often in our clinic, and they wonder if there’s anything we can do to make their vision better. Like you mentioned with this patient, I’ve learned that many patients suppress the weak eye; they don’t use it. They get some information such as peripheral vision and binocularity in some respects, but they’re not seeing the sharpness that comes from their other eye. I don’t worry as much about the weak eye as far as what our result will be. If there’s a little bit of astigmatism, that’s okay. It’s really about achieving excellent, uncorrected vision in their good eye that’s going to be the most important.

**Preeya K. Gupta, MD:** I think the key in this case is that the patient is hyperopic. They are not going to have excellent near vision, and that’s the chief complaint, as he’s having a difficult time with bifocals. You want to focus on the visual outcome of the nonamblyopic eye. I consider trifocality in these patients. Their amblyopic eye won’t have as good of vision as their nonamblyopic eye, but I have seen improvement with this approach; they might gain a line or more of vision.

The hardest question to answer, which you can’t until you’ve

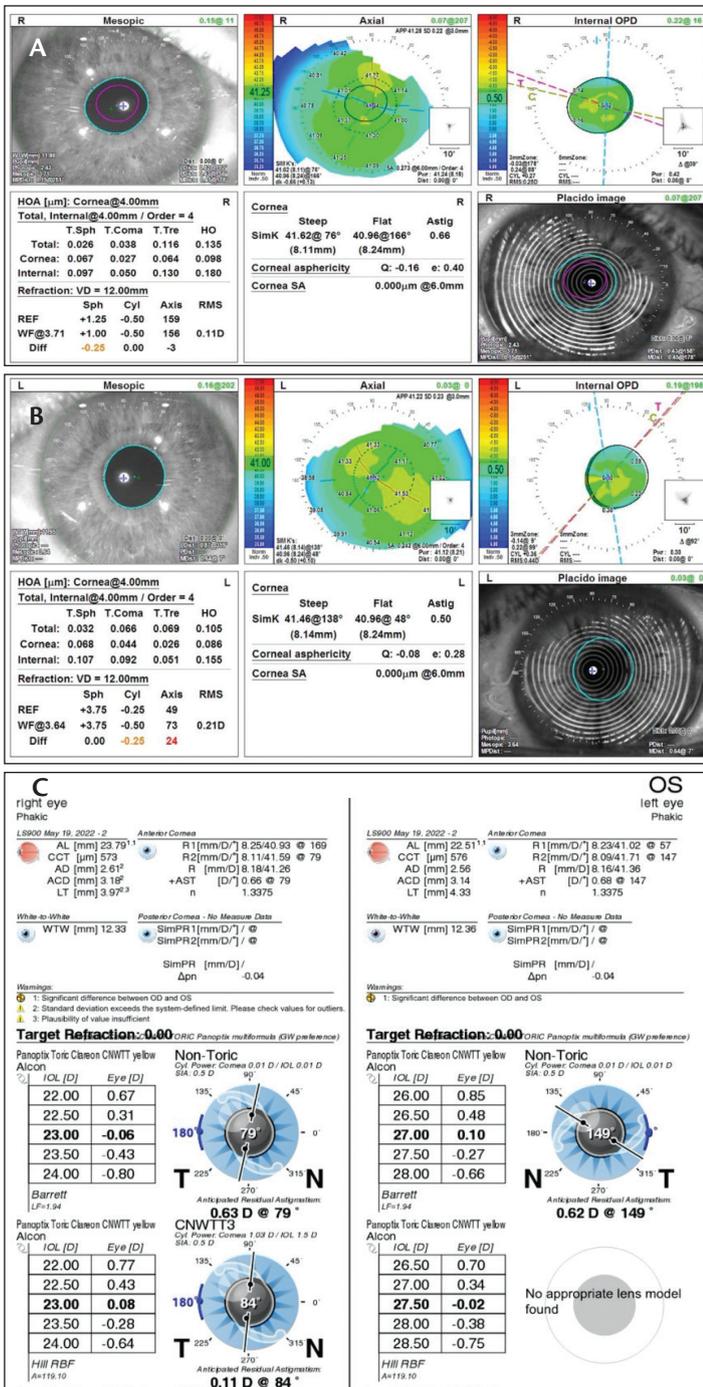


Figure 1. Baseline measurements.

made a treatment decision, is are they going to be able to suppress the bad eye? I've had some patients lose that constant suppressive tone in the amblyopic eye, and I warn them about the possibility of double vision.

**Robert J. Weinstock, MD:** Philosophically, we have a high-risk situation because this is a one-eyed patient, as he does not have the potential to correct to 20/20. VA of 20/40 may appear acceptable

on the exam chart, but in the real world, the eye isn't useful, and his brain isn't functioning correctly. If you correct the eye, it may cause visual confusion. If there is a complication in his good eye, he won't have a happy life with 20/40 VA. There's a lot of risk here. I am not in favor of elective procedures on one-eyed patients in general. I let patients know that they will only have one good eye for the rest of their life. These are touchy, delicate situations. I like to take my time and work through these cases before moving to surgery. It would not be my initial recommendation.

**Dr. Gupta:** I'd offer this patient the PanOptix Trifocal IOL<sup>10-12</sup> OU with femtosecond laser, and I'd correct the astigmatism at the same time. Although I worry about refractive accuracy in these patients, this patient didn't have extreme axial length or K measurements, therefore, I feel more confident that we will hit our refractive target. Hyperopic, presbyopic patients are some of my happiest trifocal patients.<sup>13</sup> But you do have to reach the refractive target in the nonamblyopic eye.

**Dr. Trattler:** How well is this patient going to see with a PanOptix Trifocal IOL in his amblyopic eye? I've avoided placing a multifocal lens in this type of eye because they aren't going to get the benefit, and it's expensive. Wouldn't it be better to use a monofocal lens in that eye?

**Dr. Gupta:** Definitely not. I shouldn't make that decision for the patient. If a patient is fine with reading glasses, then femto monofocal could be a sweet spot. No, we won't fix the amblyopic eye with surgery, and the patient needs to understand that. But we aren't making his vision worse by putting in a trifocal. If they hate it, we can take it out. I've had enough patients achieve better vision after I've done a femto multifocal that I believe this patient can perceive a benefit.

**Dr. Trattler:** A contact lens trial makes a lot of sense. I agree with Dr. Weinstock's assessment that this is a monocular patient. Unfortunately, there are risks during surgery that are beyond everyone's control. Therefore, I tend to be a little bit more conservative for intraocular surgery in this type of situation. It depends on the patient. If the patient tries contacts and is contact lens intolerant, then I'd consider surgery.

**Dr. Wörtz:** To give everyone a little more information, this patient wanted refractive surgery in 2018. We told him it wasn't the right time and to come back. Surgery was scheduled right before the COVID-19 pandemic and was cancelled. It's been 4 years, and this is the third time he's asked about this. Would you consider doing lens-based surgery just in his amblyopic eye to balance him out?

**Dr. Trattler:** I would do a contact lens trial. If he was happy with either a single-vision lens or a multifocal contact lens, then I'd consider surgery on his amblyopic eye only.

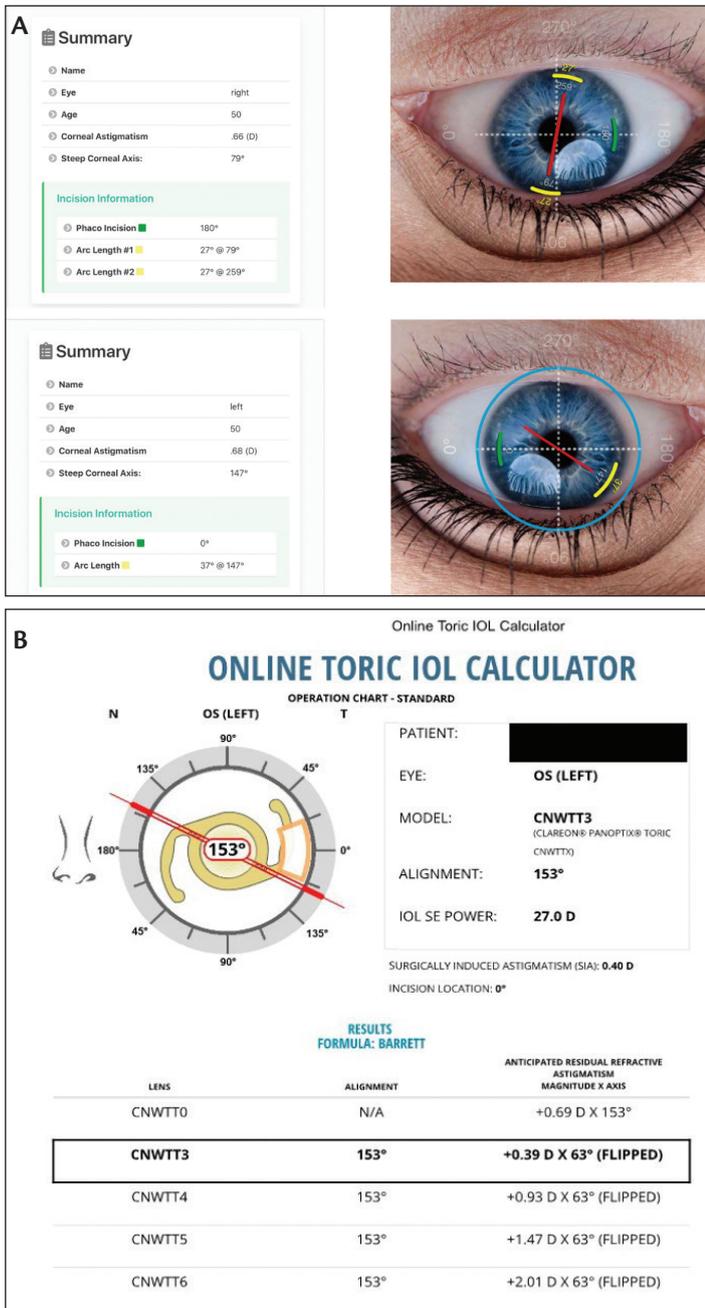


Figure 2. Arcuate incision plan for correcting astigmatism (A) and toric IOL calculator (B).

**Dr. Weinstock:** For his amblyopic eye, would you make it distance or would you give him a little near vision?

**Dr. Trattler:** What's the success rate of monovision contact lenses in a patient with an amblyopic eye? I don't think it's very high. Certainly, we could try.

**Dr. Weinstock:** I would not use a multifocal in someone with one eye with good vision and an amblyopic eye. I am not comfortable implanting a multifocal lens in someone who has

uncorrected 20/20 vision or who is correctable to 20/20.

**Dr. Gupta:** I agree with you, but he's not a happy 20/20 patient. He's complaining bitterly, and he's back again trying to get a solution 4 years later.

**Dr. Wörtz:** Yes, he's having trouble functioning because of it.

**Dr. Weinstock:** The anisometropia could be a big part of the issue. If you just did surgery on one eye and corrected him close to the other one, that might put them both in balance. Therefore, when he wears glasses, he may feel more comfortable.

**Dr. Gupta:** That's a good point. Even though his amblyopic eye has a limited BCVA, I usually start with the amblyopic eye in these cases, because it's not a big sell. The eye isn't functioning anyway, therefore if they hate the trifocal in the amblyopic eye, we don't have to do the other one.

**Dr. Wörtz:** These are amazing pearls, and I love hearing how the panel is processing this case. I didn't want to bias anyone's opinion, but I will say that my view was very different. Dr. Weinstock, I did not view this patient as monocular. I think your point is well taken, but my view is if someone has 20/40 VA or better, then they could potentially function in their life with only one eye. If he had a higher amount of amblyopia, I think my plan would be different.

Dr. Gupta, prior to this, I don't know that I'd ever put in a trifocal lens in an amblyopic eye. I always had concerns about it, and my experience with PanOptix has been overwhelmingly positive. Dr. Weinstock, to your other point about recommending surgery on the first visit, that was not the case. He had been in and out of our clinic, and we tried different things.

I used bilateral PanOptix on this patient, but we did the amblyopic eye first. We told him that we would try to get his eyes in balance, see how he did, and then make a plan after the first eye surgery was complete. He was absolutely thrilled. He gained some vision in the first eye, going from VA 20/40 to 20/40+2. He's still healing, so he may continue to gain vision. After surgery on the second eye, he's now 20/20 J1+, and he is very happy.

Sometimes you get these cases and scratch your head, wondering if you're doing the right thing. I really wanted to help him. To Dr. Gupta's point, if their amblyopia is not so dense, they can get some benefit from a multifocal lens. That said, if you're new to multifocal lenses in refractive cataract surgery, this is not the first patient you try it with.

**Dr. Trattler:** Impressive case. I definitely learned something that I would not have necessarily done before, so thanks for sharing.

**ROUND 1 | CASE 3: THE YOUNG HIGH HYPEROPE**

**Dr. Wörtz:** Our next case is a 27-year-old woman who presented for a refractive surgery consultation. The first thing I

TABLE. BASELINE MEASUREMENTS.

MEASUREMENT	OD	OS
Visual acuity	+10.25 -6.25 x 174 with a BCVA of 20/30+2	+7.25 -5.00 x 005 with a BCVA of 20/20-
Keratometry by OPD	38.35 x 44.29 steep at 86 (5.94 D)	38.93 x 43.89 steep at 100 (4.96 D)
Keratometry by Lenstar	38.24 x 44.45 steep at 85 (6.32 D)	39.04 x 44.63 steep at 99 (5.54 D)
Axial length by Lenstar	21.07 mm	21.55 mm
Central corneal thickness	493 µm	501 µm
ACD	3.13 mm	3.10 mm
IOL calculations	33.5 D ZCT600 OD with a -0.06 D spherical equivalent and 2.20 D of residual astigmatism	31.5 D ZCT600 OS with a -0.31 D spherical equivalent and 1.60 D of residual astigmatism

noticed was her incredibly thick glasses and the air of depression over her. She has a history of high hyperopia, high regular astigmatism, and mild amblyopia OD that was treated with patch occlusion when she was a child. Despite treatment with glasses and contact lenses, she complains of poor vision, both at distance and near, that is getting progressively worse. She has become contact lens intolerant after wearing contacts for 16 hours a day, every day, and is no longer comfortable driving due to the distortion caused by her glasses. Her poor vision is affecting her quality of life and is a major stressor in her life; her glasses are not working well for her. Her measurements are summarized in the Table. She has a very short eye, and her IOL calculations are odd. This case is from several years ago, before trifocals were available in the United States.

If we used the highest power toric IOL, the TECNIS Toric, it would leave her with 2.2 D residual astigmatism in the right eye and 1.6 D residual astigmatism in the left eye. It's regular astigmatism, but it's high.

Figure 3 shows the Donnenfeld nomogram, which is calling for a very large, 75° and 55° arcs, and this is inputting the residual astigmatism, not the original astigmatism.

**Q | Dr. Wörtz:** Dr. Gupta, what is your plan for this patient?

**Dr. Gupta:** If you can leave this patient myopic with a toric lens, I would do -0.75 D or -1 in her dominant eye and a -2 in her nondominant eye. Those are glasses that you can live with and that you can put on to drive.

**Dr. Trattler:** The highest any toric lens goes to is a 34.

**Dr. Wörtz:** We can't leave her nearsighted.

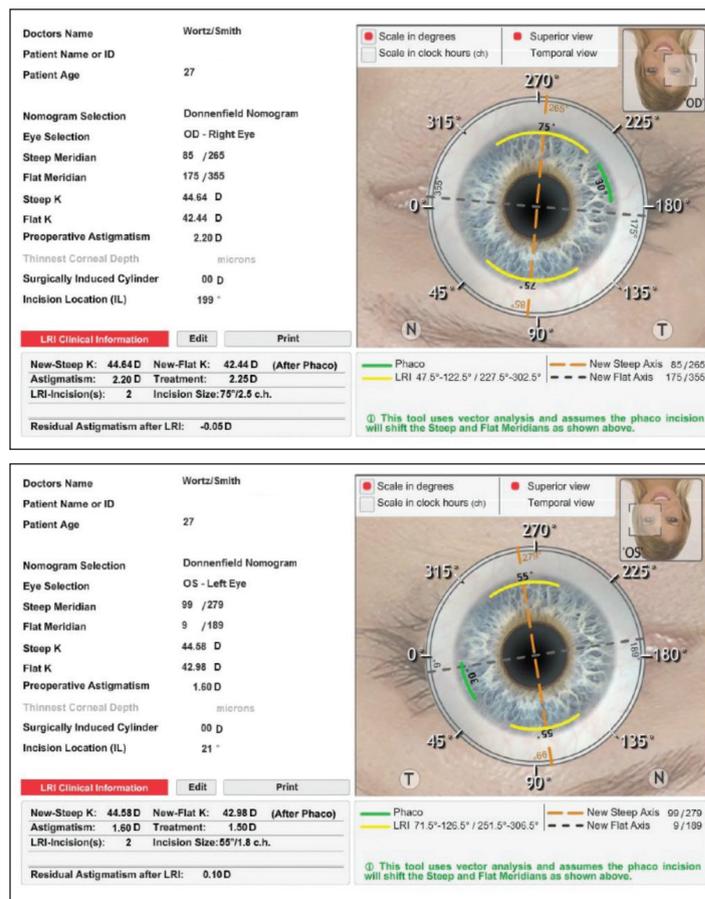


Figure 3. Baseline Donnenfeld nomogram.

**Dr. Gupta:** You could leave her slightly nearsighted in the left eye. Give her close to plano in the right eye, and then give her -1.50 in the left eye.



**Dr. Wörtz:** Even though her BCVA is 20/30 in her right eye?

**Dr. Gupta:** I can't imagine leaving a 27-year-old patient plano, OU. She's not going to be happy with that. She will be stuck with progressive glasses 24/7. She will hate it. My plan for this patient is to leave her some myopia with the IOLs. In the good, nonamblyopic eye, I'll leave her with 1.5 D. I think you can get pretty close on the astigmatism correction with femto, although it won't be perfect. For the right eye, we're at our max. She's going to be left with 2.0 D of cylinder. You can correct about a diopter of that. That might come in handy for near vision, but you could also go back and do LASIK in the right eye at a later time.

**Dr. Trattler:** I want to do surgery, but we're frustrated here in the United States; we don't have all the options for toric range of vision IOLs, as they correct only a limited amount of astigmatism. My first choice would be the PanOptix Toric or the TECNIS Synergy Toric.<sup>14</sup> However, because there is a high level of astigmatism OD, I would proceed with the monofocal toric lens with the goal of ending up myopic, and then perform photorefractive keratectomy (PRK) to reduce the residual astigmatism OD. In the left eye, I'd consider PanOptix Toric. I would place the 34 power model, so that the eye would end up with myopic astigmatism. The patient would then undergo PRK to treat the residual myopia and astigmatism.

**Q | Dr. Wörtz:** Dr. Gupta, what's the largest arc you would do on a patient like this? How high do you go with your arcs max?

**Dr. Gupta:** Fifty degrees with-the-rule astigmatism. I certainly could not argue with doing laser vision correction. The key here is to leave her myopic and then perform myopic LASIK.

She's in a tough situation no matter where we leave her. The question is what option gives her the least amount of surgery?

**Dr. Weinstock:** Patients with small eyes are at high risk for choroidal effusions or choroidal hemorrhages; they are not easy to operate on. This is definitely a short eye. Her Ks are pretty flat. The other thing that's interesting is her anterior chamber depth is relatively normal, as is her corneal thickness. I agree with Dr. Gupta about leaving a spherical equivalent of plano if you have residual myopia, because that's easier to treat

postoperatively. Furthermore, a younger person might enjoy that myopia, at least in one eye.

What's seldom remembered is the usage of piggyback IOLs, or two IOLs inside the eye. I used to do it with two torics, and I've done it with a toric and a monofocal. I would use PanOptix and Light Adjustable Lens (LAL),<sup>15</sup> both in the bag, to give her full range of vision at her age. Once she receives IOLs and some normal anatomical optics, she might resolve to 20/20 VA. What's nice about the LAL is you can clean up everything postoperative with the adjustment, including the cylinder, because the LAL can treat up to 2.0 D of cylinder per treatment. If the LAL came in a strong enough lens, I might go with that alone.

**Q | Dr. Wörtz:** Do you worry about intraventricular membranes if you put the PanOptix and LAL in the bag or with disparate materials, do you worry less about it?

**Dr. Weinstock:** I've seen it very, very rarely. Silicone lenses are very easy to work with, and those membranes are removable tissues.

**Dr. Gupta:** Are you worried about the LAL activating light, reaching the other IOL, or causing any changes in the materials?

**Dr. Weinstock:** No, that's why I would put the LAL up front; you get a good refraction postoperatively. The LAL treatment is all about that refraction. You don't want to use the treatment until you have a good, stable refraction and you can refract them to nearly 20/20 or 20/12. Then you know you're set up for success with the late delivery.

**Dr. Gupta:** Is there any risk of regression of your treatment with the LAL?

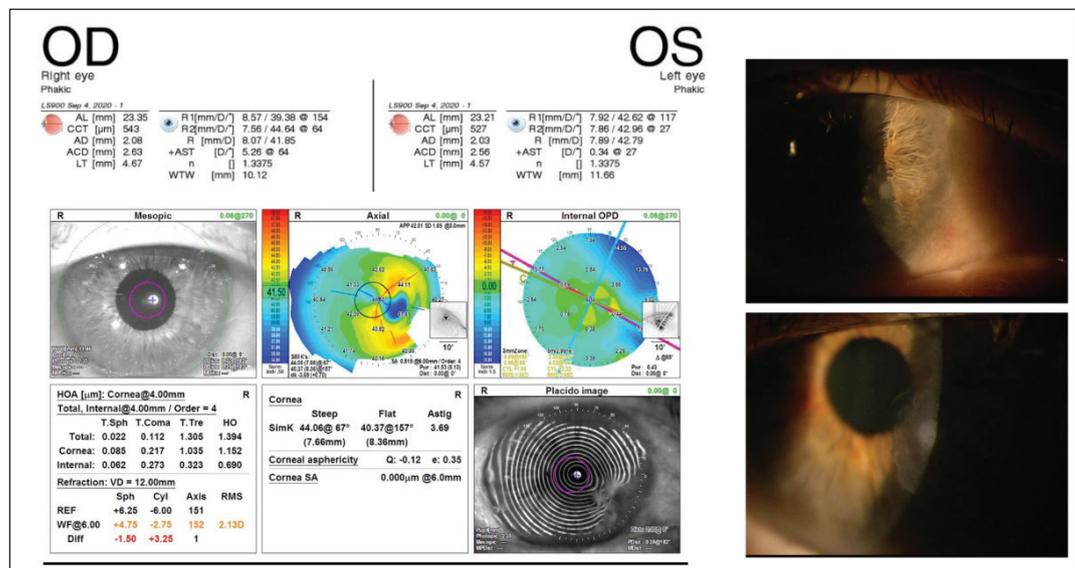


Figure 4. Baseline imaging.

**Dr. Weinstock:** I have not seen axial regression. I've seen micro changes of the eye as the wound heals over 6 months to a year.

**Dr. Wörtz:** Great insights and discussion. Let me recap what I did. This case was before the trifocals were available, so I used bilateral monofocal TECNIS torics, and I tried to go for plano. I did two 60° arcs. She did great, ending up 20/20 UCVA in the left eye and 20/40 UCVA in the right eye. She wears reading glasses for her near vision, but she's absolutely thrilled.

### ROUND 1 | CASE 4: THE IRREGULAR CORNEA

**Dr. Wörtz:** This case is a 73-year-old man who is a family friend and physician. He has well-controlled, type 2 diabetes and no retinopathy. He had a pterygium resection in his right eye 20 years ago. He complains of irritation and blurry vision in both eyes and is constantly switching between three pairs of glasses. He also has intermittent diplopia headaches. Manifest refraction shows +6.00 -5.25 x 150 OD and +2.75 -0.50 x 127 OS. Figure 4 shows his baseline imaging. There's a Salzmann's nodule and a significant amount of astigmatism.

I decided to remove the Salzmann's nodule and, afterward, he has almost no astigmatism, going down to less than .25 D. His OPD and RMS values are good, and he doesn't have a lot of higher order aberrations (Figure 5). We have a hyperope who has almost no astigmatism in either eye and wants full range of vision correction.

**Q | Dr. Wörtz:** What is the plan?

**Dr. Trattler:** Does this patient have to drive frequently at night?

**Dr. Wörtz:** They do some nighttime driving, yes.

**Dr. Weinstock:** What kind of a physician is this?

**Dr. Wörtz:** Double boarded in internal medicine and neurology.

**Dr. Weinstock:** This patient drives at night and is in a field of medicine that likely requires a lot of computer work within the electronic health record (EHR). They also have type 2 diabetes and, although there's no diabetic retinopathy currently, that's a risk down the road. Even though the cornea looks pretty good on topography (Figure 5), there has to be a little bit of a scar and irregularity from the pterygium and Salzmann's nodule resection. I'd steer the patient toward the Vivity lens because it's not as finicky as a multifocal; it's more forgiving. It's also going to be pretty functional for the patient as well because as long as you set the expectations that he's going to need a light pair of readers, it's a safe, long-term choice.

**Dr. Trattler:** I'd have an in-depth conversation with the patient about night driving and how important it is to him. How bothered would he be with some glare? If he really wants a better range of vision, I'd offer the Synergy. It will give him nice vision for distance and the EHR system at the computer. If he feel comfortable with the small potential risk of some glare at night, then I would go that direction.

**Dr. Gupta:** I'd use the Vivity or PanOptix bilaterally<sup>10</sup> and, at most, with Vivity a small amount of micro monovision.

**Dr. Wörtz:** I actually did bilateral PanOptix in both eyes, and the patient was extremely happy with 20/25 vision OD, the eye with the Salzmann's nodule, and 20/20 J1 OS. He was extremely happy.

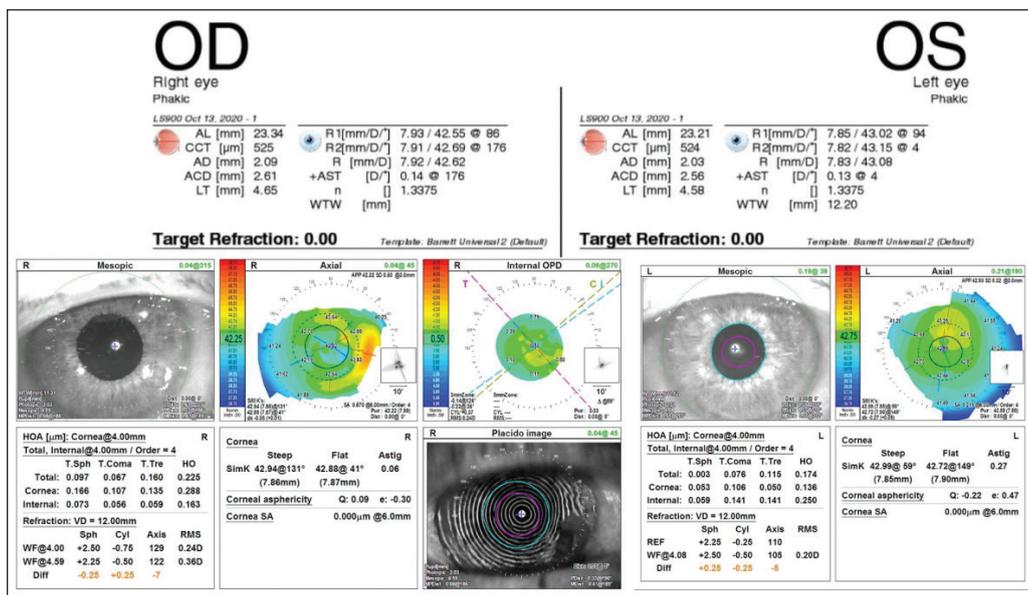


Figure 5. Imaging post-Salzmann's nodule resection.

### ROUND 2 | CASE 1: UNILATERAL TRAUMATIC CATARACT

**Dr. Wörtz:** Our next case is a 38-year-old, Indian-American man with a history of penetrating trauma in the right eye at age 4. To discuss this case, we are joined by William F. Wiley, MD, and Ashley Brissette, MD, MSc, FRCSC.

The patient has lived his whole life experiencing what he considers dramatic loss of vision in the right eye. We're not thinking about amblyopia in this patient, as he said that he recovered from that, but he does have an interesting history of penetrating trauma. He is myopic in both eyes with relatively low levels of astigmatism

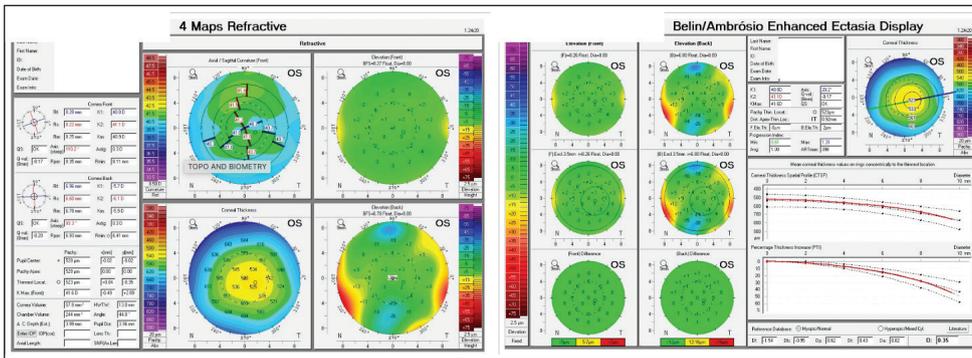
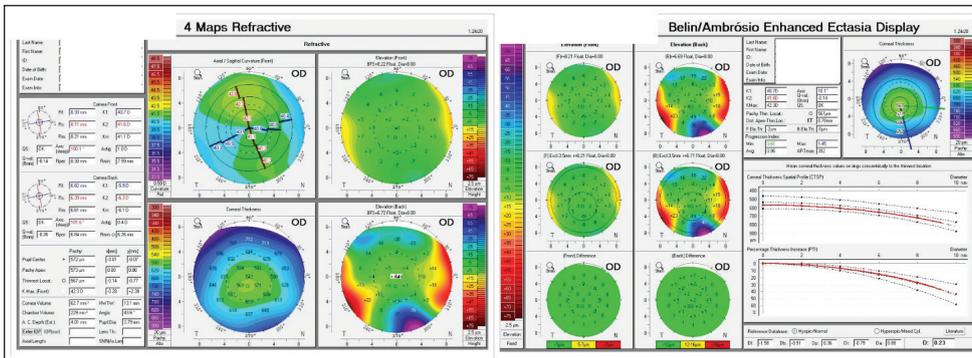
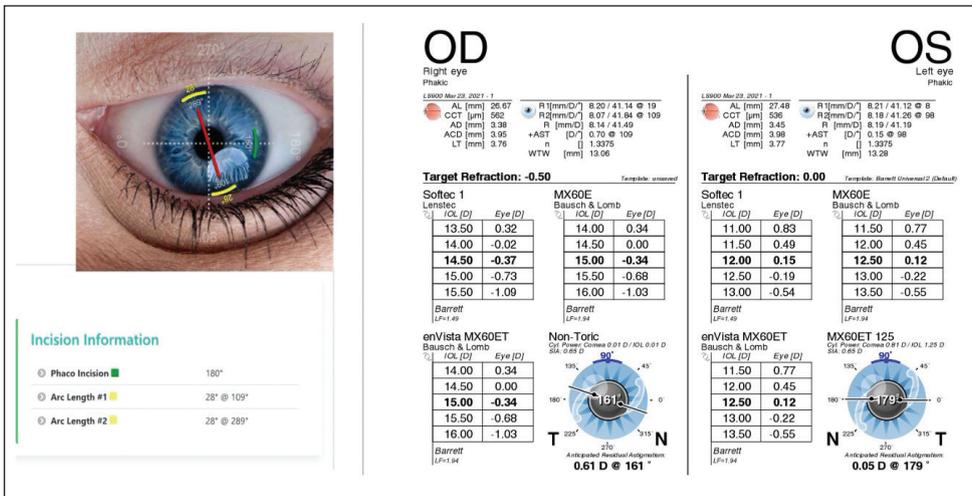


Figure 6. Baseline typography and biometry.

(OD: -2.25, -1.25, and 33 [BCVA: 20/50]; OS: 4.50, -0.50, and 99 [BCVA: 20/20-2]). His left eye looks like an average myopic eye for a 38-year-old. He's not presbyopic in that eye and is wearing glasses for vision correction. Figure 6 shows his typography and biometry. You can see a little bit of a longer axial length given his myopia than you might expect, relatively flat Ks in the 41 range, and a little bit of astigmatism.

If you look at the Oculus Pentacam, we're seeing some astigmatism that is slightly oblique and slightly more with the rule. His enhanced ectasia display is not showing any signs of ectasia that we'd worry about in the right eye, although that eye has some nuclear sclerosis. His left eye doesn't show us any signs that he'd have an issue with refractive surgery. To summarize,

the patient has a cataract in one eye, potential for history of penetrating trauma, and is myopic in the other eye, but not yet presbyopic.

**Q | Dr. Wörtz:** Dr. Brissette, I'll start with you. What are your observations?

**Dr. Brissette:** It's important to ask the patient what his vision goals are for surgery. His answer will direct how I present options about what's available and what can be achieved with the surgery.

**Dr. Wiley:** I also think it's important to understand his visual goals not only for the cataract eye, but also his other eye. Is his main complaint only blurred vision in the right eye, or is he also motivated to solve not only the cataract and but get out of glasses in both eyes? You need to look at the big picture, because whatever you do with the right eye is ultimately going to affect what you might have to do for the left eye. The patient may or may not be interested in operating on the left eye. Their answers will guide a different set of treatment parameters.

**Dr. Wörtz:** He's a computer programmer and spends a lot of time on his computer. He wears glasses all the time, and they are single focus. He does not wear contacts. He's of the mindset that if he's getting his right eye fixed, he's intrigued by the option of getting his left eye fixed as well. He is appreciating the cataract and noticing the vision loss.

He'd also like to be free of glasses for all tasks, but he doesn't appreciate presbyopia at this point.

**Dr. Weinstock:** If he's trending toward wanting to do something to his left eye, you'll need a commitment from him that he wants to undergo LASIK, SMILE, or a refractive procedure on his good, prepresbyopic eye. He's at the age where he still has some good accommodation ahead of him for 4 to 6 years. As good as the IOLs are, he will be well served by doing a less invasive corneal refractive procedure on that left eye. If we can get buy-in for that, then that opens the door to IOL selection and targeting the fellow eye. Now, you must remember he's had trauma, therefore expectations have to be set because we don't know what we're going to get into until we get there. We

Refractive Worksheet			Ectasia Checklist	
	OD	OS		No
Keratometry		40.8 @ 20.2 /41.1 @ 110.2	Age < 30	✓
Vario Performed	Done	Done	Increase in astigmatism error	✓
Scotopic pupil		6.85	Eye allergies / Rubbing	✓
Optical Zone		7.0	Inferior Steepening	✓
Pachymetry		523	Pellucid marginal degeneration	✓
Pentacam D Value		0.35	Borderline Pattern	✓
Flap Thickness		110	Final D >/= 1.65	✓
Residual Stromal Bed		320	Steep Keratometry > 46.00	✓
Manifest Refraction (MRX)		-4.75 -0.75 X 90	Flat Keratometry < 40.00	✓
IBRA Refraction		-4.76 -0.50 X 90	Post-Op K < 32.00	✓
			Posterior Float (pentacam) > 20 microns	✓
			Pachymetry < 500 microns	✓
			Residual Stromal Bed (RSB) < 300 microns	✓
			Percentage Tissue Altered (PTA) > 40	✓

Figure 7. LASIK workup.

may have to go with a simple monofocal for distance. He needs to understand that he may not get a full range of vision in that right eye.

**Dr. Wörtz:** Figure 7 shows the result of the standard LASIK workup. He’s a candidate for any laser refractive surgery.

On the slit lamp exam, there’s no frank phacodonesis or any sign that the lens is wobbling. There’s no iridodonesis. You can see a focal area where there may have been some trauma.

**Q | Dr. Wörtz:** Dr. Brissette, what is your initial plan for this patient, and what is your backup plan, if necessary?

**Dr. Brissette:** If you can achieve good centration and safely remove the cataract, a nondiffractive EDOF in that eye will give him crisp distance and intermediate vision,<sup>6</sup> which will be important for his job and his hobbies. You can also achieve pretty good near vision with the EDOF as well. For his second eye, you can do LASIK or SMILE. You could even use an implantable collamer lens (ICL) in that left eye, given how myopic he is.<sup>16</sup> If things didn’t go well with the first eye—you couldn’t get good centration or it was a complicated surgery—then I’d revisit our options with him. If I had to sew a lens into this eye and the vision quality wasn’t good, I would make sure that I remove his cataract first before doing any kind of LASIK or any procedure on his second eye so we know exactly what the refractive outcome is. We’d then address the left eye from there.

**Dr. Wiley:** A non-diffractive EDOF is a great choice for that right eye to give him some depth of focus. I also agree that, because he’s not presbyopic, he’s not going to appreciate the full benefits of diffractive IOL, particularly when he’s comparing that to his accommodating natural lens on the other eye. Steering clear of a diffractive IOL is smart. This may be the perfect situation for an LAL in the right eye. If you do that, target more plano, and then don’t adjust it yet—assuming everything goes well and you’re close to a reasonable tar-

get—you then work on the left eye. The LAL can be adjusted after the patient has achieved their refractive surgery target in the left eye, and thus the patient could have an opportunity to fine-tune a desired target in the LAL eye to complement the refractive surgery in the other eye. I think an ICL is a great choice for the left eye because this patient will understand what his vision is like with pseudophakia and appreciate the high quality of vision that a one-focus IOL provides. An ICL likely gives a slightly better quality of vision than corneal refractive surgery and thus would pair better with pseudophakia, which is present in the other eye.

With a corneal refractive surgery in one eye and IOL in the other, the patient may notice some difference in visual quality. Let’s say you put an ICL in his left eye, and you have the unadjusted LAL in the right eye. You can then check in to see how the patient is doing and adjust the right eye from there. You can offer some contact lens trials to show him what that might look like to really make sure you maximize the right eye focal point. You have that ability to show him what that’s going to be like before you lock it in.

**Dr. Weinstock:** I think both of these solutions could work. My plan A is a toric EDOF or some arcs with a laser with iris registration. It’s not going to function for the first 4 or 5 years as well as the other eye that has LASiE, but eventually that EDOF lens will probably outperform the other eye as he becomes presbyopic, at least for computer use.

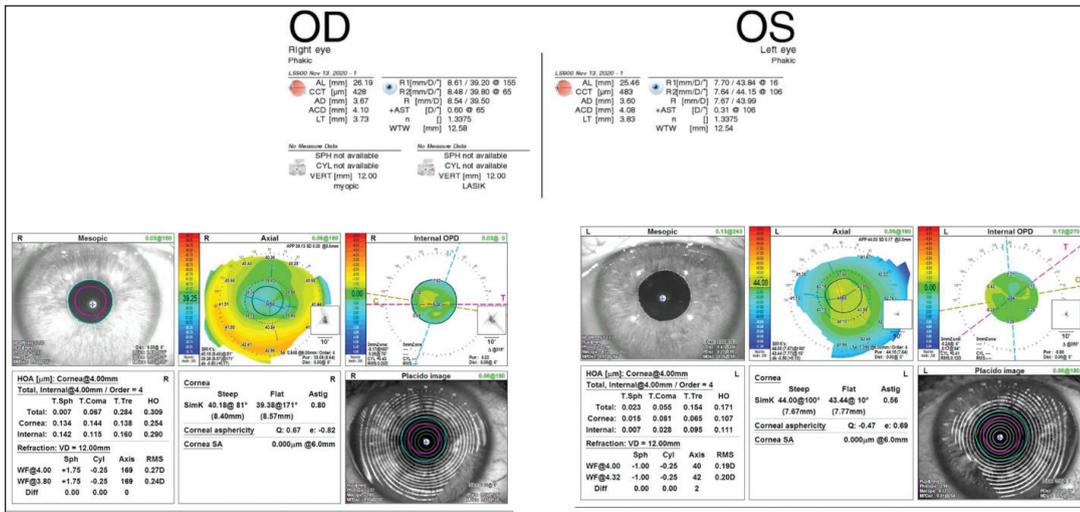


Figure 8. Baseline biometry.

However, the EDOF lens has the potential complication of not centering well. There could be damage to the capsule. You could get in there and realize it's not safe to use an EDOF or multifocal. The LAL is a great second choice because it's a bit more functional with milder decentration than an EDOF lens. Another factor is that if you do that and you set him for distance with a monofocal or an LAL because you can't put in the EDOF, you now have his other eye that is a -4 and potentially going to get LASIK. That eye will be able to accommodate, but the other eye will not. As he becomes presbyopic, he's going to end up taking his glasses off at the computer.

It may be logical to discuss this with him, and ask what result he'd rather have if we can't use the EDOF lens. Would he rather me target this as a near-vision eye so he keeps wearing distance glasses as a backup plan, or does he want me to set it for distance and then do LASIK or an ICL on the other eye? It's important to ask him so you're on the same page in case something doesn't go well and you need a backup plan.

**Dr. Wörtz:** I'll tell you what I did. I decided to go with the EDOF, Vivity lens. We did have some zonular compromise at 4 o'clock, so I put in a CTR. The lens centered very nicely. His OD VA was 20/20 distance, 20/25 intermediate, and J5 at near. I did LASIK in the other eye, and it did beautifully at 20/20 J1+ with no complaints of glare or halos. He's very happy.

## ROUND 2 | CASE 3: THE COLLEAGUE

**Dr. Wörtz:** Our next case is a friend of mine who is a referring optometrist. He is a 63-year-old man with normal progressive blurry vision with glare in both eyes. His right eye is worse than left. In the past, he was a moderate myope, about a -2 in both eyes. He had LASIK in his right eye only around age 40 as he was starting to appreciate his presbyopia and decided to do monovision, which he had success with. He now wants his full range of vision correction without glasses or contact lenses, if possible. Figure 8 shows his biometry.

You can see on the topography where he had LASIK that there's a flattened central area in that right eye. His RMS values are not too bad in either eye, but maybe a bit better in the left eye. Both eyes look pretty good. He has a small amount of astigmatism in both eyes, which we have some opportunities to correct.

**Q | Dr. Wörtz:** How would you proceed?

**Dr. Wiley:** Thankfully, eye doctors tend to make good patients for these types of decisions; they understand the nuances. I'd like to know what kind of LASIK he had. Was it modern-day LASIK within the last 5 to 10 years, or was he an early adopter?

**Dr. Wörtz:** This is LASIK 1.0.

**Dr. Wiley:** Sometimes the LASIK optical zones are a little smaller on those patients, and the glare and halo risk is a higher. I'm more hesitant doing a multifocal in patients who had LASIK years ago. Eyes that underwent modern-day LASIK are more similar to virgin eyes as far as the optics. Older-generation LASIK patients are more challenging. I'd also like to know what type of contact lenses the patient was using and if there was anything of note in the left eye. Is the left eye normal? Are we operating on both eyes or just the right eye?

**Dr. Wörtz:** He does have cataracts that he appreciates in both eyes. He is ready for lens-based surgery in both eyes. I don't think I dove into what brand of multifocal contact lens he used, but I think it was a standard multifocal.

**Dr. Brissette:** I'd be hesitant to use a trifocal, but I think a nondiffractive EDOF would be great for this patient, especially because he has more near vision in his left eye. He'll have great distance vision and some intermediate vision, and his left eye will have near vision. He gets a bit of everything. I think the safest thing to do with the 1.0 LASIK is a nondiffractive EDOF.

**Dr. Weinstock:** You've got to listen to this patient and what his goals are. As an optometrist, he is well aware of the postoperative problems and the pros and cons. He will be refracting himself every day, and that's a big consideration. This is the perfect case for an LAL, especially on that right eye, because of the LASIK. We want to nail the distance target.

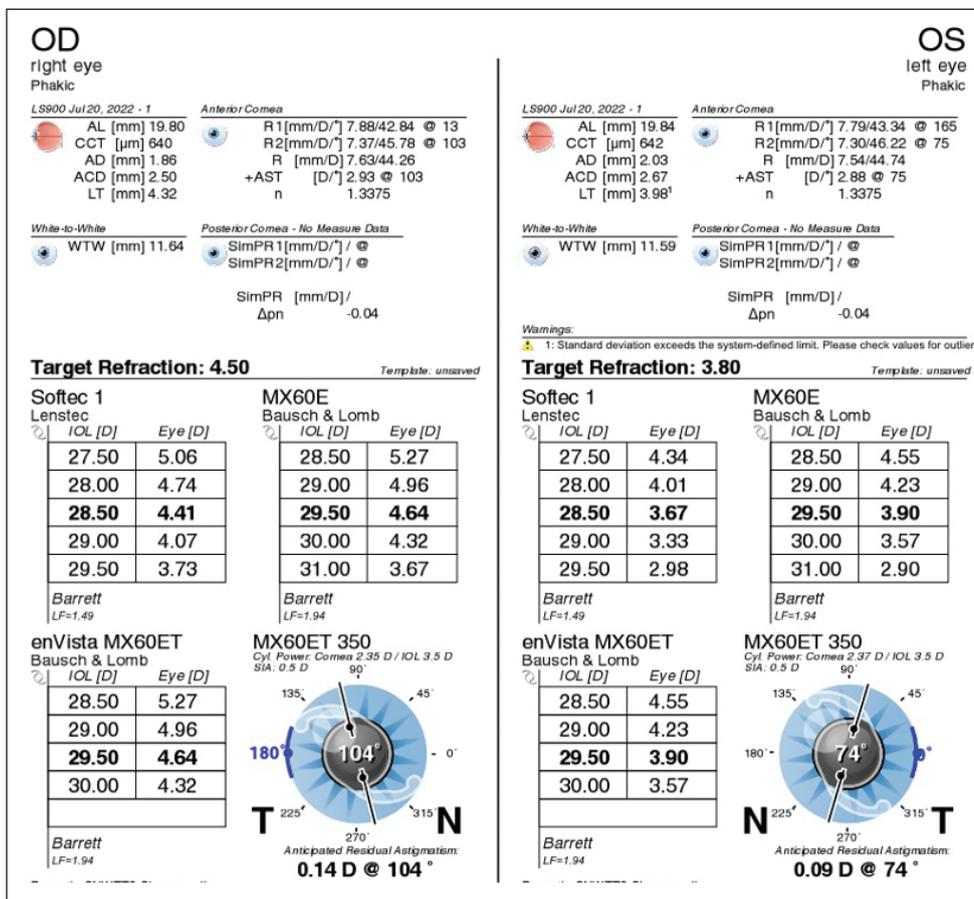


Figure 9. IOL calculations.

**Dr. Wiley:** There's the new IC-8 lens, Aphera, that was recently approved and will be in our hands shortly. It's a small-aperture optic.<sup>17</sup> That could be used. The topography on the right eye shows a little bit of irregularity that's close to the center. I'd ask the patient if he had aberrations or concerns with his quality of vision after LASIK. If he's always noticed some loss of quality or contrast, he may benefit from the Aphera. Not only can it get him distance vision, but it also has EDOF for near vision and will block out some of the aberrations that were induced from the LASIK. It's slightly more tolerant to a refractive miss and residual astigmatism. You could also offer a trial of the new pilocarpine eye drop and see how he tolerates aperture vision.<sup>18</sup> If he likes the vision with the drop, you can lean toward the Aphera.

I also think LAL is a great option, as it gives you the ability to fine-tune that landing. Going from distance to near, you still have that other eye, which could work well with a multifocal. I've had success with the PanOptix in one eye and an LAL in the other. You could demonstrate it with contact lenses, and see if the patient likes it. There are a lot of options, but I think the best choice is an LAL in the right eye and the PanOptix in the left.

**Dr. Brissette:** I will stick with my original answer, which is a nondiffractive EDOF in the right eye to provide him with a nice

range of vision. In his left eye, because he's nearsighted, I'd wait and see how the first eye heals. If he has excellent distance and intermediate vision, and his left eye's giving him excellent near vision, then I would match his left eye for near there.

**Dr. Weinstock:** I would undeniably recommend LAL bilaterally, starting with a monovision and adjusting from there. Even though his LASIK was 20 years ago, I bet it turned out perfectly and he probably had excellent distance vision in that eye. He became presbyopic in that eye, and he was used to still having good distance vision. I want to nail one eye for distance, especially in an eye doctor. I'm not going to take any chances with weird optics. There's a wild card with an EDOF or a multifocal in that eye and there's a targeting issue. My gut tells me to go with LAL; he's used to monovision.

**Dr. Wörtz:** I'll tell you what I did. I mixed and matched IOLs. I used 20.5 D Vivity + 24° arcs at 64 and 245 OD and 15.0 D PanOptix + 15° arcs at 106 and

286 OS. He's done fantastically. He's 20/20, 20/20, and J1 OD and 20/20, 20/15, and J1+ OS. Interestingly, he tells me that he actually prefers the quality of vision in his PanOptix eye as opposed to the Vivity eye. He's very happy.

### ROUND 3 | CASE 3: THE HYPEROPE WITH ASTIGMATISM

**Dr. Wörtz:** For this case, we are joined by James C. Loden, MD, and Neda Shamie, MD. This case discusses something that we do in our clinic in central Kentucky that may be a little different from you all. We do evaluations and same-day surgery for patients who are coming in from rural areas of Kentucky, more than a couple hours away. This case is a 66-year-old woman who presented for same-day surgery evaluation. She wants the best distance vision possible. Her MRx is +8.25, -3.50 x 11 OD and +8.75, -1.00, and 160 OS. She drove 3 hours to have an evaluation and surgery today. She is a super high hyperope with poor vision quality. Figure 9 shows her IOL calculations.

The lens consignment in stock only goes up to 30 D in enVista Toric IOL. If we implant an enVista Toric, we're going to leave this patient essentially +350, +450 in both eyes.<sup>19</sup> That will not make her happy. For the sake of argument, you have to come up with a plan for surgery on one of the eyes today.



**Dr. Loden:** What power gets you to plano? It looks like we're going to have to get up to almost a 37 D or a 40 D lens to get to plano. Is that right?

**Dr. Wörtz:** That's right.

**Dr. Loden:** The highest I've seen is around 40 D on a special-order monofocal lens and that's not a toric. Do I want to put in a toric and then do a piggyback on top of it aiming for myopia? Because I'd rather leave her with compound myopic astigmatism than hyperopic astigmatism. That way I can come back and do a bioptics with PRK. Your other option is to see where a 40 D lens will get you. But you'll still have to shoot for a -2 to leave yourself with compound myopic astigmatism to do an easy LASIK or PRK touch up. When there's doubt, I try to leave everyone with compound myopic because you'll likely be able to hit the target with one touch up with a modern laser.

Unless I can get the patient to compound myopic astigmatism with one lens, I would use a toric with a piggyback. I would err to the side of a little bit of compound myopic astigmatism just in case I missed. I would use my Holladay consultant to help me with my piggyback IOL calculation on this. That way I could put in a toric and wouldn't have to correct as much astigmatism potentially with the final PRK or LASIK touch up.

**Neda Shamie, MD:** I think this comes down to the fact that this patient has walked around with really terrible vision for most of her life, with a lot of dependency on glasses and correction. If we can debulk this refractive error to a much more acceptable level and ensure she is fitted with glasses that sit comfortably on her face, then she would likely be happy. But we always approach surgery in a way of targeting the final outcome, being as close to plano or whatever the refractive target the patient wishes to have. I agree with Dr. Loden that no matter what we do, we're going to be left with a refractive outcome that would've been better if we had done piggyback. I would go with the highest power toric available to debulk that astigmatism as much as possible. I would leave her with a refractive outcome that I could potentially address with a piggyback.

**Q | Dr. Wörtz:** Would you do a piggyback secondarily, or would you do a primary piggyback?

**Dr. Shamie:** I would do it secondarily only because there is a high likelihood the patient would be happy with the vision she will achieve even without the piggyback. Of course, if she is highly motivated to reach plano outcome, I would consider primary piggyback.

**Dr. Wörtz:** Dr. Loden, are you voting for a primary monofocal piggyback for this?

**Dr. Loden:** Yes, a monofocal toric with a piggyback and erring on the side of overcorrecting slightly toward myopia. I

don't want to return to the OR. You're charging the patient an upcharge with the toric lens, and she's not going to be happy if you make her go back to the OR and pay more fees. For the secondary procedure, I can absorb the cost of the PRK.

**Dr. Weinstock:** A really nice thing to do with this case is to do a femtosecond laser so that you can image the cataract and see how big it is. If the capsule is big, that bodes well for piggyback. Now the anterior chamber depth in this patient is only 2.5 mm, so it's a small eye. If you have too small of an eye and you put in a piggyback IOL, you can get iris chafing and pigmentary dispersion glaucoma, and end up with a whole bunch of problems. My best experience with piggybacks has been both lenses in the bag, protecting the iris and the rest of the anterior segment from the haptics and the optic materials. I'd put a relatively small capsulotomy, maybe 5 mm, so you get optic capture and you keep both those lenses tucked in.

I would do piggybacks as long as the anatomy provided for it. I would put the highest power toric you can find in the bag on axis, and maybe use the LENSAR and iris registration. I'd knock out all the cylinder, and then fill in the rest easily with an IOL formula. I'd probably use the SoftPort LI61AO, which is a silicone lens. I like having two different optic materials. You could use a hydrophobic acrylic toric like the enVista or the Akreos, then you could have a silicone lens sitting on top of that, which is a very thin, clear optic. It doesn't take up a lot of room, and it is easily exchangeable if there's a problem. I would not do both eyes on the same day. I'd make sure they were doing well with their first eye and then, if so, proceed with the second eye the same way.

**Q | Dr. Wörtz:** Now, I don't have an LAL, but just as a discussion point, would anyone consider splitting the power and putting in a 10 D LAL?

**Dr. Weinstock:** The problem is this patient has traveled a great distance and that approach would require many follow-up visits. There hasn't been a lot of experience with people doing piggyback LALs and treating the lens with that. We need a solution, so we don't have to do surgery on the cornea. I think all of us really dread having to do either LASIK or PRK after lens implant surgery. It's just not ideal for the patient and for the whole healing process. PRK is not fun. LASIK produces dry eye. We want to nail it with lenses.

**Dr. Shamie:** And in this case, it's going to be a hyperopic correction. So, it's not always ideal. The largest the LAL is available is up to 30. That's an interesting idea because you can treat the astigmatism, but then you'll be left with 3 D of hyperopia.

**Dr. Weinstock:** If that was the case, you'd want to put the nonadjustable lens in the back of the bag and put the adjustable lens on top of it. The UV would hit that lens directly first.

**Dr. Loden:** Most hydrophobic acrylic lenses have UV protection in them, right? So, you don't want to put the LAL in the bag and then another lens on top of it. I think it would affect your ability to adjust the lens and lock it in.

**Q | Dr. Wörtz:** Obviously, this is off label, but combining technology in situations like this is interesting. For the sake of argument, does anyone want to take the LAL as the top piggyback?

**Dr. Shamie:** I'll take it. You convinced me.

**Dr. Wörtz:** To summarize the approaches, Dr. Shamie is going to do a toric in the back and to split the power with an LAL as a piggyback. Dr. Loden is going to leave compound myopic astigmatism with a primary piggyback. And Dr. Weinstock is going to put two lenses in the bag.

I did what Dr. Loden suggested. I decided that I would use the highest power toric that I had. I then multiplied the residual refraction by 1.5. OD was 30.0 D, 3.50 Cyl + 6.5 D with an LI61AO (MRx: -0.75, -1.50 x 122). OS was 30.0 D, 3.50 Cyl + 5.0 D with an LI61AO (MRx: -0.25, -0.75 x 122). They ended up with compound myopic astigmatism, and we're considering LASIK or PRK enhancement.

**Dr. Shamie:** This is an amazing result.

**Dr. Wörtz:** The patient is super happy with 20/30, 20/40 VA, considering where she started.

That concludes our cases and discussion of adjunctive technologies for cataract and refractive surgery to manage complex cases. Thank you for participating. It's been so much fun discussing these cases with you all. ■

1. Sioufi K, Zheleznyak L, MacRae S, Rocha KM. Femtosecond lasers in cornea & refractive surgery. *Exp Eye Res.* 2021;205:108477.
2. de Medeiros AL, de Araujo Rolim AG, Motta AFP, et al. Comparison of visual outcomes after bilateral implantation of a diffractive trifocal intraocular lens and blended implantation of an extended depth of focus intraocular lens with a diffractive bifocal intraocular lens. *Clin Ophthalmol.* 2017;11:1911-1916.
3. Zvorničanin J, Zvorničanin E. Premium intraocular lenses: The past, present and future. *J Curr Ophthalmol.* 2018;30(4):287-296.
4. Montagué-Martínez D, Ferrando V, Martínez-Espert A, García-Delpech S, Monsoriu JA, Furlan WD. In vitro chromatic performance of three presbyopia-correcting intraocular lenses with different optical designs. *J Clin Med.* 2022;11(5):1212.
5. Öztürkmen C, Kesim C, Karadeniz PG, Sahin A. Visual acuity, defocus curve and patient satisfaction of a new hybrid EDOF-multifocal diffractive intraocular lens. *Eur J Ophthalmol.* 2022;32(5):2988-2993.
6. Dołowiec-Kwapisz A, Piotrowska H, Misiuk-Hojfo M. Evaluation of visual and patient-reported outcomes, spectacle dependence after bilateral implantation with a non-diffractive extended depth of focus intraocular lens compared to other intraocular lenses. *J Clin Med.* 2022;11(17):5246.
7. Montés-Micó R. Evaluation of 6 biometers based on different optical technologies. *J Cataract Refract Surg.* 2022;48(1):16-25.
8. Kane JX, Connell B. A comparison of the accuracy of 6 modern toric intraocular lens formulas. *Ophthalmology.* 2020;127(11):1472-1486.
9. Pantanelli SM, Sun A, Kansara N, Smits G. Comparison of Barrett and emmetropia verifying optical toric calculators. *Clin Ophthalmol.* 2022;16:177-182.
10. Hovanesian JA, Jones M, Allen Q. The Vivity Extended Range of Vision IOL vs the PanOptix Trifocal, ReStor 2.5 Active Focus and ReStor 3.0 Multifocal Lenses: A comparison of patient satisfaction, visual disturbances, and spectacle independence. *Clin Ophthalmol.* 2022;16:145-152.
11. Galvis V, Escaf LC, Escaf LJ, et al. Visual and satisfaction results with implantation of the trifocal Panoptix® intraocular lens in cataract surgery. *J Optom.* 2022;15(3):219-227.
12. Ferreira TB, Ribeiro FJ, Silva D, Matos AC, Gaspar S, Almeida S. Comparison of refractive and visual outcomes of 3 presbyopia-correcting intraocular lenses. *J Cataract Refract Surg.* 2022;48(3):280-287.
13. Fernández J, Alfonso Sánchez JF, Nieradzki M, Valcárcel B, Burguera N, Kapp A. Visual performance, safety and patient satisfaction after bilateral implantation of a trifocal intraocular lens in presbyopic patients without cataract. *BMC Ophthalmol.* 2022;22(1):341.
14. Gabrić N, Gabrić I, Gabrić K, Bišević A, Pihero DP, Bohač M. Clinical outcomes with a new continuous range of vision presbyopia-correcting intraocular lens. *J Refract Surg.* 2021;37(4):256-262.
15. Moshirfar M, Martin DJ, Jensen JL, Payne CJ. Light adjustable intraocular lenses: an updated platform for cataract surgery [published online ahead of print, 2022 Oct 17]. *Curr Opin Ophthalmol.* 2022;10.1097/ICU.0000000000000911.
16. Cao K, Zhang J, Wang J, et al. Implantable collamer lens versus small incision lenticule extraction for high myopia correction: A systematic review and meta-analysis. *BMC Ophthalmol.* 2021;21(1):450.
17. Sánchez-González JM, Sánchez-González MC, De-Hita-Cantalejo C, Ballesteros-Sánchez A. Small aperture ic-8 extended-depth-of-focus intraocular lens in cataract surgery: A systematic review. *J Clin Med.* 2022;11(16):4654.
18. Waring GO 4th, Price FW Jr, Wirta D, et al. Safety and efficacy of AGN-190584 in individuals with presbyopia: The GEMINI 1 Phase 3 randomized clinical trial. *JAMA Ophthalmol.* 2022;140(4):363-371.
19. Packer M, Williams JJ, Feinerman G, Hope RS. Prospective multicenter clinical trial to evaluate the safety and effectiveness of a new glistering-free one-piece acrylic toric intraocular lens. *Clin Ophthalmol.* 2018;12:1031-1039.

# KOL KNOCKOUT™ CATARACT EDITION: Heavy Hitters Discuss Using Next-Generation Technologies to Maximize Outcomes in Complex Cases

Release Date: December 2022  
Expiration Date: January 2024

## INSTRUCTIONS FOR CREDIT

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://evolvemed.com/course/2233-supp>. If you experience problems with the online test, email us at [info@evolvemed.com](mailto:info@evolvemed.com). *NOTE: Certificates are issued electronically.*

Please type or print clearly, or we will be unable to issue your certificate.

Full Name \_\_\_\_\_ DOB (MM/DD): \_\_\_\_\_

Phone (required) \_\_\_\_\_ Email (required\*) \_\_\_\_\_

Address/P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State/Country \_\_\_\_\_ Zip \_\_\_\_\_

License Number: \_\_\_\_\_ OE Tracker Number: \_\_\_\_\_ National Provider ID: \_\_\_\_\_

\*Evolve does not share email addresses with third parties.

## DEMOGRAPHIC INFORMATION

Profession

\_\_\_ 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

**Identify** the potential benefits and drawbacks of using femtosecond laser technology for cataract and refractive surgery

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Discuss** advances in adjunctive technologies for cataract surgery and how they can be used to improve refractive outcomes

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Compare** advanced intraocular lenses for cataract and refractive surgery patients to properly counsel patients and create personalized treatment plans based on patient expectations

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# POSTTEST QUESTIONS

Please complete at the conclusion of the program.

---

**1. Based on this activity, please rate your confidence in your ability to improve postoperative outcomes in cataract/refractive surgery (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. How many diopters of cylinder can be treated postoperative with a Light Adjustable Lens (LAL)?**

- A. Up to 0.5 D
- B. Up to 1.0 D
- C. Up to 1.5 D
- D. Up to 2.0 D

**3. A 38-year-old man with a traumatic cataract presents to your office for evaluation. He desires an intraocular lens implanted that gives him good distance and intermediate vision. Which of the following is the best choice?**

- A. Nondiffractive extended depth of focus lens
- B. Monofocal lens
- C. Monofocal toric lens
- D. 3-piece monofocal lens

**4. You are evaluating a 66-year-old woman with high hyperopia. Her Mrx is +8.25 -3.50 x 11 OD and +8.75 -1.00 x 160 OS. She wants the best distance vision possible, which would call for a lens of about 40 D. Which of the following statements about her management is TRUE?**

- A. 40 D toric lenses are readily available
- B. Using femtosecond laser to image the cataract can help assess if the capsule would allow for a piggyback lens
- C. A piggyback IOL is not a good option for this patient
- D. A piggyback IOL cannot be performed with a LAL in this patient

**5. What are patients with small eyes at particular risk for?**

- A. Choroidal effusions and choroidal hemorrhages
- B. Intraoperative floppy iris syndrome
- C. Posterior capsular rupture
- D. Retinal tears and breaks

**6. A 38-year-old man presents for evaluation of a traumatic cataract. What problem might you anticipate if using a premium lens?**

- A. Poor lens centration
- B. Higher risk of retinal tears/detachment
- C. Higher risk of endothelial compromise
- D. Higher risk of UGH syndrome

# 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

\_\_\_\_ Practice-Based Learning and Improvement

\_\_\_\_ Professionalism

\_\_\_\_ Medical Knowledge

\_\_\_\_ Interpersonal and Communication Skills

\_\_\_\_ 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 if you have made changes to your practice based on this activity? If so, please provide your email address below.

---

---



**CRST**  
Cataract & Refractive Surgery Today

**CRST** EUROPE  
Cataract & Refractive Surgery Today

**MILLENNIAL**EYE