

PHAKIC IOLS IN 2025

Expanded candidacy, improved safety, and smarter sizing



BY BRETT MUELLER II, DO, PHD

Phakic IOLs are having a renaissance thanks to improvements in lens design and evolutions in diagnostics, candidate selection strategies, and sizing methodologies. In recent years, phakic IOLs have become an increasingly viable—and often preferred—solution for a wider range of my patients—well beyond only those with high myopia.

The key to success is knowing where these lenses fit into the refractive surgery armamentarium, how to size them, and how to guide patients through the decision-making process.

BROADENED CLINICAL INDICATIONS

Historically, the use of phakic IOLs was limited to patients with high myopia who were poor candidates for corneal refractive surgery. Currently, I routinely offer these lenses to patients with moderate and even low myopia (≤ -2.50 D), especially those who are apprehensive about LASIK, are at risk of developing dry eye disease (DED)

after corneal surgery, or simply prefer a reversible option.

The age range for phakic lenses has also increased. I have successfully implanted these IOLs in select patients who were less than 21 years of age and had a stable refraction and in patients older than 45 years of age for whom refractive lens exchange posed an increased risk of retinal complications. In the latter group, I often employ a blended vision strategy to manage early presbyopia and am able to defer lens extraction until it is clinically warranted.

PRIORITIZING PATIENT PREFERENCES

Many phakic IOL candidates have delayed refractive surgery owing to concerns about permanent corneal alterations, trauma related to the LASIK flap, or postoperative DED. For these individuals, discovering an intraocular, cornea-sparing, accommodation-preserving alternative can be transformative. For example, I had a patient who was a member of a Special Weapons and Tactics unit

who was unwilling to undergo LASIK owing to the risk of flap-related trauma and another who was not a candidate for LASIK but whose DED rendered them intolerant of contact lens wear. Both felt comfortable proceeding with refractive surgery when the option of phakic IOL implantation was offered.

MODERN SIZING STRATEGIES

Successful outcomes with phakic IOLs depend on appropriate sizing. I take a multipronged approach.

White-to-white measurements serve as a starting point for straightforward, on-label cases and are a reliable method for surgeons newly incorporating phakic IOLs into their practices.

For anatomically borderline eyes or when the desired IOL size falls between options, I turn to ultrasound biomicroscopy and the nomogram, which account for sulcus-to-sulcus distance and lens rise. For example, when choosing between a 12- and 12.6-mm lens, ultrasound biomicroscopy often provides the

decisive input. For patients with an anterior chamber depth of less than 3 mm—potentially an off-label indication—I confirm anatomic suitability with meticulous imaging.

Recently, I have begun using AI-based sizing platforms such as the ICL Guru (RevAI), which can increase precision, particularly in off-label scenarios. The development of AI tools reflects a broader shift toward individualized, data-informed refractive care.

VAULT MANAGEMENT

My targeted vault range is 250 to 750 μm , although I have observed safe outcomes outside that window in certain situations:

- **Low vault (< 50 μm).** I typically consider lens explantation or exchange, especially if the phakic IOL implant is a toric model with notable rotation.
- **High vault.** Management depends on the anterior chamber angle. If Scheimpflug imaging shows an angle greater than 15°, I generally exchange the lens to reduce the risk of angle closure. A stable angle, however, may warrant observation.

FOR MY REFRACTIVE SURGERY COLLEAGUES

If you are not yet offering phakic IOLs, consider integrating them not as a replacement for LASIK or refractive lens exchange but as a complementary strategy. The surgical technique is approachable, especially in standard situations, and outcomes are highly consistent with thoughtful surgical planning.

Contemporary lens designs and sophisticated sizing tools have made the barrier to entry lower than ever. Those of you willing to invest the time can avail yourselves of abundant resources and mentorship opportunities to support your transition.

The goal is preparedness, not perfection. Knowing when to monitor the patient rather than intervene is central to safe practice.

UNMET NEEDS AND THE ROAD AHEAD

Advances in phakic IOL technology notwithstanding, opportunities for refinement remain. Expanded dioptric ranges at both extremes and a wider range of cylinder powers (beyond the current 1.00–4.00 D window) are high on my wish list.

The concept of presbyopia-correcting phakic IOLs is also attractive. What if it were possible to offer a 25-year-old

patient a phakic lens to correct their myopia and astigmatism now and it could be upgraded for presbyopia correction later before they require cataract surgery? A lifecycle approach to refractive care is on the horizon, and phakic IOLs could be central to that continuum. ■

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