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A Modern Guide to RLE: Expert Guideline Recommendations for the Modern Refractive Cataract Practice



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Distributed with





A Modern Guide to Refractive Lens Exchange: Expert Guideline Recommendations for the Modern Refractive Cataract Practice

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Content Source

This continuing medical education (CME) activity captures content from a series of interviews.

Activity Description

This supplement summarizes expert guideline recommendations for the modern refractive cataract practice.

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 definition, prevalence, etiology, and key characteristics of patients who are candidates for refractive lens exchange
- **Describe** how the latest presbyopia-correcting IOL technologies and pharmaceutical presbyopia treatments can create new groups of satisfied refractive lens exchange patients
- **Outline** strategies for finding, communicating with, and educating patients about refractive lens exchange clinical outcomes, costs, risks, and benefits, including quality-of-life and quality-of-vision considerations

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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 identify patients who are candidates for refractive lens exchange (RLE; 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. The enhanced monofocal intraocular lens (IOL) has the following characteristic:

- a. It has more of a plateau than typical multifocal IOLs
- b. It has a beam-shaping element, offering more intermediate vision
- c. It uses spherical aberration to slightly flatten the defocus curve, so it does not drop off rapidly from distance vision
- d. None of the above

3. _____ IOLs filter out unfocused peripheral rays of light while the central rays reach the retina.

- a. Trifocal
- b. Monofocal plus
- c. Light Adjustable Lens
- d. Small aperture

4. The hybrid extended depth of focus/multifocal IOL has the following characteristic(s):

- a. It can be fine-tuned multiple times after surgery
- b. It has a greater risk of halos and glare
- c. It is a good lens for patients who cannot tolerate halos and glare
- d. All of the above

5. What is one main factor that has driven the increase in RLE surgery?

- a. IOL advances
- b. Patients seek RLE instead of LASIK or PRK
- c. Surgeons achieve refractive results within 97% of the desired refractive outcome
- d. Decreases in IOL costs

6. Which statement is true?

- a. RLE results are permanent, with only minimal corneal changes that occur during subsequent decades
- b. LASIK results tend to be permanent, especially in patients with hyperopia
- c. RLE cannot correct high hyperopia
- d. LASIK is the best option for presbyopic patients who want to reduce their dependence on spectacles at all distances

7. Which of the following IOL(s) is/are associated more often with halos and glare that may be unacceptable for frequent night driving?

- a. Nondiffractive extended depth of focus IOLs
- b. Trifocal IOLs with diffractive optics
- c. Light Adjustable Lens
- d. A & C

8. Which patients are more likely to have higher expectations of RLE?

- a. Patients with cataracts that impair their vision
- b. Patients with early signs of glaucoma
- c. Patients who use contact lenses for monovision
- d. Younger patients without cataracts who see well with glasses or contact lenses

9. Small aperture IOLs can neutralize astigmatism as great as ____.

- a. 1.00 D
- b. 1.25 D
- c. 1.50 D
- d. 2.00 D

10. Which patient is more likely to be an RLE candidate?

- a. Someone with low myopia between the ages of 20 and 35
- b. Someone with early signs of retinal pathology
- c. Someone needing an enhancement after laser vision correction
- d. Someone with presbyopia and cataracts that do not yet require surgery who would like to reduce their dependence on spectacles

11. Patients with _____ were reported to be especially at risk of retinal detachments or tears after RLE.

- a. Astigmatism
- b. High myopia
- c. Presbyopia
- d. High hyperopia



The History and Future of RLE



New technology has made RLE increasingly valuable in refractive surgery practices.

BY ERIC D. DONNENFELD, MD

Refractive lens exchange (RLE) has emerged as an important part of our practice in correcting refractive errors. It has become an extraordinarily safe procedure, and today's refractive technologies enable us to deliver quality visual acuity to patients.¹⁻³ In many cases, we can correct distance and near vision in presbyopic patients with outcomes that we cannot achieve with other refractive modalities.

RLE BENEFITS

Historically, RLE was not a significant part of most practices because its accuracy and safety were not commensurate with the associated risks. Now we have such advanced techniques to remove lenses that this has become an extremely well-accepted procedure.¹⁻³

Intraocular lens (IOL) advances and the accuracy of patients' refractive results have driven the increase in RLE. We now can perform lens exchange surgery much more precisely and achieve patients' desired refractive results on a regular basis. Previously, when we did not have optical biometry, our accuracy in achieving refractive results within 0.50 D was 50 to 60%. Now, we are routinely able to achieve refractive results within 90% of the desired refractive outcome.⁴

Furthermore, RLE can correct astigmatism, and extended depth of focus and trifocal presbyopia-correcting IOLs help us routinely

"In many cases, we can correct distance and near vision in presbyopic patients with outcomes that we cannot achieve with other refractive modalities."

achieve excellent uncorrected distance, intermediate, and even near vision that we cannot achieve with corneal refractive surgery (Figures 1 and 2). The best we can deliver with corneal refractive surgery is monovision, which has limitations.

RLE achieves a permanent result, with only minimal corneal changes that will occur during subsequent decades. In contrast, LASIK results tend to be more transient, especially in patients with hyperopia. Older high myopes commonly develop cataracts at an earlier age. Phakic IOLs are indicated up to age 45. After that I commonly prefer RLE. In my experience, RLE is not associated with the small incidence of dry eye observed with LASIK in older patients.

During the last decade, I have performed fewer LASIK procedures on older patients, and RLE results are superior in my hands. I also believe RLE is safer for patients' long-term visual quality.

Images courtesy of Eric D. Donnenfeld, MD.

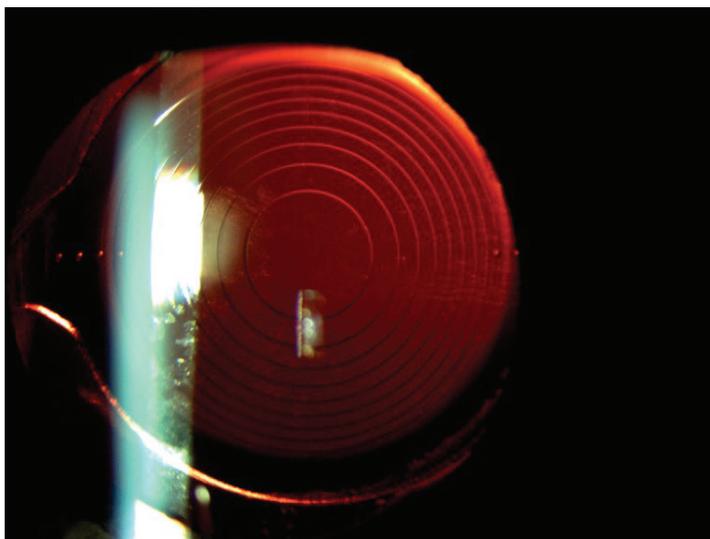


Figure 1. Toric extended depth of focus IOL for RLE in an astigmatic patient with high myopia.

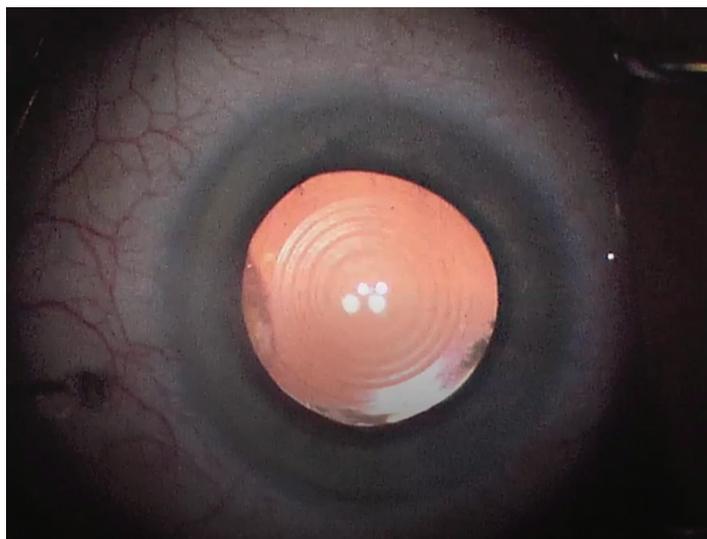


Figure 2. Trifocal IOL in a hyperopic patient having RLE.



Patients who are interested in RLE need to have reasonable visual demands that are achievable with today's technologies.

PRACTICE ADVANTAGES

RLE enables surgeons to provide continuity of care in delivering desired refractive outcomes. It fills a niche between treating younger patients with corneal refractive surgery and older patients having traditional cataract surgery.

RLE is very helpful in patients who had LASIK 10 to 20 years earlier who are experiencing decreased vision as they age. These patients are often in their late 40s to 60 and are motivated to achieve the best uncorrected vision possible. Before RLE became a significant part of my practice, the only procedure I could offer these patients was a PRK enhancement. This is not only uncomfortable, with prolonged healing, it was inaccurate in patients who had epithelial remodeling after LASIK a decade or two earlier.

CUSTOMIZED PATIENT CARE

Our top concern is providing the best and safest care for our patients. I believe RLE is the best option for many patients who want to reduce their dependence on spectacles. Therefore, I believe this procedure will be used more frequently. The greatest demand will be among patients who are interested in correcting their distance vision, as well as correcting presbyopia with technologically advanced IOLs.

"RLE enables surgeons to provide continuity of care in delivering desired refractive outcomes."

I also think it is safer for many patients to have a lens extraction procedure at an earlier age. Cataract extraction becomes more difficult as many patients age as lenses become harder and patients experience more physical disabilities.

Although patients may be hesitant to choose RLE because they bear the expense, surgery centers now can perform procedures more economically and patients sometimes have in-office procedures in certain practices, potentially reducing the cost of the procedure.

Refractive surgeons should consider growing RLE in their practices because it is good for patients. In addition, patient-shared billing is an economically viable part of our practice.

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4. Savini G, Taroni L, Hoffer KJ. Recent developments in intraocular lens power calculation methods-update 2020. *Ann Transl Med*. 2020;8(22):1553.



The RLE Patient



Careful patient selection is key to successful outcomes.

BY CATHLEEN M. MCCABE, MD

One of the exciting advances in cataract surgery is the ability to treat patients who have worn glasses their entire lives by implanting intraocular lenses (IOLs) that will improve their vision to a level of spectacle independence they may have never experienced (Figures 1 and 2). This has led to refractive lens exchange (RLE), where we can achieve similar results in patients who have not yet experienced decreased vision from cataracts.

To achieve the best visual outcomes from RLE, we need to know who can benefit most from the procedure.

IDENTIFYING CANDIDATES

Potential RLE candidates may have a friend or family member who achieved greater spectacle independence with cataract surgery, so they look for options to reduce their own use of contact lenses and glasses.

Sometimes they believe they are LASIK candidates and do not realize they may be better candidates for RLE. Although LASIK is a wonderful tool for patients who are not yet presbyopic, patients with high levels of hyperopia, myopia, or astigmatism are not good candidates for LASIK. Moreover, if patients are presbyopic, we can only use LASIK monovision to correct presbyopia, which has limitations. The eye will continue to age, the patient will increasingly need reading glasses, and cataracts eventually will develop.

In my practice, RLE candidates are usually presbyopic and desire spectacle independence.

RISKS VERSUS BENEFITS

The first step in assessing candidates is to perform a comprehensive examination and take a thorough history to ensure patients have healthy eyes that most likely will be healthy in the future. We look for early signs of macular or retinal pathology or glaucoma that would be incompatible with the technology we are considering. We also ensure that the cornea is healthy, examining the corneal endothelium to rule out early signs of Fuchs corneal dystrophy. In addition, we search for indications of posterior vitreous detachment, in particular in a patient with

"Presbyopic patients need to accept that anything that improves their range of vision is a compromise."



Figure 1. Cataract extraction surgery.



Figure 2. Patient's eye is marked for surgery.

high myopia, to determine the risk of a retinal tear or detachment during or after intraocular surgery.

We assess the patient's risk-benefit ratio and discuss it with the patient. RLE is an elective procedure, so we need to weigh the benefit of performing the procedure in a healthy eye versus the risk of a postoperative retinal tear or detachment, infection, or bleeding.

Images courtesy of Cathleen M. McCabe, MD.



"We are moving ever closer to a time when we will see a fairly high percentage of presbyopic patients choosing RLE before they have a visually significant cataract."

We also ask patients about their expectations from surgery. They need to understand that although advanced lens technologies provide greater spectacle independence, they will not achieve the vision they had in their teens or twenties. If they expect to be completely free of glasses for the rest of their lives, with no glare, halos, or dysphotopsia, they probably are not good RLE candidates. Presbyopic patients need to accept that anything that improves their range of vision is a compromise. They also need to know that a postoperative enhancement may be necessary to fine-tune their visual outcomes.

We also weigh the risk-benefit ratio of different lens technologies. Multifocal and trifocal IOLs can provide excellent distance and near vision. However, the risk of halos and glare associated with diffractive optics or diffractive extended depth of focus (EDOF) IOLs may be unacceptable in patients who engage in evening activities or drive frequently at night. Conversely, wavefront-shaping EDOF IOLs or monofocal plus lenses implanted with mini-monovision or light adjustable lenses with monovision increase spectacle independence at distance and intermediate, but patients occasionally may need reading glasses. However, the risk of glare and halos is minimized.

Even if we think a patient is a good candidate for RLE, some patients may not be interested because of the financial component.

In addition, some surgeons may not offer RLE because they are not confident they can meet patients' expectations regarding outcomes. Patients without cataracts who see well with glasses or contact lenses tend to have higher expectations of their postoperative vision compared with patients in whom cataracts have already impaired their vision.

SURGEON SURVEY

Refractive surgeons also are interested in having this procedure, based on the benefits they have observed in their patients.

In a prospective randomized survey of 500 refractive surgeons with 204 initial results, 89% of respondents perform RLE.¹ Even if they did not have cataracts, 23% of respondents would have lens exchange to correct presbyopia. Eleven percent of those surveyed had already had a lens procedure for presbyopia.

Nearly one-third of respondents advised family members to have RLE, and 19% had family members who had already had the procedure.

CONCLUSION

We are moving ever closer to a time when we will see a fairly high percentage of presbyopic patients choosing RLE before they have a visually significant cataract.

This shift is occurring because of advances in our technology. Postoperative quality of vision and visual function at an improved range of vision are very high, and they are meeting patient expectations. Patients are regaining their visual function and active lifestyle.

We also have access to topical presbyopia medication, which will provide a bridge between younger and older presbyopic patients. Younger patients who are only beginning to experience presbyopia will be candidates for these medications. However, once the patient is truly presbyopic with little function in the intermediate and near range and the presbyopia-correcting medication is not able to restore functional near vision, the benefit of providing a full range of vision is much higher. By this point, it is more likely that the patient has a posterior vitreous detachment, so we are more comfortable offering RLE.

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Presbyopia-Correcting IOLs and RLE



Surgeons can choose from a variety of advanced technologies to customize outcomes.

BY KENDALL E. DONALDSON, MD, MS

Refractive surgeons have an expanding array of intraocular lens (IOL) technologies that we can use to meet patients' goals and expectations from refractive lens exchange (RLE; Figure).

Each lens offers a slightly different profile of benefits and limitations, enabling us to better customize this process and experience.

CUSTOMIZED CARE

With our many lens options, it is important to know as much as possible about each patient to customize the process.

We need to gather information about what our patients do for a living, how they spend their spare time, and even how tall they are to estimate their reading distance. The Dell questionnaire is a very useful tool to improve efficiency in acquiring this information during examinations.

Ideally, we should send patients information about lens options before they arrive for their appointment, which increases efficiency. We should invest the time to educate our staff about premium lenses to ensure consistent understanding and communication with patients throughout their cataract surgery experience.

I inform patients that we have a range of options. Based on my examination and the patients' expectations, I make a very specific recommendation and explain my selection.

"If patients do not understand the compromises involved, it can lead to dissatisfaction after surgery."

Although we can customize treatment with our advanced technology lenses, we need to shape patients' expectations. Some surgeons find it difficult to talk about the limitations of IOLs, but that is critical. If patients do not understand the compromises involved, it can lead to dissatisfaction after surgery.

Research has shown that the younger the patient is, the higher the likelihood of postoperative dissatisfaction after RLE.¹ Older and younger groups have different expectations based on their daily needs and activities, as well as their baseline vision at the time of presentation. For example, a younger presbyopic patient who had previous corneal refractive surgery may want to achieve the same excellent vision with RLE as they had following their LASIK procedure. These younger postrefractive patients with milder cataracts will have higher expectations than older patients with denser cataracts.

Images courtesy of Kendall E. Donaldson, MD, MS.

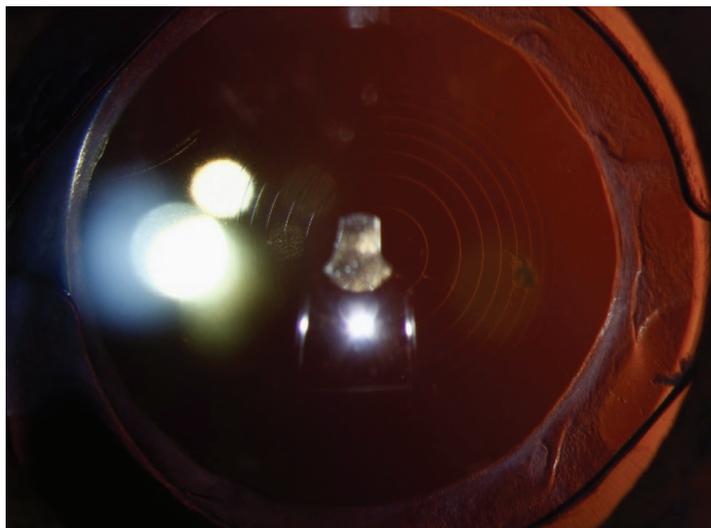
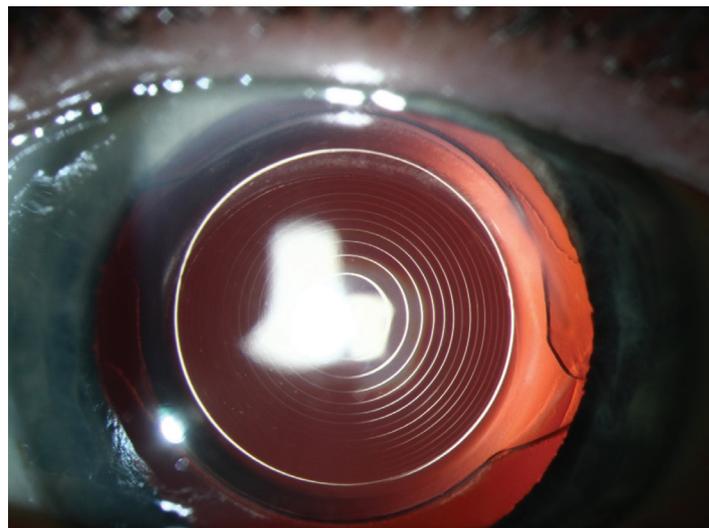


Figure. Well-centered multifocal IOLs.





CONSIDERING THE OPTIONS

The Eyhance enhanced monofocal IOL (Johnson & Johnson Vision) offers slightly more visual range compared with other traditional monofocal IOLs.² It has an aspheric design but also has a unique continuous change in power from the periphery to the center of the lens on the anterior surface of the IOL. This unique anterior surface increases range while maintaining image quality.² It uses spherical aberration to slightly flatten the defocus curve, so it does not drop off rapidly from distance vision, creating a slight plateau between distance and intermediate. I use this lens in patients who indicate in our lens discussion that they are not willing to accept any degree of glare and halo.

The aspheric design of the enVista IOL (Bausch + Lomb) is reported to maximize depth of focus.³

To obtain adequate near vision while maintaining good distance vision with both of these IOLs, we need to target the nondominant eye for approximately -1.25 D, or mini-monovision.

Alternatively, I may implant the wavefront-shaping Acrysof IQ Vivity extended depth of focus (EDOF) IOL (Alcon). It has a positive side-effect profile and a bit more range than a standard monofocal IOL.⁴ I use mini-monovision to obtain near vision, targeting -0.50 D in the nondominant eye. If you compare the defocus curves of this IOL versus a monofocal or enhanced monofocal IOL, the plateau is slightly larger between distance and intermediate. It also has a bit more of a plateau compared with a typical multifocal IOL, which has a steep dropoff for individual focal points at distance, intermediate, and near.

The Tecnis Synergy hybrid EDOF/multifocal IOL (Johnson & Johnson Vision) and AcrySof IQ PanOptix trifocal IOL (Alcon) provide the most complete range of vision, but patients need to know there is a greater risk of halos and glare.^{5,6} The hybrid EDOF/multifocal IOL is often a good option for highly myopic patients who want crisp near vision; the near point is a little closer than that of the PanOptix trifocal lens.

The Light Adjustable Lens (RxSight) has been researched for the past 20 years and is the first of a series of lenses that enable us to fine-tune the lens multiple times after surgery.⁷ This is

"To achieve optimal outcomes and meet patients' expectations, we need to understand each lens type and know our patients better than we ever have before."

useful in patients with a challenging cornea or previous laser vision correction. In my experience, we can achieve better than 20/20 vision in more patients and expand their range of vision with different degrees of monovision.

Some physicians have dedicated their practices to primarily serve patients with light adjustable IOLs or are working with optometrists who can perform postoperative adjustments (in certain states). This may introduce some logistical compromises, and workflow may need to be altered to account for the increased commitment of postoperative care for adjustments.

CONCLUSION

In the past 10 years, we have experienced a technology explosion that has brought a range of premium IOLs, more efficient phacoemulsification systems (with the femtosecond laser), and additional technologies that perform more precise preoperative measurements.

To achieve optimal outcomes and meet patients' expectations, we need to understand each lens type and know our patients better than we ever have before.

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Small Aperture Optics for RLE



Small aperture IOLs offer a full range of vision without visual aberrations.

BY JOHN A. VUKICH, MD

Refractive lens exchange (RLE) is being performed more frequently for patients who want to reduce their dependence on spectacles but who are unsuitable candidates for laser vision correction because of a high refractive error or presbyopia.

Advances in intraocular lens (IOL) technologies offer excellent visual outcomes for RLE, which is a permanent and stable refractive surgery option. Among the range of available options, small aperture IOLs offer a full range of vision by filtering out unfocused peripheral rays of light while the central rays reach the retina (Figure 1).

BENEFITS OF SMALL APERTURE IOLS

In a prospective, multicenter, nonrandomized pivotal trial of patients with 1.50 D of corneal astigmatism or less, 343 subjects received small aperture IC-8 IOLs (AcuFocus) in one eye and a monofocal or monofocal toric IOL in the other eye, and 110 subjects received bilateral monofocal or monofocal toric IOLs.¹ Patients receiving small aperture IOLs achieved superior near and intermediate vision and comparable distance vision compared with patients with bilateral monofocal IOLs. Patients with small aperture IOLs had a low level of visual symptoms, binocular contrast sensitivity similar to monofocal IOLs, and 2.21 D of distance-corrected extended depth of focus (EDOF) at 20/32 (Figure 2).

In addition to providing near vision and depth of focus, small aperture IOLs negate astigmatic blur up to 1.50 D. Consequently, we are less concerned about residual astigmatism, which can impact visual results from multifocal or other EDOF IOLs that are sensitive to residual astigmatism.

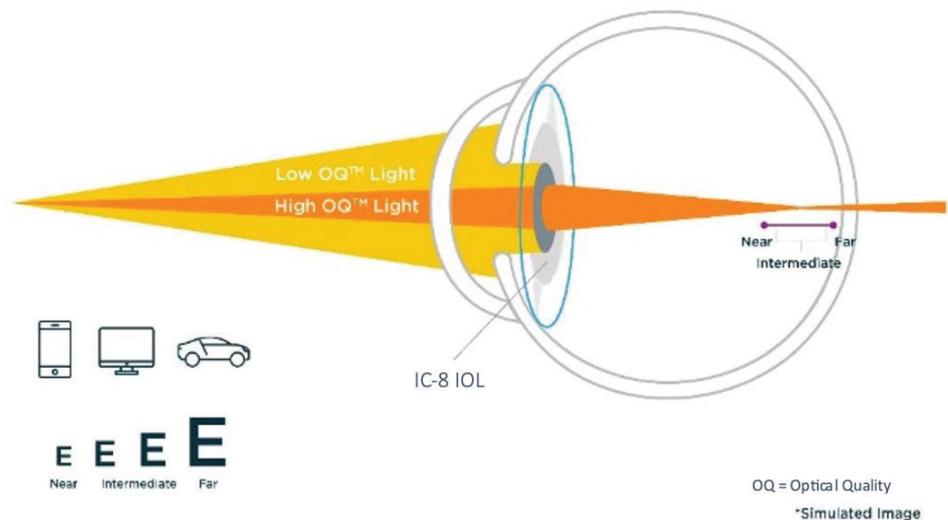
Small aperture IOLs also have a large landing zone. We have a sweet zone of approximately 1.50 D, making it easier to deliver excellent distance visual acuity.

A major part of achieving patient satisfaction comes from attaining precise distance vision. When IOLs achieve accurate distance vision and neutralize

astigmatism, patients are more likely to be satisfied with their results.

PATIENT EDUCATION

When discussing lens options with patients, I want to know their expectations and I recommend the best technology for each person rather than presenting an array of options. They want to see



Images courtesy of Acufocus

Figure 1. Design of small aperture IOL, which filters out unfocused peripheral light rays while the central rays reach the retina.

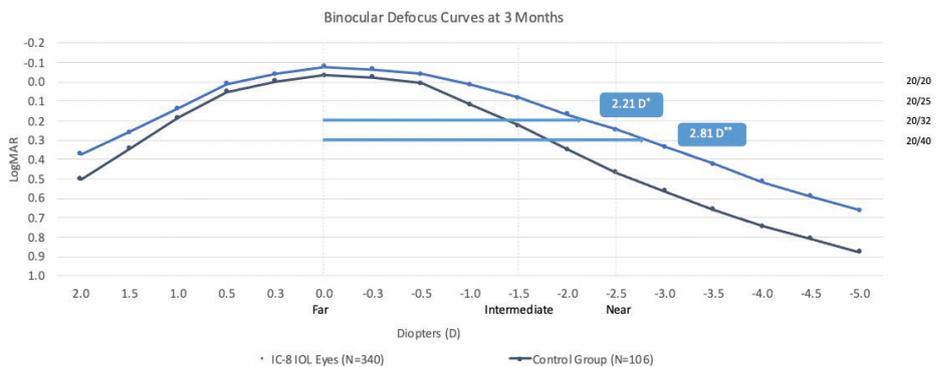


Figure 2. Patients treated with a small aperture IOL achieved 2.21 D* of continuous binocular distance-corrected extended depth of focus.¹



"The desire for an active lifestyle is driving the interest in refractive cataract surgery, and RLE is part of that continuum."

better, with greater spectacle independence, and they expect an educated opinion as to what will provide optimal visual outcomes. They do not want to become optical experts or choose something they do not understand.

With the recent FDA approval of pilocarpine hydrochloride ophthalmic solution for presbyopia, which constricts the pupil to improve near vision, patients are learning about the visual benefits of a small aperture.^{2,3} The medication is an excellent gateway for RLE and facilitates the discussion that suitable candidates may achieve a degree of near acuity and depth of focus with a small aperture.

We can even use the medication as a trial if it constricts the pupil to 1.8 or 2 mm. However, it does not always reduce the pupil sufficiently for a valid demonstration of visual improvement and depth of focus, and I do not require it as a trial before implanting a small aperture IOL.

Patients need to understand that no technology can provide the vision they had when they were 20 years old. The small aperture IOL will help them achieve good distance, intermediate, and near vision, but they may need reading glasses to read small print.

If patients prefer to have accurate vision at every distance without occasionally using reading glasses, we can offer a multifocal IOL, but we explain that there are associated visual aberrations.

"It is very likely that presbyopia medication will be a revelation to patients that helps them understand there are alternatives to glasses for presbyopia."

CONTINUUM OF CARE

We are treating cataracts in patients with a much lower level of disability than we did in the past because we know we can achieve a very high level of patient satisfaction. A generation ago, surgeons extracted cataracts when they were "ripe" and patients had significant disability. Then we believed the risk/benefit of cataract surgery justified the procedure. Since surgery became safer and more reliable, techniques allowed more rapid healing, and the implant selection process became much more accurate, we no longer wait until the cataract disables the patient. Patients who are 65 years old want to be able to engage in all of the activities they can, such as driving at night, with the best vision possible.

The desire for an active lifestyle is driving the interest in refractive cataract surgery, and RLE is part of that continuum. We can apply the same technologies that we use in refractive cataract surgery for RLE in patients with treatable refractive errors but minimal or no lens opacity.

We believe that patients who have been using presbyopia pharmaceutical drops will seek RLE sooner, as their presbyopia progresses and their drops become less effective. It is very likely that presbyopia medication will be a revelation to patients that helps them understand there are alternatives to glasses for presbyopia. If we treat presbyopia pharmacologically, they may want to consider RLE to reduce their need for glasses if they do not like the side effects associated with drops or no longer want to use them.

CONCLUSION

It is very satisfying to implant small aperture IOLs in RLE. They reduce the risk of dissatisfaction, do not create visual aberrations, and neutralize astigmatism as great as 1.50 D. We can be more confident when using the small aperture IOL that we will achieve the visual result we target, making it easier to recommend this IOL with confidence.

1. AcuFocus. Data on file.

2. ClinicalTrials.gov identifier: NCT03804268. <https://clinicaltrials.gov/ct2/show/NCT03804268?term=NCT03804268&draw=2&rank=1>. Accessed June 24, 2022.

3. ClinicalTrials.gov identifier: NCT03857542. <https://clinicaltrials.gov/ct2/show/NCT03857542?term=NCT03857542&draw=2&rank=1>. Accessed June 24, 2022.



Communicating With RLE Patients



Patients increasingly welcome the benefits of RLE.

BY STEVEN J. DELL, MD

In our practice, we have been performing refractive lens exchange (RLE) for years, and it is well known in our community that we offer this option.

Many patients who come to our practice for RLE had laser vision correction years ago and now want a procedure that will carry them through the next stage of their lives. In some cases, candidates may be younger patients with cataracts that do not yet require surgery. They already know about the potential benefits of these implants, so they are interested in RLE to reduce their dependence on glasses.

INITIAL COMMUNICATION

Some patients come to our practice seeking laser vision correction to improve their vision, but they may actually be better candidates for RLE. We explain the limitations of laser vision correction in their case and why it may not be the best option for them. We take them through the entire educational process to explain what RLE is, how it might benefit them, and how the technology works.

It may be challenging to address a patient who is set on laser vision correction, but once we educate them about RLE, its value becomes obvious. Patients in their late 50s or early 60s are looking at the prospect of cataract surgery in the future, so if RLE is a better option for them now, we can usually articulate that message to them clearly.

Although our practice generally does not need to look for these patients, if I were going to market to RLE candidates, I would emphasize its ability to reduce dependence on reading glasses. We would use social media marketing channels to target specific demographics.

Patients usually are not deterred by the fact that RLE is not covered by insurance because it is well known in the community that refractive surgery is an out-of-pocket procedure. If patients are concerned about the cost, we focus on the value proposition in our discussion. We might ask them what else they own that they use every waking moment and will continue to use for the rest of their lives. One could reason that performing RLE earlier gives them a longer duration of benefit compared with cataract surgery performed 10 years later. We balance this discussion by addressing the risks of RLE with the patient.

Recently introduced presbyopia-correcting medication (pilocarpine hydrochloride ophthalmic solution) may function as a gateway for patients who want to correct their presbyopia. Future presbyopia-correcting medications may provide even more benefit.

Many patients with presbyopia never see an eye doctor for correction because they simply buy drugstore reading glasses. However, presbyopia-correcting eye drops will bring a new segment of that market into our practices. I believe some of these patients will transition from a daily eye drop to a surgical procedure.

"Many patients who come to our practice for RLE had laser vision correction years ago and now want a procedure that will carry them through the next stage of their lives."

Balancing risks and benefits is an important part of our surgical discussion because RLE is a completely elective procedure. For example, if the patient has high myopia, we are much more concerned about retinal tears or detachments than we are in a patient who has high hyperopia. Those clinical features need to be evaluated and reviewed with the patient before any elective surgery.

PLANNING FOR SUCCESS

Patients seeking RLE typically have good vision with glasses, so they have high expectations regarding their visual performance after surgery. The intraocular lens (IOL) that we choose must provide good quality near, intermediate, and distance vision. In their search for a greater range of vision, if they choose a multifocal IOL with an increased risk of nighttime dysphotopsia, we need to be sure they are prepared to make that compromise. Therefore, we need to discuss the patient's expectations in advance at length.

Patients also need to know that they may not attain perfect vision postoperatively because everyone heals differently. They may require a refractive enhancement with laser vision correction or another option to achieve the desired endpoint.

As with refractive cataract surgery, it is critical to optimize the ocular surface preoperatively in RLE patients receiving presbyopia-correcting IOLs.

CONCLUSION

RLE is an incredibly valuable tool that helps our patients achieve their visual goals. Early adopters did the heavy lifting 10 to 15 years ago. Now we have almost an entire generation of presbyopic and precataract patients who recognize RLE as an option and understand that it is not covered by insurance.

Fifteen years ago, our patients did not come in asking for RLE, but now our patients pursue this procedure because a friend or family member has shared their experience. That has been the impetus behind much of the growth in this segment of our practice, along with the fact that we have much better IOL technology than we did 15 years ago. ■

A Modern Guide to Refractive Lens Exchange: Expert Guideline Recommendations for the Modern Refractive Cataract Practice

Release Date: August 2022
Expiration Date: September 2023

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://evolvemeded.com/course/2209-supp>. If you experience problems with the online test, email us at info@evolvemeded.com. *NOTE: Certificates are issued electronically.*

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Full Name _____ DOB (MM/DD): _____

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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

___ MD/DO	Years in Practice	Patients Seen Per Week	Region
___ OD	___ >20	(with the disease targeted	___ Midwest
___ NP	___ 11-20	in this educational activity)	___ Northeast
___ Nurse/APN	___ 6-10	___ 0	___ Northwest
___ PA	___ 1-5	___ 1-15	___ Southeast
___ Other	___ <1	___ 16-30	___ Southwest
		___ 31-50	
		___ >50	

LEARNING OBJECTIVES

Did the program meet the following educational objectives?

Agree Neutral Disagree

Identify the definition, prevalence, etiology, and key characteristics of patients who are candidates for refractive lens exchange

Describe how the latest presbyopia-correcting IOL technologies and pharmaceutical presbyopia treatments can create new groups of satisfied refractive lens exchange patients

Outline strategies for finding, communicating with, and educating patients about refractive lens exchange clinical outcomes, costs, risks, and benefits, including quality-of-life and quality-of-vision considerations

POSTTEST QUESTIONS

Please complete at the conclusion of the program.

1. Based on this activity, please rate your confidence in your ability to identify patients who are candidates for refractive lens exchange (RLE; 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. The enhanced monofocal intraocular lens (IOL) has the following characteristic:
 - a. It has more of a plateau than typical multifocal IOLs
 - b. It has a beam-shaping element, offering more intermediate vision
 - c. It uses spherical aberration to slightly flatten the defocus curve, so it does not drop off rapidly from distance vision
 - d. None of the above
3. _____ IOLs filter out unfocused peripheral rays of light while the central rays reach the retina.
 - a. Trifocal
 - b. Monofocal plus
 - c. Light Adjustable Lens
 - d. Small aperture
4. The hybrid extended depth of focus/multifocal IOL has the following characteristic(s):
 - a. It can be fine-tuned multiple times after surgery
 - b. It has a greater risk of halos and glare
 - c. It is a good lens for patients who cannot tolerate halos and glare
 - d. All of the above
5. What is one main factor that has driven the increase in RLE surgery?
 - a. IOL advances
 - b. Patients seek RLE instead of LASIK or PRK
 - c. Surgeons achieve refractive results within 97% of the desired refractive outcome
 - d. Decreases in IOL costs
6. Which statement is true?
 - a. RLE results are permanent, with only minimal corneal changes that occur during subsequent decades
 - b. LASIK results tend to be permanent, especially in patients with hyperopia
 - c. RLE cannot correct high hyperopia
 - d. LASIK is the best option for presbyopic patients who want to reduce their dependence on spectacles at all distances
7. Which of the following IOL(s) is/are associated more often with halos and glare that may be unacceptable for frequent night driving?
 - a. Nondiffractive extended depth of focus IOLs
 - b. Trifocal IOLs with diffractive optics
 - c. Light Adjustable Lens
 - d. A & C
8. Which patients are more likely to have higher expectations of RLE?
 - a. Patients with cataracts that impair their vision
 - b. Patients with early signs of glaucoma
 - c. Patients who use contact lenses for monovision
 - d. Younger patients without cataracts who see well with glasses or contact lenses
9. Small aperture IOLs can neutralize astigmatism as great as _____.
 - a. 1.00 D
 - b. 1.25 D
 - c. 1.50 D
 - d. 2.00 D
10. Which patient is more likely to be an RLE candidate?
 - a. Someone with low myopia between the ages of 20 and 35
 - b. Someone with early signs of retinal pathology
 - c. Someone needing an enhancement after laser vision correction
 - d. Someone with presbyopia and cataracts that do not yet require surgery who would like to reduce their dependence on spectacles
11. Patients with _____ were reported to be especially at risk of retinal detachments or tears after RLE.
 - a. Astigmatism
 - b. High myopia
 - c. Presbyopia
 - d. High hyperopia

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.
