

# STRATEGIES FOR CORRECTING PRESBYOPIA | Surgeons share their preferences.

## Previsit Counseling Is Telling

Increasing maturity (ie, age) comes with reduced focusing adjustment (ie, accommodation). In patients with cataracts, the restoration of excellent visual function can be achieved through cataract extraction coupled with presbyopia technology.

### PREFERENCES AND PROCESSES

**In the surgical suite.** Table 1 shows our preferences for correcting presbyopia. Although most presbyopia-correcting IOLs can correct only 2.57 D of astigmatism, that is not an upper limit because lens technology can be combined with intrastromal corneal ring segments, laser arcuate incisions, and limbal relaxing incisions to allow presbyopia correction even in patients with 6.00 or 7.00 D of preoperative astigmatism. Short or long eyes may require a piggyback lens in addition to a presbyopia-correcting lens.

**In the clinic.** Equally important to what occurs in the OR is what

happens before and after surgery. Previsit counseling using Surgiorithm's system has increased the percentage of our patients who elect to undergo astigmatic and presbyopia correction at the time of cataract surgery from 43% to 53%. This system synergizes educational videos, a lifestyle questionnaire, and information on available options.

During the preoperative visit, patients learn that they may see rings after surgery because of lens-edge effects, will likely have dry eyes for a few months postoperatively, will likely need laser treatment for scar tissue behind the lens implant in 4 to 12 months after surgery, and may need a free touch-up for residual astigmatism or refractive error. Preoperative measurements are typically performed on at least two different occasions for patients who have a history of radial keratotomy to improve accuracy, and counseling addresses the lower precision of



preoperative measurements in these eyes and the higher touch-up rate as a result. No matter the patient, it is essential to optimize the corneal surface before planning presbyopic cataract surgery (Table 2).

Younger patients without cataracts are offered refractive lens exchange (RLE), especially if they have high refractive errors, or monovision LASIK with a general target of -1.25 D sphere in the nondominant eye if they are not highly dependent on depth perception. In patients who have not tried monovision before, we first perform a contact lens trial.

Caution is required when treating patients in the zone of emmetropia or low myopia (0 to -3.00 D) because they have adapted well to their situation. Rocking the boat, so to speak, can be traumatic. These patients assume that they will retain their preexisting focal point and their quality and range of vision and that their visual function will increase. In reality, there are trade-offs. We ask patients specifically if they read without glasses and if they will be okay with a change in their near point.

### CONCLUSION

In the future, patients with presbyopia but not cataracts and patients with low myopia may benefit from presbyopia-correcting eye drops. For now, however, we prefer the presbyopia-correction methods discussed herein.

**TABLE 1. TOOLKIT FOR PRESBYOPIA\***

Equipment	Application
Femto LDV Z8 femtosecond laser	Arcuate incisions, capsulotomy, lens chop
Argos-Verion integrated digital marker microscope	Lens centration, incision placement, and multifocal toric IOL alignment
ORA	Intraoperative aberrometry
Lenses	Application
AcrySof IQ PanOptix	Used for most patients
AcrySof IQ Vivity	<ul style="list-style-type: none"> <li>• Patients with near point of 2.00 D (19.7 inches) or less</li> <li>• Mild corneal scar, mild epiretinal membrane, prior radial keratotomy</li> <li>• Need to minimize night halos; willingness to use reading glasses for fine work (can enhance near vision with a target of -0.50 D for nondominant eye)</li> </ul>
Tecnis models ZLB00/ZLU	Patients with high myopia and/or a very close desired near focal point
Tecnis models ZKB00/ZKU	Patients with history of myopic LASIK, high positive corneal spherical aberration, and a desired near point of approximately 2.20 D (17.9 inches)

\*Manufacturing information: Femto LDV Z8 (Ziemer); Argos, Verion, ORA, AcrySof IQ PanOptix, AcrySof IQ Vivity (Alcon); Tecnis Multifocal, Tecnis Multifocal Toric II (Johnson & Johnson Vision).

STRATEGIES FOR CORRECTING PRESBYOPIA

Corneal challenge	Preoperative or Concurrent Management
Keratoconus	Intrastromal corneal ring segments
Salzmann nodules, pterygium	Lesion removal, amniotic membranes
Epithelial-basement membrane dystrophy	Debridement and polishing, amniotic membrane
Significant ocular surface inflammation	Blepharitis therapy
Clinically significant Fuchs dystrophy	DMEK (done by a DMEK expert) combined with AcrySof IQ PanOptix or AcrySof IQ Vivity lenses (targeting -0.50 D of myopia)

Abbreviation: DMEK, Descemet membrane endothelial keratoplasty; Manufacturing information: AcrySof IQ PanOptix and AcrySof IQ Vivity (Alcon)

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## An Overview of Past and Current Solutions

I had relatively few options for correcting presbyopia when I started practice in 2007. Monofocals were the most commonly used lenses, and I opted for monovision strategies in select patients. My approach was conservative in patients with mild glaucoma or retinal pathology; I targeted emmetropia or mild myopia and prescribed spectacles. My approach has evolved with advances in lens technology.

**THEN**

Multifocal IOLs can decrease contrast sensitivity, which is a problem in patients whose vision has been compromised by glaucoma or retinal disease. For patients with glaucoma or retinal disease, my earliest choice of a presbyopia-correcting IOL was the Crystalens (Bausch + Lomb), which provided distance acuity comparable to that achieved with a monofocal IOL and better contrast sensitivity and uncorrected intermediate visual acuity than a multifocal IOL.<sup>1</sup>

Later, I transitioned to using the AT LISA 839 MP (Carl Zeiss Meditec) or the FineVision (PhysIOL) for patients with relatively uncompromised central visual fields and stable glaucoma.

**NOW**

Some of the latest presbyopia-correcting IOLs can improve near and intermediate visual acuity without

reducing contrast sensitivity as much as earlier generations of these IOLs.

The Lentis Comfort LS-323 MF15 IOL (Teleon Surgical) has a low near add (+1.50 D) and acts like an extended depth of focus (EDOF) lens. This IOL is built on the company's Mplus platform. I typically use the Düsseldorf strategy in normal eyes and in patients who have glaucoma or retinal disease. With this approach, emmetropia is targeted in either the dominant or better-seeing eye, and -0.50 D is targeted in the nondominant or worse-seeing eye to produce a mini-monovision effect.

For patients with full visual fields, I implant a Lentis Comfort lens in the dominant eye and either a Lentis Mplus MF20 or MF30 in the contralateral eye, depending on the patient's visual needs. I have been using this strategy for most of my patients and have found that it enhances visual performance at both intermediate and near.

Compared with monofocal lenses, EDOF IOLs do not seem to affect visual field sensitivity. I have safely implanted EDOF IOLs in glaucoma patients with mild visual field loss not affecting the central 10°.

Takahashi et al<sup>2</sup> compared the mean deviation (MD) in eyes implanted with bifocal, EDOF, and monofocal lenses. MD was -0.24 ±0.58 dB in the EDOF group, -1.38 ±0.58 dB in the bifocal group, and

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36.6 ±1.4 dB in the monofocal group. In both MD and foveal threshold, there was a significant difference between the bifocal and the EDOF and monofocal groups (*P* < .001) but no difference between the EDOF and the monofocal groups. In my experience, EDOF IOLs afford a better quality of vision for my patients who have glaucoma without compromising visual field monitoring.

I have used the aforementioned strategy for patients with mild to moderate glaucoma, those with a stable epiretinal membrane, and those with stable diabetic macular edema.<sup>3</sup> I seek to maximize the visual potential of the better-seeing eye and to improve functional near and intermediate visual acuity in the worse-seeing eye.

I look forward to using other EDOF lenses and accommodating lenses when they become available in the Philippines, where I practice.