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Presbyopia & Toric IOL Correction:

Keys to Success with Multifocal & EDOF IOLs

Trends in Presbyopia and Astigmatism Correction: 2018 ESCRS Clinical Survey Results

By Oliver Findl MD

The fourth annual ESCRS Clinical Survey revealed some interesting trends about the use of multifocal, toric, and extended depth of focus (EDOF) intraocular lenses (IOLs) for the correction of presbyopia. For instance, while only 11% of current cataract procedures among responding surgeons included presbyopia-correcting IOLs, almost three times as many – 30% – use monovision or mini-monovision as an alternative.

When asked how satisfied their patients are with monovision vs presbyopia-correcting IOLs one year postoperatively, surgeons reported that patient satisfaction for near, intermediate and distance vision is higher in presbyopia-correcting IOL patients – especially for intermediate, but even more so for near vision.

Participants were asked to identify the lowest amount of postoperative residual cylinder error they consider to be visually significant in patients implanted with bifocal/trifocal or EDOF IOLs. The responses suggest that EDOF IOLs are believed to accept higher levels of cylinder error, especially for higher amounts of astigmatism in the range of 0.75D to more than 1.0D (Figure 1).

> **Over time the number of ESCRS delegates finding 10 degrees or more of rotational error acceptable has significantly decreased**

The cost to patients and concerns over contrast visual acuity and nighttime quality of vision are the main reasons for not performing more presbyopia-correcting IOL procedures. Trifocal and EDOF IOL patients are believed to have over three times the chance of having significant aberrations at night even if the patient has no residual refractive error and a healthy ocular surface. Respondents said they believed just 5% of monovision patients would have significant aberrations at night, while

In patients implanted with a bifocal/trifocal or an EDOF IOL, what is the lowest amount of postoperative residual CYLINDER error that is considered to be visually significant in DIOPTRES?

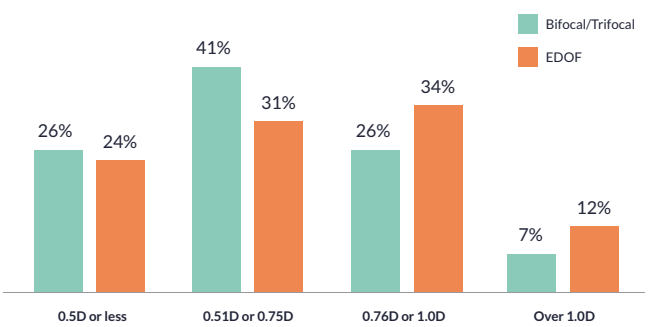


Figure 1: EDOF IOLs are believed to accept higher levels of cylinder error

After implanting a toric IOL, how many DEGREES of postoperative rotational error is acceptable before visual quality and degradation of visual acuity are significantly affected? ANSWER: 10 OR MORE DEGREES

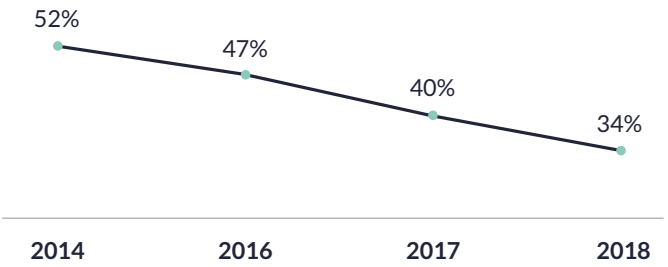


Figure 2: Over time the number of ESCRS delegates finding 10 degrees or more of rotational error acceptable significantly decreased

19% of trifocal and 16% of EDOF IOL patients would have these visual disturbances.

Toric IOL cost considerations play a significant role in IOL choice. Just 13% of respondents' current cataract procedures involve toric IOLs, but if cost were not an issue, they would choose toric IOLs for 61% of cataract patients who have significant astigmatism.

ESCRS delegates were asked what their most common procedure to manage astigmatism in monofocal cataract patients with 0.75D, 1.25D and 1.75D of cylinder, and their responses indicate that for higher astigmatism, toric lenses are the top choice, but for lower amounts of astigmatism, on-axis incision seems to be an alternative.

The survey revealed that a third of delegates believe that 10 or more degrees of rotational error is acceptable in patients who receive a toric IOL, before visual quality and degradation of visual acuity are

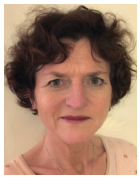
> **EDOF IOLs are believed to accept higher levels of cylinder error**

significantly affected. Nearly 50% say 5-to-9 degrees of rotational error is acceptable, and just 18% said less than 5 degrees is acceptable. Over the past four years, the number of ESCRS delegates finding 10 degrees or more of rotational error acceptable has significantly decreased, from 52% in 2014 to 34% in 2018 (Figure 2).

Oliver Findl MD *is chief of the Department of Ophthalmology, Vienna Hanusch Hospital, and founder of the Vienna Institute for Research in Ocular Surgery, Austria.*

E-mail: *oliver@findl.at*

Financial disclosures: *Dr Findl is a scientific adviser to Alcon, ZEISS and Johnson & Johnson Vision.*



Refractive IOLs: Importance of Patient Selection and Realistic Expectations

By Béatrice Cochener-Lamard MD, PhD

Thanks to surgical progress and better understanding and control of optics that make toric, multifocal and extended depth of focus (EDOF) intraocular lenses (IOLs) possible, ammetropia and spectacle independence can be targeted in select cataract patients. Careful patient selection and clear communication regarding realistic expectations are the keys to success with refractive IOLs (RIOLs).

There are two scenarios in which RIOLs are indicated. The first one is refractive lens exchange, where presbyopia patients seek an intraocular solution to spectacle independence. The benefit-to-risk ratio is best in the case of patients who are over 55 years old when LASIK and monovision are inadequate solutions because of insufficient results for near vision and early loss of crystalline transparency, which can be graded nowadays by densitometry or scatter light diffusion changes evaluation.

The second scenario in which RIOLs are indicated is in the case of true cataract patients. Traditional monofocal cataract surgery would simply enable these patients to recover lost visual acuity. With RIOLs, we can do better, especially with the use of toric IOLs that correct corneal astigmatism as spectacles do. We can even achieve complete spectacle independence, with the use of EDOF or multifocal IOLs, if there are no ocular or systemic contraindications.

When patients are amenable to this option, it is vital to educate them about the surgery and what they can expect from it, and it is critical to obtain their informed consent. This process is time consuming: You must explain what presbyopia is, manage expectations, perform the surgery, including astigmatism correction, and ensure that they fully comprehend the advantages and limitations of all steps throughout the process,[1] including the risk of not being able to use the selected IOL in case of surgical complication.

PATIENT SELECTION

When choosing candidates for RIOLs, it is important to rule out those who have unreasonable expectations. These patients must understand that they should not expect perfect vision at all distances in all conditions because of the potential impact on quality of vision. It is also important to rule out candidates whose profession entails specific vision requirements, such as a nightshift ambulance driver.

Furthermore, we must eliminate any candidates who have ocular progressive diseases, such as glaucoma, maculopathy, or corneal disturbances. We must also take into consideration any disturbances in binocular vision, as well as any progressive systemic disease, such as diabetes or auto-immune disease.

Other factors that should raise a red flag include a personal or family history of keratoconus and age-related macular degeneration. It is also recommended to exclude patients who are younger than 55 and have a lens longer than 24mm, except in the case of traumatic or unilateral congenital cataract, because their risk of retinal complications is higher.

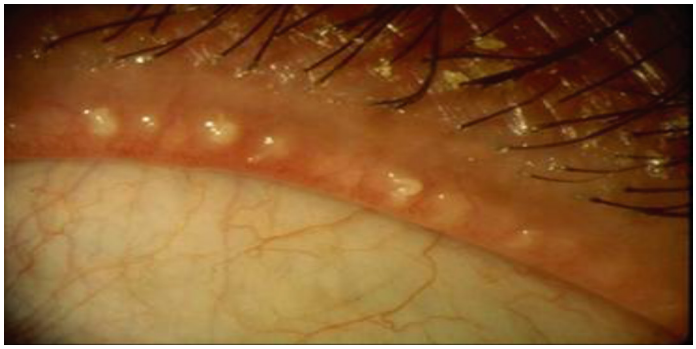


Figure 3: Dry eye disease, such as meibomian gland dysfunction, seen here, is underestimated in the presbyopic IOL patient population

<55 years early cataract, high hyperopia	<55 years RLE	<70 years
• Corneal strategies - PresbyLASIK • Monovision • Multifocal IOL • EDOF IOL	• If no contraindication (ocular, systemic, psychological) • Multifocal IOL ± toric • If special need for night vision - EDOF IOL	• If no contraindication (ocular, systemic, psychological and patient demand) - EDOF IOL - Piggyback Multifocal IOL

Figure 4: Refractive IOL decision tree helps identify which presbyopic IOL is best for each patient

> **When choosing candidates for RIOLs, it is important to rule out those who have unreasonable expectations**

KEY VALUATION PARAMETERS

When evaluating a patient for RIOL surgery, consider their visual function, near and far visual acuities, as well as intermediate vision from 60-to-80cm. Also factor in refraction and binocular vision and oculomotricity, especially in case of amblyopia and hyperopia.

It is particularly important to examine the ocular surface for potential dry eye disease (DED), which is present in 50% of cataract cases (Figure 3). The prevalence of DED increases with age, so it is particularly critical in this patient population to evaluate the lipid layer for blepharitis and meibomian gland dysfunction. A successful surgical outcome is dependent on identifying and treating DED prior to surgery.

Patients must understand that no RIOL will enable them to return to the vision that they had in their 20s: There is a neuroadaptation process that takes anywhere from two weeks up to a few months; there is an impact on quality of vision, especially at night; and visual performance will depend on light conditions.

With respect to RIOL choice, I recommend this decision tree (Figure 4). When the patient is below age 55, I lean toward a corneal correction approach with presbyLASIK, and monovision is still efficient in myopia. Above that age, there is a place for refractive lens exchange with presbyopic IOLs, if inclusion criteria are respected. EDOF IOLs may best serve true cataract patients, over 70 years of age, who are interested in reduced spectacle dependence because they are more forgiving on remaining refractive error and less demanding in vision quality.

CONCLUSION

Incorrect candidate selection, imperfect measurements and insufficient patient information can result in RIOL surgery failure. Even if intraocular solutions for presbyopic correction appear to be a more predictable, more stable, and faster way than any corneal approach to correction, it is important not to offer this option too early. It is vital to select patients who are motivated and have reasonable expectations, who understand the compromises involved in RIOLs and who aren't looking for vision perfection. It is important to discuss with them issues such as neuroadaptation and visual function issues related to light conditions.

REFERENCES

1. Buznego C, Trattler WB. Presbyopia-correcting intraocular lenses. *Curr Opin Ophthalmol.* 2009;20:13–8.

Béatrice Cochener-Lamard MD, PhD, *is Head of the Ophthalmology Department at the University Hospital of Brest, Brest, France.*

E-mail: *beatrice.cochener-lamard@chu-brest.fr*

Financial disclosures: *Dr Cochener-Lamard is a clinical investigator and consultant for Alcon, Allergan, Cutting Edge, Dompe, Johnson & Johnson Vision, Physiol, Santen, Théa and ZEISS.*

Keys to Success with Toric IOLs

By Douglas D. Koch MD

Toric IOLs are clearly underutilised, with only 13% of participants in last year's ESCRS Clinical Survey acknowledging use of them for surgical presbyopia correction. If you keep the following tips in mind, you can optimise outcomes with premium IOLs and help your patients achieve the spectacle independence and clear vision they want.

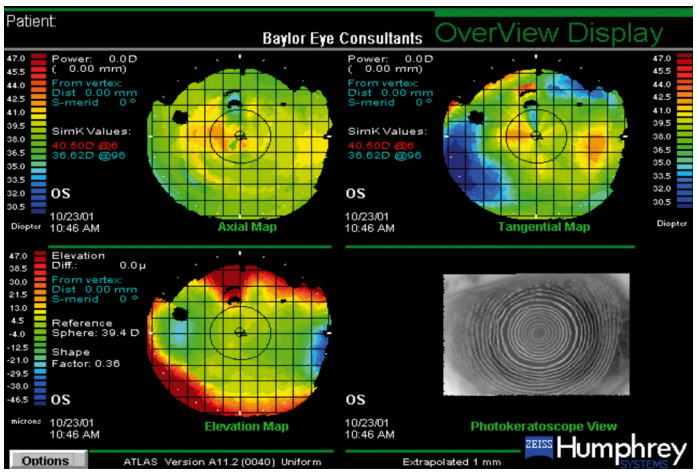
First, keep in mind that the threshold for correcting astigmatism is very low. My target is less than 0.5D of total corneal astigmatism, so precision in all steps is critical. One study by Hayashi looked at subjects implanted with a +3.0D add multifocal IOL and then introduced 0.5D of astigmatism. Uncorrected distance vision dropped from 20/20 to 20/30, which is significant.[1]

Next, let's consider use of technology. I use biometers that have light-emitting diodes for identifying power and meridian. Topography is also essential. Refraction sometimes provides a clue about the magnitude and meridian of astigmatism. If the refraction differs significantly from your other measurements, it may indicate something about the posterior cornea or lens tilt. Most importantly, you must validate your data.

Another key to successful use of toric IOLs is understanding your surgically induced astigmatism (SIA). It will likely be minimal with a temporal 2.2-to-2.4mm incision, but it is often higher with superior or larger incisions. SIA with a temporal incision is low, but the scatter is large and that will play into postoperative results. If you are uncertain about your SIA or use superior incisions, I recommend that you determine it using a calculator, such as the one Warren Hill MD has on his website: *http://www.doctor-hill.com.*

It is important to rule out irregular astigmatism (Figures 5 and 6). This is where topography becomes so important. I prefer Placido imaging; it is reliable and given that irregular astigmatism causes poor outcomes, I consider this technology a must-have in my practice. Placido mires are a great way to validate surface quality and rule out conditions such as anterior basement membrane disease, subepithelial scarring and visually significant dry eye. All of these can be treated, but be sure to validate surface quality post-treatment. I often find that, even with complete removal of surface pathology such as Salzmann's or anterior basement membrane dystrophy, the cornea is no longer pristine, and these patients may no longer qualify for a multifocal IOL. In addition, topography is required to rule out ectatic disorders that would disqualify these corneas for postoperative enhancement.

It is essential to validate your biometric data, especially corneal measurements. I always take more than one measurement, either with two different devices or the same device. You can validate your data qualitatively. We look at the LED mires of every patient and remeasure and treat as necessary to get perfect mires, which will give optimal measurements.



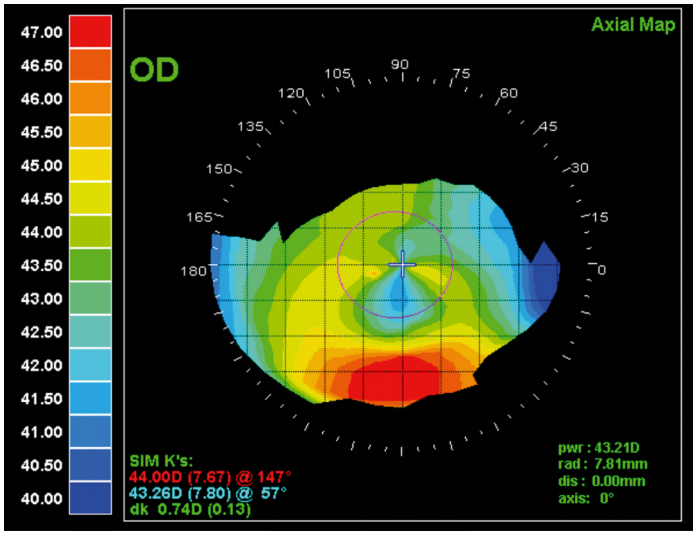


Figure 5 and 6: Topography maps illustrate the importance of ruling out irregular astigmatism in toric IOL candidates

Another key to successful toric IOL use is factoring in the posterior cornea. You can use regression formulas that are based on population averages, or you can measure with one of the many technologies that are available. The problem with regression approaches for selecting toric IOLs is that individual variability will sometimes reduce the accuracy of your outcomes. However, although direct measurement technology

is improving, reported outcomes with posterior corneal measurement are at best only marginally superior to regression approaches. So, using lens manufacturer formulas, such as the Barrett, or the Abulafia-Koch, is just as good as direct measurement at this time.

Another key element is recognising that correct alignment is more critical in multifocal eyes. Just 10 degrees of misalignment equates to greater than 33% under correction. I try to target alignment within 5 degrees, but certainly less than 10 degrees.

When it comes to post-LASIK/PRK eyes, toric IOLs are reasonable if these criteria are met: 1) regular bow-tie astigmatism within the central 3mm zone; 2) the difference in astigmatism magnitude between the two biometers we use, IOLMaster and Lenstar, is ≤0.75D; and 3) the alignment of the steep meridian of the two devices is within 15 degrees. (Presumably, one could substitute other devices for the two biometers we use.) When these criteria are met, we have found accuracy within 0.5D of a target of 80% or greater.

Toric IOLs in keratoconic and post-RK eyes are even more challenging due to the greater amount of irregular astigmatism. We use toric IOLs in these patients if the cornea is demonstrably stable, the astigmatism in a central 3mm is fairly regular, the patient has indicated that he or she does not want to wear contact lenses postoperatively and the astigmatic correction in their glasses pre-cataract surgery is similar to the corneal astigmatism and gave them good vision.

Finally, be aware of the potential for astigmatism due to IOL tilt. Given all of these possible sources of error, you must listen to your patient's visual complaints postoperatively and respond proactively. Don't be satisfied with subpar vision. Be ready to address postoperative spherical and astigmatic errors as necessary to maximise your patients' vision and enjoyment of their pseudophakic vision.

> **Another key to successful use of toric IOLs is understanding your surgically-induced astigmatism**

Douglas D. Koch MD *is Professor and Allen, Mosbacher, and Law Chair in Ophthalmology at Cullen Eye Institute, Baylor College of Medicine in Houston, Texas.*

Email: *dkoch@bcm.tmc.edu*

Financial disclosures: *Dr Koch is a consultant for Alcon, CAPSULaser, ZEISS, Ivantis, Johnson & Johnson Vision, PerfectLens and Vivior.*

REFERENCE

1. Hayashi et al. Effect of astigmatism on visual acuity in eyes with a diffractive multifocal intraocular lens. *JCRS 2010*; 36:1323-9.

Strategies for Maximising Outcomes with EDOF IOLs

By Francesco Carones, MD

Extended depth of focus (EDOF) lenses differ from other IOLs in the way the focal points are generated. Any lens generating a single and distinct focal point is called monofocal. Lenses generating more than a single and distinct focal point are called multifocal, such as bifocal with two focal points and trifocal with three focal points. They can be diffractive or refractive. Lenses generating a longitudinally elongated focus are known as EDOF IOLs, and they can be diffractive, refractive, or aperture optics (Figure 7).

The rationale for EDOF IOLs is trying to get as much spectacle independence and multifocality as possible out of a lens, while minimising the quality of vision compromises and night vision symptoms that are associated with multifocal lenses.

The first EDOF IOL introduced to the market was the Symfony IOL (Johnson & Johnson Vision). The echelette diffractive pattern does exactly what is intended: it stretches the focal point enough to allow about 1.0D of useful intermediate vision compared to monofocal IOLs. This design provides some spectacle independence both at intermediate and near, as well as under bright light conditions. This technology is still associated with dysphotopsia, especially when pupils are dilated,

> **This technology is still associated with dysphotopsia, especially when pupils are dilated**

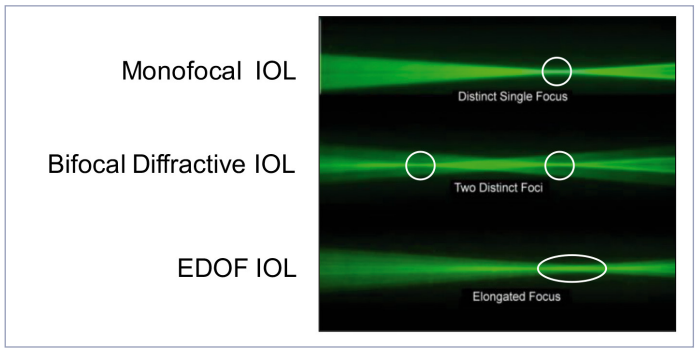


Figure 7: Extended depth of focus lenses differ from other IOLs in the way the focal points are generated

but there are fewer reports regarding severe night vision problems compared to trifocal technology.

Another EDOF lens that is available is the MiniWell IOL (SiFi), which obtains its extension of the depth of focus through a combination of positive and negative spherical aberration to provide reduced spectacle dependence and improved night vision. Another contender, the AT LARA IOL (ZEISS), is a diffractive trifocal EDOF-like IOL. Trifocal IOLs are known for greater spectacle independence and better unaided near vision; EDOF IOLs are associated with higher quality of vision, better contrast sensitivity, less dysphotopsia and more forgiveness.

What do we know clinically about EDOF in comparison to trifocals? I evaluated a series of my patients with a 14-point questionnaire. From their responses, it was determined that EDOF delivers less spectacle

> **Aberrometry is useful to measure the IOL technology's capabilities for the purpose of quality of vision comparison**

independence than trifocal IOLs, but better quality of vision and higher contrast sensitivity. We also learned that there is room for improvement in EDOF IOLs, such as in the possibility of them delivering more intermediate and near vision and perhaps also being less dependent on light in terms of what they deliver.

PRACTICE TIPS

How can we get patients who receive this EDOF technology performing better? One of the most commonly used methods is mini- or micro-monovision. I prefer the micro-monovision because it provides a better uncorrected quality of vision, and distance visual acuity at intermediate and near without significantly compromising stereopsis. The concept of micro-monovision is having the non-dominant eye set at -0.5D, which relates to an extension of the depth of focus, giving the patient the ability to read at a distance of about 45-to-50 cm, thus optimising their potential for spectacle independence. This strategy delivers a good range of vision and maintains stereopsis.

Another possibility is mixing technologies. For instance, a trifocal IOL in one eye and an EDOF in the fellow eye results in defocus curves that bring the two eyes right on spot in that area where you can maximise the efficiency for spectacle independence using both eyes.

The third way that I would consider, is hybrid EDOF/trifocal technology, which might perfect the extension of the focus from the EDOF. For instance, the Synergy IOL (Johnson & Johnson Vision) has a profile that can merge the traditional diffractive and echelette technologies, thus extending the range of focus further down the myopic side (Figure 8).

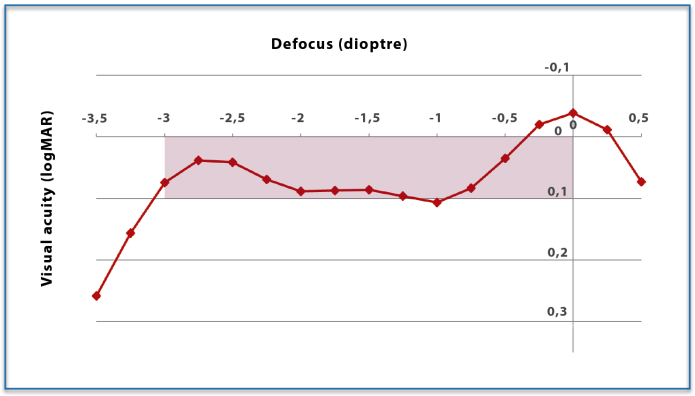


Figure 8: The Synergy IOL design combines traditional diffractive and echelette technologies

Aberrometry is useful to measure the IOL technology's capabilities for the purpose of quality of vision comparison. For instance, when looking at the Symfony and Synergy IOLs, you see that the Synergy is more like the central part of the Symfony, where the peripheral part is more dedicated for distance and near.

I only have limited experience with this new Synergy technology, but my preliminary results suggest that even in a short series of patients with a short follow-up, it looks like something promising that you may want to consider.

The three ways we have for optimising results with EDOF IOLs are related to using micro-monovision, mixing technology or using hybrid technologies, with the hopes that industry will support our efforts to integrate EDOF IOLs into a wider range of patients so we can give more of our patients spectacle independence.

Francesco Carones MD *is Medical Director and Physician CEO of Carones Vision, Milan, Italy.*

E-mail: *fcarones@carones.com*

Financial disclosures: *Dr Carones is a consultant for Alcon, ZEISS, CSO and Johnson & Johnson Vision.*

Maximising Outcomes with Trifocal IOLs

By Thomas Kohnen, MD, PhD, FEBO

Trifocal IOLs offer high patient satisfaction and a better chance of spectacle independence than is likely with other types of refractive lenses. In order to optimise our outcomes with these lenses, we must optimise the ocular surface, achieve emmetropia, centre the lens and avoid intraoperative complications.

With trifocal IOLs, light is distributed to multiple foci to achieve far, intermediate and near vision (Figure 9). The newest trifocal IOL on the market in Europe is the Acriva Trinova (VSY Biotechnology), which utilises Sinusoidal Vision Technology to achieve outstanding visual outcomes in mesopic conditions, with 92% effective light transmission. It is designed with 12 stepless diffractive zones, which offers better contrast sensitivity. The aim of the design is to reduce halos and scattered light. Overlapping diffractive pattern trifocal IOLs cause significant light

> **Preoperative evaluations are more important than ever with toric presbyopia IOLs**

loss. Every single percentage of light loss affects patients' overall visual performance exponentially. The Acriva Trinova lens ensures maximum light transfer as a result of its stepless diffractive zones. The higher the light transmission, the better the contrast sensitivity.

The trifocal IOLs that preceded the Acriva include the FineVision (PhysIOL), AT LISA tri (ZEISS), PanOptix (Alcon) and RayOne Trifocal (Rayner). The RayOne trifocal IOL, which is actually derived from bifocal technology, has 16 diffractive steps and a 4.5mm diffractive zone. It was developed to be less dependent on pupil size or lighting conditions, and it improves distance vision in mesopic conditions. This can also be used as an add-on to a monofocal lens in a procedure similar to the piggyback IOL paradigm, where you put the trifocal lens into the sulcus where an IOL has already been implanted. This way we can use trifocality – and maybe even in the future EDOF technology – on top of our older monofocal lenses.

CLINICAL STUDIES

We have done several studies of the available trifocal IOLs. For instance, a prospective, non-randomised, non-comparative case series of 27 patients undergoing implantation of AT LISA trifocal or toric, revealed that patients were very happy with their outcomes overall[1]. Contrast sensitivity was within normal range in photopic, mesopic and mesopic with glare conditions. Despite some optical phenomena, patients had high spectacle independence three months postoperatively; 92% of patients said they would choose the same IOL again.

> **With trifocal IOLs, light is distributed to multiple foci to achieve far, intermediate and near vision**

In a study of the PanOptix trifocal with a quadrifocal design, where 27 patients received bilateral implantation, we had similar results.[2] Visual performance of this IOL showed good visual acuity at all distances, with best VA at 60cm, and high patient satisfaction and spectacle independence three months postoperatively. We also found some optical disturbances, but overall the patients were happy.

We compared the AT LISA trifocal and the PanOptix panfocal IOLs in a recently published study.[3] The prospective, non-randomised comparative case series of 20 subjects undergoing bilateral implantation of PanOptix panfocal or AT LISA trifocal revealed that with respect to monocular visual performance, there was no significant difference between the IOLs at far, intermediate or near distance. However, there was better visual acuity at 50cm and 66cm with the panfocal IOL. The main difference was in the defocus curve, with a bit of an advantage at 60cm for the panfocal lens.

IDEAL CANDIDATES AND PEARLS

The ideal trifocal IOL candidate is a patient who wants spectacle independence and good vision at all distances; someone with no pathology on the cornea, no pathology on the retina, no irregular astigmatism. Patients who are contraindicated to this technology are those who have severe dry eye disease, pseudoexfoliation, glaucoma, and/or severe retinal disease.

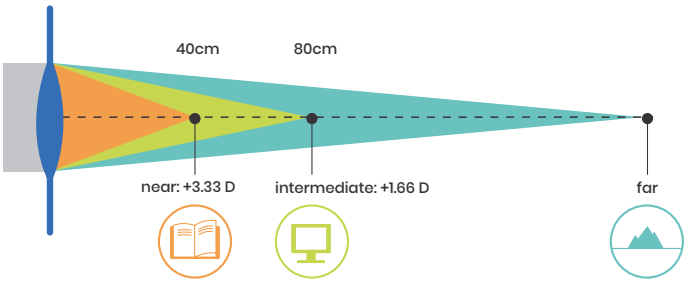


Figure 9: With trifocal IOLs, light is distributed to multiple foci to achieve far, intermediate, and near vision

Keys for Maximising Outcomes with Trifocal IOLs

- Preoperative optimisation of ocular surface
- Achieving emmetropia
- Correction of astigmatism
- Correction of misaligned or dislocated toric IOL
- Effect of manual capsulorhexis size and IOL position
- Intraocular complications (posterior capsular rupture)

Figure 10: Essential considerations for maximizing patient outcomes with trifocal IOLs

Preoperative evaluations are more important than ever with toric presbyopia IOLs. Tomography, endothelial cell counts, macular function, exclusion of keratitis sicca are all critical to successful outcomes and satisfied patients. With respect to postoperative refraction, in most of these eyes we need to achieve emmetropia. With so many new IOL calculation formulas available, you must be sure that the one you use with these IOLs is up to date. Equally important is the need for precise IOL centration, and a carefully created capsulorhexis or capsulotomy. These lenses will not function appropriately if they are decentered upon placement or if they decenter over time. Some of my key pearls are summarised in Figure 10.

Preoperative optimisation of the ocular surface is also critical. An expansive literature review of 16 papers confirms that an impaired ocular surface affects preoperative planning for cataract surgery, including IOL calculations, toric IOL axis and magnitude estimates, keratometry and topography measurements; and also increases surgical difficulty.[4] Surgeons should recognise and aggressively pre-treat cataract patients who have pre-existing dry eye disease.

One of the final points that must be made is that the effect of astigmatism is often underestimated. Make sure you don't leave patients with 1.5D of astigmatism – particularly multifocal IOL patients. We think 0.5D should be the highest amount of astigmatism that can remain and still leave a patient enjoying the benefits of multifocality.

***Thomas Kohnen MD, PhD, FEBO**, is Professor and chairman, Department of Ophthalmology, at Goethe University, Frankfurt, Germany.*

***E-mail:** kohnen@em.uni-frankfurt.de*

***Financial disclosures:** Dr Kohnen is a consultant and does research for Alcon, Novartis and ZEISS.*

REFERENCES:

1. Kohnen T, Titke C, Böhm M. Trifocal intraocular lens implantation to treat visual demands in various distances following lens removal. *Am J Ophthalmol 2016*; 161:71–77.
2. Kohnen T, Herzog M, Hemkeppler E, Schönbrunn S, De Lorenzo N, Petermann K, Böhm M. Visual performance of a quadrifocal (trifocal) intraocular lens following removal of the crystalline lens. *Am J Ophthalmol 2017*; 184:52–62.
3. Böhm M, Hemkeppler E, Herzog M, Schönbrunn S, de'Lorenzo N, Petermann K, Kohnen T. Comparison of a panfocal and trifocal diffractive intraocular lens after femtosecond laser-assisted lens surgery. *J Cataract Refract Surg.* 2018; 44:1454-1462.
4. Chuang J, Shih KC, Chan TC, Wan KH, Jhanji V, Tong L. Preoperative optimization of ocular surface disease before cataract surgery. *J Cataract Refract Surg.* 2017;43(12):1596-1607.

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