

FOUR PATIENTS FIVE EXPERTS

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BY MARY WADE, CONTRIBUTING WRITER

New presbyopia treatments, such as the corneal inlays Kamra and Raindrop, are slowly wending their way through the U.S. Food and Drug Administration approval process. Entirely new approaches to intraocular lenses (IOLs) are in development internationally. Meanwhile, patients arrive in your office daily, seeking better vision without reading glasses. What are the best treatments to offer them right now?

EyeNet asked five leading refractive surgeons to review four hypothetical patients with presbyopia or pre-presbyopia. The differing recommendations made by these clinicians illustrate the range of valid approaches.

The surgeons emphasize that, in all cases, it's critical to conduct a thorough assessment, talk with patients about their vision priorities, discuss the pros and cons of various approaches, and mention the option of "watchful waiting"—that is, forgoing treatment for the time being. When patients are considering corrective surgery, one of the surgeon's most important tasks is to help them form realistic expectations regarding visual outcomes and possible complications. (See "Counseling Caveats.")

For those patients who choose to pursue vision correction surgery, the perspectives presented by these refractive experts can help to guide treatment choices with today's technologies.



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PATIENT:

60-year-old hyperopic woman with presbyopia.

PROBLEM:

She wants improved vision without eyeglasses, as she hates wearing them.

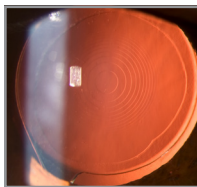
PRESENTS WITH:

UCVA	20/50 OD	20/70 OS
UCVA at near	J4 OD	J5 OS
BCVA	20/20 OD	20/20 OS
Refraction	OD +1.50 -0.50 × 180 = 20/20	
	OS +2.25 -0.50 × 160 = 20/20	
Slit-lamp exam	Clear lenses OU	

DR. ROSENFELD: Because neither her distance nor near vision is perfect, and she’s aged 60, this patient is an ideal candidate for refractive lens exchange (RLE). This involves removing the lenses before cataracts develop, but this patient would probably need cataract surgery soon, in any case.

I’d prefer multifocal lenses for her, as they offer both good distance and reading vision. Crystallens, the only FDA-approved accommodating lens, is good for distance and intermediate vision but variable for reading, in my experience. Since patients are paying a premium for these lenses, we need to feel confident that RLE will provide reliable results. This patient should enjoy long-lasting vision improvement from RLE.

Another RLE option would be monovision using standard monofocal lenses, with one for distance vision and the other for near. Surgeons should be aware that the Academy’s *Preferred Practice Pattern* recommends a trial of monovision using contact lenses to assess whether the patient can adapt to it.¹



A multifocal IOL such as the Alcon ReStor is one option for refractive lens exchange.

I don’t consider LASIK or PRK appropriate for patients like this. With hyperopic LASIK or PRK, regression will often occur; the greater the initial hyperopia, the sooner regression may occur. So she might need another solution within five years. And when patients

eventually need cataract surgery, prior refractive surgery may make accurate refraction difficult and constrain lens choices. It makes sense to leave the corneas pristine in older patients.

DR. YOO: First, I’d like to offer my general perspective. Vision correction surgery and cataract surgery—my areas of specialty—are increasingly overlapping and blending. I judge outcomes on how closely we meet the refractive target; by this standard, laser vision correction always outperforms cataract surgery and RLE, even in very skilled hands. Why? Because individual biologic and anatomic factors are more likely to impact outcomes in cataract surgery and RLE. Outcomes data consistently show that fewer eyes achieve a result within 0.5 D of the desired target with cataract surgery than with laser vision correction. When our primary goal is improved refraction or reduced dependence on glasses, I favor laser vision correction for patients with clear lenses, irrespective of age in most cases.

Surgeons often base their threshold for RLE on patient age. But I would argue that age alone isn’t always the best barometer of how soon cataract may develop. Aging varies widely, and cataract development involves multiple factors such as genetics, oxidative stress, UV light exposure, and smoking status.

We could achieve quite good results for this patient using LASIK, with the new hyperopia ablation profiles. Hyperopic PRK tends to have less long-term stability. This patient doesn’t want reading glasses, so we could give her monovision targeting -1 to -1.5 D in the nondominant eye.

If she didn’t adapt well to monovision during her contact lens trial, the next best option would be RLE with multifocal lenses. I wouldn’t counsel this patient to wait for corneal inlays or presby-LASIK, since we have no way to know when FDA approvals may occur.

DR. MILLER: Though I’m a refractive surgeon who enjoys my profession, I always recommend the simplest, least invasive, and least expensive options first. Often, patients who’ve resisted contact lenses find that they’re satisfied with this solution once they try it.

If this patient tolerates monovision but doesn’t want to continue with contact lenses, I’d recommend LASIK or PRK. I’d explain that laser vision correction could limit her lens choices when she later needs cataract surgery; that she’d need to wear glasses when driving, or at least to pass the driving test; and that monovision could affect her depth perception. Assuming that she has normal

corneas, the choice of LASIK or PRK would depend on whether she had dry eye, anterior basement membrane dystrophy or disease, or another condition that indicates PRK. I'd target the right eye for -1.5 D.

A corneal inlay by itself wouldn't help this patient; she'd also need hyperopic LASIK to create monovision, and I don't know whether FDA protocols allow that.

DR. RANDLEMAN: Before treating any of these case study patients, I'd get their keratometry values and do corneal topography. Both are crucial for performing a thorough evaluation and setting refractive targets, especially for RLE. It's difficult to assess residual astigmatism based on refraction alone. I'll assume that keratometry and topography values are within normal limits for all four of these cases.

This patient's age indicates that she'd benefit most from a lens-based procedure. By 60 almost everyone has some loss of vision quality, especially contrast sensitivity, due to cloudiness of the natural lenses, even in the absence of visually significant cataract. Assuming she has little astigmatism, she would do well with multifocal lenses or with standard lenses set for monovision, if tolerable.

It's unlikely that either hyperopic LASIK or

a corneal inlay could give this patient the vision quality and longevity that RLE would provide.

DR. HENDERSON: RLE with multifocal lenses would be best. Given this patient's age, it's highly likely that her lenses will opacify in the near future. In some patients, multifocals cause halos around lights at night or reductions in night vision or contrast sensitivity. Since it's hard to predict who will have problems, I always operate on the non-dominant eye first. In the second surgery, if need be, I implant a monofocal or an accommodating lens in the dominant eye. Although 95 percent of patients are satisfied with multifocals, we can't predict whether a patient will be among the vulnerable 5 percent.

If she instead opted for corneal refractive surgery and there was a concern that she might develop haze, some surgeons would favor LASIK. We'd need to use topical mitomycin intraoperatively.

CONSENSUS: The experts agree that before any refractive surgery, patients need a trial with contact lenses (or eyeglasses) to get a sense of what their vision would be like after surgery and to allow the surgeon to optimally determine the refractive target. It takes time to discern whether a patient's visual system can adjust to monovision or to other corrective approaches under consideration.

COUNSELING CAVEATS

It is important to give patients who are considering presbyopia-correcting surgery realistic expectations about any recommended surgery. They will be far more accepting of surgical or optical complications that may occur if they were made aware of them before the procedure. The five experts recommend covering—at minimum—the following key points:

Laser vision correction, such as LASIK and PRK. With this approach, the existing accommodation remains intact, a plus for most patients under the age of 40 years and others who can read without glasses. Laser vision correction can cause postoperative glare and halos and night vision complaints, and can cause or exacerbate dry eye syndrome. IOL selection for subsequent cataract surgery may be more difficult or less accurate after laser vision correction.

Refractive lens exchange (RLE). Though this approach usually provides excellent uncorrected distance vision, it may contribute to nighttime glare and halos and reduced contrast sensitivity, due to IOL optics. It's not possible to predict who might develop these symptoms postoperatively. Patients should understand that RLE will not necessarily result in the glasses-free outcome they hope for: Accommodating IOLs may not provide adequate uncorrected near vision, while multifocal IOLs may not give adequate intermediate vision for things like computer work. As a form of intraocular surgery, RLE carries the risk of surgical complications, which, in rare cases, may be sight threatening.

Phakic IOL surgery. This approach is usually successful at correcting distance vision and preserving accommodation because the natural lens is kept in place. The risks of phakic IOL surgery include corneal edema, dislocated IOLs, glaucoma, and cataract formation. If cataract surgery is later performed, the phakic IOL must be removed before cataract extraction.

Watchful waiting. Given the drawbacks of many surgical interventions and the promise of presbyopia treatments on the horizon, clinicians may advise holding off on treatment. For many candidates, continuing to use spectacle or contact lens correction while awaiting new developments is a reasonable recommendation.



PATIENT:

40-year-old hyperopic man with pre-presbyopia; he is just beginning to hold reading material farther away in order to see clearly.

PROBLEM:

He has fairly good vision and accommodation, but he doesn't want to wear reading glasses.

PRESENTS WITH:

UCVA	20/30 OD	20/25 OS
UCVA at near	J1 OD	J1 OS
BCVA	20/20 OD	20/20 OS
Refraction	OD +1.75 sphere = 20/20	
	OS +2.00 -0.75 x 090 = 20/20	
Slit-lamp exam	Clear lenses OU	

DR. MILLER: Hyperopes tend to develop symptomatic presbyopia sooner than myopes, since they've been coping with their near vision deficits through accommodation. I'd first determine this patient's latent hyperopia by performing a cycloplegic refraction so we'd know what we're dealing with. He might actually be +3 and +4; if we corrected him for +1.75 and +2 with refractive surgery, when his latent hyperopia showed up a few years later he'd understandably be very dis-

satisfied. I'd start him with distance-correcting contact lenses, which could buy him five years of visual happiness.

When he again becomes symptomatic, we could consider monovision LASIK or PRK. An alternative would be distance-correcting PRK or LASIK in one eye, combined with a corneal inlay in the nondominant eye.

DR. ROSENFELD: You've got to be extra careful with this type of patient, one who's seeking improvement for fairly good vision. Some surgeons might argue for a corneal inlay in the left eye, where he has a little astigmatism, making that the reading eye and preserving the right eye for distance. Problems would include not having perfect distance vision in either eye, which would make him less likely to love monovision. So I would recommend an inlay only if he consented to hyperopic LASIK on the fellow eye.

DR. YOO: I'd recommend hyperopic LASIK, correcting for distance in one eye and targeting -0.5 D in the other eye to give him good uncorrected distance vision, improved near and intermediate vision, and probably 10 symptom-free years. After that, he could receive retreatment if deemed appropriate on reevaluation.

DR. RANDLEMAN: I consider this the most challenging of the cases presented. The patient is not a great candidate for any option.

His refractive values are probably based on a cycloplegic exam rather than his actual daily vision. Soon he'll experience a fairly rapid drop-off in vision quality. Some patients who are still

OMIC GUIDELINES FOR RLE

As part of its underwriting requirements, the Ophthalmic Mutual Insurance Company (OMIC) has a few key patient selection guidelines for refractive lens exchange. OMIC considers exceptions to these recommendations on a case-by-case basis.

1. Myopic patients must:

- Be presbyopic
- Be age 40 or older
- Have at least 5 D and not more than 15 D of myopia if a posterior vitreous detachment is not present
- Have at least 5 D and not more than 20 D of myopia if a posterior vitreous detachment is present

2. Hyperopic patients must:

- Have an axial length of at least 20 mm
- Have uncorrected visual acuity of 20/40 or worse
- Patients age 40 and older must:
 - Be presbyopic
 - Have at least 1 D and not more than 15 D of hyperopia
- Patients under age 40 must:
 - Have at least 4 D and not more than 15 D of hyperopia.

For a complete summary of OMIC's requirements applicable to RLE, please refer to the Refractive Lens Exchange Application available at www.omic.com/policyholder/rle-application.

accommodating can't tolerate full correction of their refractive error. Since hyperopic LASIK is irreversible, we'd want to be sure he'd do well with it before surgery.

He'd probably get the best, most-lasting vision quality from a corneal inlay plus hyperopic LASIK. Inlays offer reversibility: Studies show that when inlays are removed, most patients return to their previous vision level.

CONSENSUS: The experts agree that RLE would be overly aggressive for a midlife patient like this, who has fairly good vision, clear lenses, and accommodation. Dr. Henderson added that today's IOLs can't equal the performance of the natural lens for most patients younger than 45. And Dr. Randleman noted that IOLs will probably be significantly improved by the time this man needs cataract surgery.



PATIENT:

35-year-old hyperopic woman who currently wears contact lenses.

PROBLEM:

Giant papillary conjunctivitis (GPC) is causing her to be increasingly intolerant of contact lens wear.

PRESENTS WITH:

UCVA	20/60 OD	20/60 OS
UCVA at near	J2 OD	J2 OS
BCVA	20/20 OD	20/20 OS
Refraction	OD +3.50 -0.50 × 105 = 20/20	OS +4.00 -0.75 × 075 = 20/20
Slit-lamp exam	Clear lenses OU	

OVERVIEW: Dr. Yoo and Dr. Henderson think that RLE is not optimal for this patient because she has clear lenses and accommodation. Dr. Randleman and Dr. Rosenfeld would consider RLE, but they take differing approaches.

DR. YOO: I assume she no longer wants to use contact lenses. We can now successfully treat patients with her level of hyperopia or higher with laser

vision correction; +4 is my own upper limit. Correcting both eyes for distance would also allow her to read well for more than five years, after which she might need reading glasses.

DR. RANDLEMAN: This patient is near the upper limit of my comfort zone for hyperopic LASIK, which is 3.5 to 4 D. If she is seeking spot-on vision, she would need to be informed that the higher level of treatment required could lead to regression relatively soon after the procedure.

Though she's young, it's reasonable to discuss RLE. If she'd accept reading glasses, monofocal lenses could provide good distance vision and keep her options open in case an excellent add-on lens becomes available. If she were interested in multifocals, she'd need to understand their benefits and limitations. Younger, active people may not be as satisfied with RLE as older patients usually are.

Using monofocal IOLs to correct her distance vision, plus a corneal inlay in one eye to improve near, would preserve reversibility.

DR. ROSENFELD: Even though she's only 35, I think RLE would give this patient better, more-lasting vision correction than other options. Accommodating lenses, my first choice for her, would probably make her very happy with both her distance and near vision. She's been used to good vision with contact lenses, so we need a solution that will greatly improve her vision quality.

I don't think a corneal inlay would be great for this patient, since her level of hyperopia would make the resulting monovision unsatisfactory.

DR. MILLER: I assume that this patient is seeking treatment for GPC, a problem that occurs in people who wear extended-use soft contact lenses. Lipids and proteins build up on these lenses, and the conjunctiva mounts a chronic allergic response. To recover, this patient would have to switch either to rigid gas-permeable (RGP) contact lenses, which could also help correct her astigmatism, or to daily disposables.

If RGP doesn't work, or she wants a different option, I'd consider LASIK rather than PRK (based on her age and assuming that she's otherwise eligible for LASIK), correcting for distance in both eyes at 3.5 or 4 D. When she's 45 or older, a corneal inlay could be added. Or a monovision enhancement for reading could be considered, assuming that she had sufficient corneal thickness and her percent tissue altered (PTA) was not more than 40 percent, a threshold we should never exceed.

CASE 4



PATIENT:

52-year-old myopic man.

PROBLEM:

He hates wearing glasses when out socially and for sports; he can't wear bifocals and loves reading without glasses.

PRESENTS WITH:

UCVA	20/200 OD	20/100 OS
UCVA at near	J1+ OD	J1+ OS
BCVA	20/20 OD	20/20 OS
Refraction	OD -3.50 -1.00 × 180 = 20/20	OS -4.00 -0.75 × 180 = 20/20
Slit-lamp exam	Clear lenses OD	Small posterior polar cataract OS

OVERVIEW: Drs. Yoo and Rosenfeld agree that this sports-focused patient probably would not opt for monovision because of the possibility of altered depth perception. Both surgeons said that their male patients are more likely to refuse monovision, or to adapt to it less well, than women.

DR. RANDLEMAN: The key to this patient is his love of reading without glasses. I'd let him know that any refractive surgery would probably decrease the quality of his near vision and suggest that he might be happiest wearing daily disposable contact lenses only for distance vision.

People may be aware of the times when they don't like their vision but neglect to consider how often they do like it. This patient probably needs excellent distance vision only a few hours a day

for driving, or weekly to play sports, while he enjoys good near vision eight to 10 hours every day.

RLE could be done, but, since I assume he has astigmatism, if we used toric lenses we'd need to correct this and create modified monovision. In my experience, myopic patients don't tolerate multifocal lenses as well as others. For someone with a pretty functional visual system, the slight loss of clarity that multifocals may cause could be quite unwelcome.

DR. ROSENFELD: Patients like this man tend to treasure their hawk-like near vision. We'd need to be careful not to sacrifice that. But if playing sports without glasses is his highest priority, I'd recommend LASIK distance vision correction. Many myopes have good accommodation, so he might still be able to read without glasses. It might also be best to do nothing—just yet. Within a few years, improved accommodating or multifocal lenses may offer him better RLE options.

DR. YOO: If he wants to see well at distance and near, monovision laser vision correction would be best, although he's unlikely to accept it. I'd describe his options and trade-offs in detail and ask him what he wants to read, under what conditions: Is it the fine print of the newspaper stock pages or primarily his computer screen?

DR. MILLER: I would not recommend RLE for a patient of this age range who has this degree of myopia, as there's a risk of retinal detachment. A corneal inlay would be a reasonable alternative to traditional corneal refractive monovision, assuming that the patient could tolerate it. ■

1 American Academy of Ophthalmology. *Preferred Practice Pattern Guidelines: Refractive Errors & Refractive Surgery*. 2013. www.aaopt.org/ppp.

MORE ONLINE. Further discussion is at www.eyenet.org.

MEET THE EXPERTS

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