

A phase shift in lens technology

Built on
clinical data

LIBERTY[®]

ELON



MEDICENTUR

Material. Design. Optics.



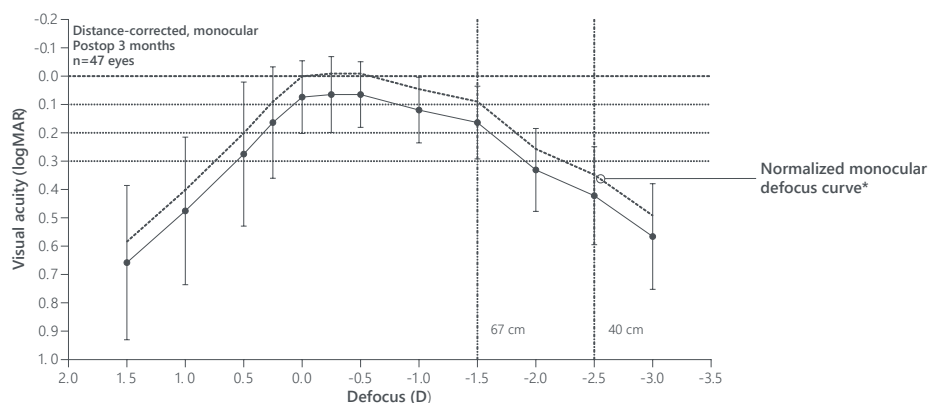
Technical characteristics

- Hydrophobic material, RI = 1.47, ABBE = 58
- Central EDOF zone utilizing Wavefront Linking Technology™
- 13 mm overall diameter, 6 mm optic diameter
- Bi-Flex™ haptics, 360° sharp edge around the optic



Highlights of clinical findings

- ELON belongs to the Partial Range of Field extended functional classification category, providing 1.7 D useful defocus above 0.2 logMAR. [1]



* Visual acuity at infinity is 0.0 logMAR [1-3] to properly determine the functional class of ELON

- ELON consistently provides high contrast sensitivity. [1]
- ELON achieves outstanding visual acuities at far, intermediate and near distances. [2]

Monocular (decimal)

• UDVA	0.94 ± 0.26	• CDVA	1.05 ± 0.20
• UIVA	0.79 ± 0.17	• DCIVA	0.82 ± 0.18
• UNVA	0.60 ± 0.17	• DCNVA	0.58 ± 0.15

Binocular (decimal)

• UDVA	1.11 ± 0.33	• CDVA	1.19 ± 0.22
• UIVA	0.90 ± 0.19	• DCIVA	0.88 ± 0.22
• UNVA	0.69 ± 0.14	• DCNVA	0.65 ± 0.17

- ELON provides low level of visual disturbance based on Light Distortion Index. [3]
 - Monocular, distance corrected: 9.07%
 - Binocular, no correction: 7.27%
- ELON delivers stable and predictable refractive outcomes. [3]
 - 91% of eyes ≤ 0.5 D SEQ



Peer-reviewed publications

1 Assessing the clinical outcomes of a novel EDOF intraocular lens: a functional classification approach

Györy JF, Németh G, Pesztenlehrer N. Assessing the clinical outcomes of a novel EDOF intraocular lens: a functional classification approach. *BMC Ophthalmol.* 2025 May 16;25(1):293. doi: 10.1186/s12886-025-04114-8. PMID: 40380189; PMCID: PMC12082911.

Number of patients / eyes and duration

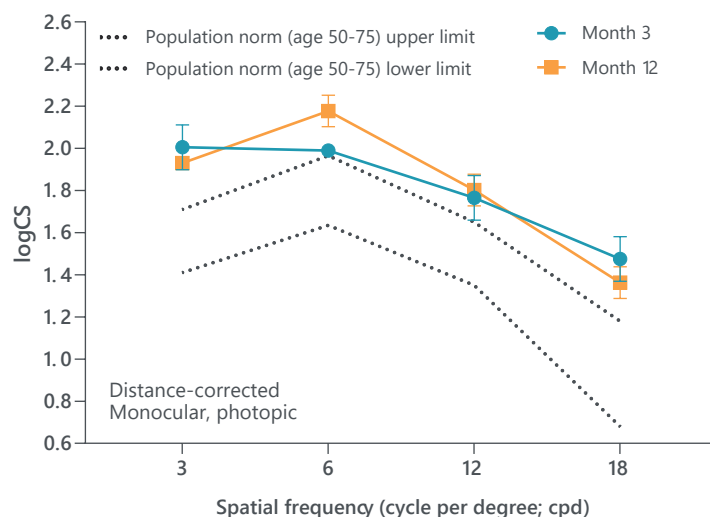
29
patients

58
eyes

12
months

Results

- Defocus range better than 0.2 logMAR threshold on the normalized monocular distance-corrected defocus curve was 1.7 D, which meets the criteria for **Partial Range of Field extended** category
- According to the binocular depth of focus the functional visual acuity ($VA \leq 0.3$ logMAR) spanned from approximately 1.00 D to -2.50 D
- At 12 months, the binocular **UIVA and UNVA** values were 0.14 ± 0.12 logMAR and 0.19 ± 0.20 logMAR, respectively
- **Contrast sensitivity** values at both 3 and 12 months were over the population norm
- Regarding photic phenomena, **90% and 87.5%** of patients experienced **no to moderate rates of glare and halos**, respectively



Conclusions

- Based on the results, the ELON IOL can be classified as a Partial Range of Field *extended* lens, providing evidence on the true EDOF performance claim.
- Vast majority of patients did not experience bothersome dysphotopsia at all, and their contrast sensitivity improved compared to patients aged 50-75 years old.

2 Visual quality and symptomatology following implantation of a non-diffractive extended depth-of-focus intraocular lens

Cano-Ortiz, A.; Sánchez-Ventosa, Á.; González-Cruces, T.; Villalba-González, M.; Aguilar-Salazar, F.J.; Prados-Carmona, J.J.; Carpena-Torres, C.; Carracedo, G.; Villarrubia, A. Visual Quality and Symptomatology Following Implantation of a Non-Diffractive Extended Depth-of-Focus Intraocular Lens. *J. Clin. Med.* 2025, 14, 4460. <https://doi.org/10.3390/jcm14134460>

Number of patients / eyes and duration

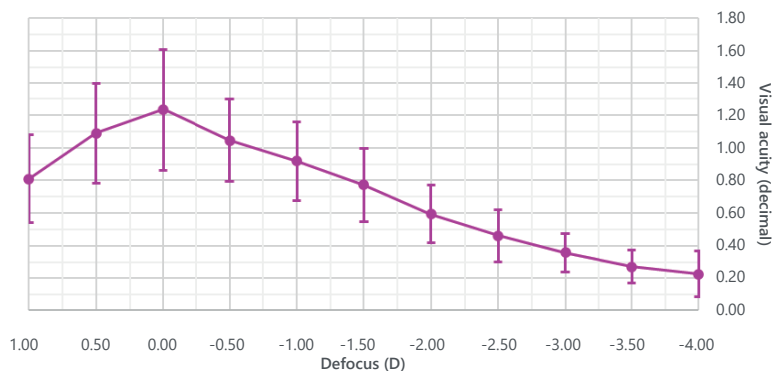
28
patients

56
eyes

3
months

Results

- Mean uncorrected **monocular distance, intermediate and near** visual acuities were **0.02, 0.10 and 0.22 logMAR**, respectively
- Mean uncorrected **binocular distance, intermediate and near** visual acuities were **-0.05, 0.05 and 0.16 logMAR**, respectively
- Based on the **binocular VADC**, the useful depth of focus over 0.2 logMAR threshold was 1.75 D, while over 0.3 logMAR this value was 2.3 D
- Refractive outcomes were slightly inferior, however the **visual acuities** turned out to be **excellent**



Conclusions

- ELON provided satisfactory visual quality at all distances, comparable to other Partial Range of Field lenses in the literature.

3 One-year outcomes after implantation of an extended depth of focus intraocular lens in cataract patients

Fernández J, Burguera N, Rodríguez-Calvo-de-Mora M, Rocha-de-Lossada C, Rodríguez-Vallejo M. One-Year Outcomes after implantation of an Extended Depth of Focus Intraocular Lens in Cataract patients. *J Cataract Refract Surg.* 2025 Jul 11. doi: 10.1097/j.jcrs.0000000000001737. Epub ahead of print. PMID: 40643678.

Number of patients and duration

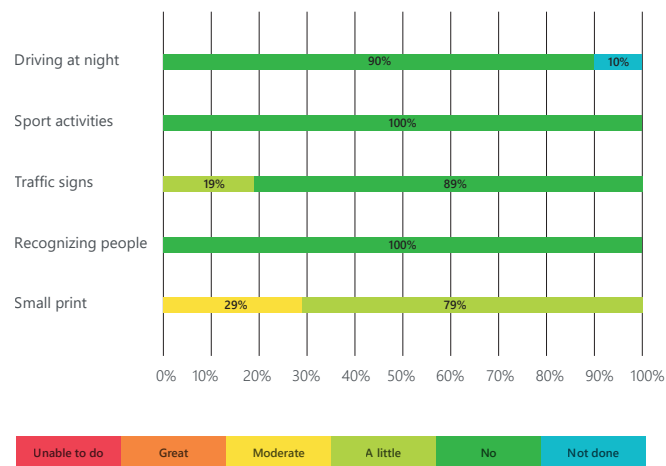
36
patients
at 3-month
follow up

23
patients
at 12-month
follow up

Results

- Mean **monocular distance-corrected VAs** at 3 months were **0.01, 0.11 and 0.29 logMAR** for far, intermediate and near, respectively
- The **95% confidence interval for DCIVA** was between **0.08 and 0.15 logMAR**
- **Photopic pupil diameter of 3 mm or less** (measured by Pentacam with 120 lux environmental illumination) strongly corresponded with enhanced **near vision, reaching 0.20 logMAR or better** on average
- 91% of eyes achieved refractive outcomes below 0.5 D SEQ
- **Visual acuity remained stable** at different follow-ups, and patient reported **outcomes improved over time**

21 patients at 12 months VF-14 Questions (extract)



Conclusions

- ELON provided excellent far and intermediate visual acuities, while the near visual performance was pupil-dependent.
- Positive dysphotopsia was greatly reduced compared to trifocal IOLs based on the LDI and patient-reported outcomes.
- ELON demonstrated that it belongs to the *extended* Partial Range of Field IOL functional category.

Testimonies from Key Evidence Leaders



Prof. Sathish Srinivasan

„I have been using *ELON* lenses for my patients since 2022. The high ABBE number and lower refractive index of these lenses provide excellent quality of unaided distance and intermediate vision. The Bi-flex haptic design offers great rotational stability for the toric lenses. This IOL has become the first choice in my practice for patients seeking good unaided distance and intermediate vision.“



Joaquín Fernández

“*Liberty* feels like an all-terrain lens, designed to confidently cover every visual distance. In over 85% of implantations, patients achieve complete spectacle independence from far to near. For the small percentage who occasionally need glasses, it’s typically for highly demanding near tasks. What sets *Liberty* apart is its ability to provide a Smooth Full-Depth of Field while maintaining dysphotopsia levels comparable to refractive Extended Partial-Depth of Field lenses, only 7% of patients reported being bothered at 12 months. That balance makes it my lens of choice in the pursuit of total spectacle freedom.“



Prof. Banu Cosar

“The *Liberty* IOL offers my patients excellent visual outcomes across all distances. I consistently observe high levels of spectacle independence and patient satisfaction. Due to its low rate of dysphotopsia, it remains one of my go-to choices for active presbyopic patients.

The *ELON* IOL delivers excellent distance and intermediate vision, along with functional near vision. I frequently recommend it to patients who prioritize high-quality vision without dysphotopsia. Its optical design ensures a continuous range of focus while preserving contrast sensitivity and minimizing visual disturbances.“



Guadalupe Cervantes

“*Liberty* IOL provides excellent far, near and good intermediate vision to all my patients. With just 7 rings, the lens produces less dysphotopsias and higher contrast sensitivity.

Liberty’s stability and the square edges at 360° of its surface, diminished considerably the posterior capsule opacification.“



Alison Chiu

"I have a strong preference for the *ELON* IOL due to its exceptional material, design and optics, which deliver outstanding and reliable visual outcomes for my patients. This extended depth of focus IOL from Medicontur is a standout in my cataract and refractive practice, ensuring that patients experience enhanced distance clarity and continuous range of focus to intermediate, with true freedom from glasses when used in the suitable patient in a micro monovision configuration."



Mun Wai Lee

"The *ELON* has consistently delivered excellent outcomes for my patients. Bilateral implantation provides a smooth range of vision with minimal dysphotopias, making it an ideal choice for those seeking quality distance, intermediate and functional near vision. I have been very impressed with its performance and patient satisfaction."



Brian Harrisberg

"I have 40 years experience in ophthalmology and been a new adaptor of refractive technology. The closest solution to unaided all purpose vision is facilitated through premium lenses such as the diffractive multifocal implants. In my hands and for the last 8 years I can fully support the use of the *Liberty* lens which consistently reaches target and with very few unwanted side effects. I would definitely choose this lens for myself when I will require cataract removal."



Michael Assouline

"I have implanted more than 1500 *Liberty* IOL since 2012 in a series of some 6000+ multifocal lenses. This is still my favourite choice, which I have selected for my own parents, wife and many of my colleagues.

The unique smaller central diffractive zone and the reduced number of steps both limit drastically unwanted photic issues to non-significant levels while providing an outstanding distance performance for day and night vision. I have gained enough confidence to routinely expand my indications to more delicate cases, including mild forms of keratoconus, post RK / Lasik / Smile / PRK, post PKP / DALK/ DMEK, pseudo-exfoliation, and high myopia."



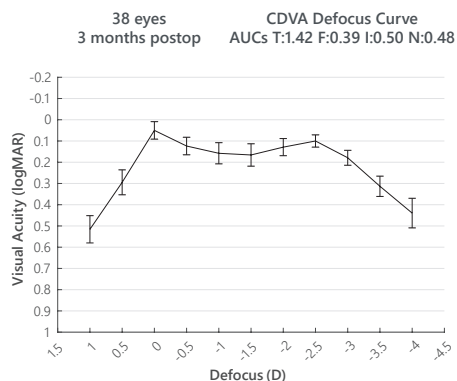
Technical characteristics

- Hydrophilic, RI = 1.47, ABBE = 58
- Central 3 mm diffractive zone with 7 apodized rings, leaving 75% of the optic purely refractive
- 13 mm overall diameter, 6 mm optic diameter
- Bi-Flex™ haptics, 360° sharp edge around the optic



Highlights of clinical findings

- The useful defocus range* above 0.2 logMAR is higher than 3 D, making Liberty an ideal choice for reaching spectacle independence. [4]



- Liberty offers outstanding visual outcomes at all distances, both mono- and binocularly. [4]

Monocular (logMAR)

• UDVA	0.07 ± 0.10	• CDVA	0.00 ± 0.06
• UIVA	0.08 ± 0.10	• DCIVA	0.08 ± 0.09
• UNVA	0.09 ± 0.08	• DCNVA	0.09 ± 0.08

Binocular (logMAR)

• UDVA	0.01 ± 0.07	• CDVA	-0.01 ± 0.06
• UIVA	0.02 ± 0.08	• DCIVA	0.02 ± 0.08
• UNVA	0.04 ± 0.08	• DCNVA	0.05 ± 0.08

- Liberty's contrast sensitivity both in photopic and mesopic conditions were exceptional. [5]
- Photic phenomena experienced with Liberty is close to ELON's. [7]
 - Monocular: 15.21%
- Liberty demonstrates stable and predictable refractive outcomes. [5]
 - 93.2% of eyes ≤ 0.5 D SEQ

*Q-Flex Trifocal is optically equivalent to Liberty.



Peer-reviewed publications

4

One-year follow-up of a multifocal intraocular lens with optimized elevated phase shift

Fernández J, Srinivasan S, Burguera N, Martínez J, Rodríguez-Vallejo M. One-year follow-up of a multifocal intraocular lens with optimized elevated phase shift. *J Cataract Refract Surg.* 2023 Oct 1;49(10):1018-1024. doi: 10.1097/j.jcrs.0000000000001266. PMID: 37464551.

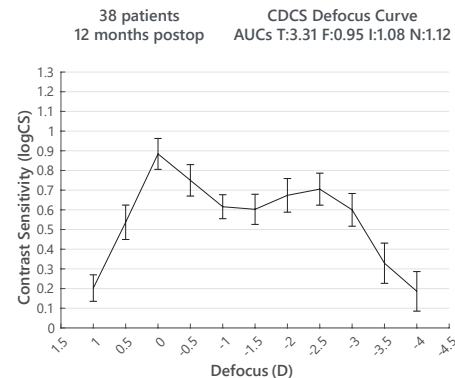
Number of patients and duration

47
patients

12
months

Results

- 80% of eyes achieved binocular UDVA of 0.00 logMAR, whereas 96% achieved UIVA and UNVA of 0.10 logMAR
- 74%, 79% and 77% of eyes in ± 0.375 D were obtained for Barrett, Evo and Kane with IOLMaster 500 data
- Photopic pupil did not influence monocular DCNVA and CDVA
- Patients with pupils below 2.5 mm achieved 0.00 logMAR monocular DCIVA
- 92.7% of patients reported no bothersome positive dysphotopsia



Conclusions

- The optimized (EPS 2.0) optical surface created a nearly monotonous decrease of VA from far to near.
- Spectacle independence was high while bothersome photic phenomena was rarely reported.

5 Long-term performance of a diffractive-refractive trifocal IOL with centralized diffractive rings: 5-year prospective clinical trial

Györy JF, Srinivasan S, Madár E, Balla L. Long-term performance of a diffractive-refractive trifocal IOL with centralized diffractive rings: 5-year prospective clinical trial. *J Cataract Refract Surg.* 2021 Oct 1;47(10):1258-1264. doi: 10.1097/j.jcrs.0000000000000670. PMID: 33974369.

Number of patients / eyes and duration

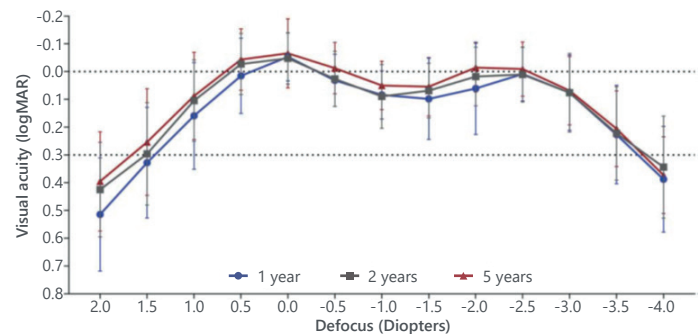
37
patients

74
eyes

5
years

Results

- **Uncorrected VAs reaching 0.0 logMAR** for far, intermediate and near distances were achieved in **66%, 67%** and **32%** of patients, respectively
- YAG capsulotomy rate was 0% by year one, 9% by year 2 and 21.9% by year 5
- There were **no statistically significant differences in defocus curves** taken at 1, 2 and 5 years post-op
- **Straylight** at year 5 was $1.21 \pm 0.23 \log(s)$ and **20% of eyes had lower values** than their age-matched crystalline lens
- **92%** of patients became completely **spectacle-independent** at all distances



Conclusions

- Liberty provided stable performance throughout the follow-up period regarding both visual acuities and contrast sensitivity.
- The apodized diffractive central structure with 7 rings seem to reduce the postoperative glare and halo symptoms.

6 Influence of corneal higher order aberrations on visual performance with a multifocal intraocular lens

Fernández J, Burguera N, Calvo-de-Mora MR, Rocha-de-Lossada C, Rodríguez-Vallejo M. Influence of Corneal Higher Order Aberrations on Visual Performance With a Multifocal Intraocular Lens. *J Refract Surg.* 2025 Apr;41(4):e291-e299. doi: 10.3928/1081597X-20250213-01. Epub 2025 Apr 1. PMID: 40197073.

Number of patients / eyes and duration

270
patients

270
eyes

3
months

Results

- Higher order aberrations (HOAs) at 4 mm corneal diameter rarely exceeded 0.3 μm
- Visual acuity and contrast sensitivity **area under the curves were not correlated with HOAs**, mainly due to moderate Total HOA values
- **0.2 μm for coma and trefoil** aberration at **4 mm corneal diameter** are **absolutely safe** for Liberty implantation
- **0.1 μm for primary spherical aberration at 4 mm corneal diameter** (approximately 0.3 μm at 6 mm) is also a considerable cutoff value
- Higher values for HOA components are uncommon, but might still be safe when implanting Liberty

Conclusions

- The widely used cutoff values are proved to be a considerable patient selection criterion.
- Although a definite HOA cutoff value for Liberty was not determined, but even higher-than-normal values did not automatically cause decreased visual performance.

7 Influence of a multifocal intraocular lens centration and eye angles on light distortion and ocular scatter index

Fernández J, Burguera N, Rocha-de-Lossada C, Rachwani-Anil R, Rodríguez-Vallejo M. Influence of a multifocal intraocular lens centration and eye angles on light distortion and ocular scatter index. *Graefes Arch Clin Exp Ophthalmol.* 2023 Aug;261(8):2291-2299. doi: 10.1007/s00417-023-06028-x. Epub 2023 Mar 8. PMID: 36884063.

8 Evidence-based functional classification of simultaneous vision intraocular lenses: seeking a global consensus by the ESCRS Functional Vision Working Group

Ribeiro F, Dick HB, Kohnen T, Findl O, Nuijts R, Cochener B, Fernández J. Evidence-based functional classification of simultaneous vision intraocular lenses: seeking a global consensus by the ESCRS Functional Vision Working Group. *J Cataract Refract Surg.* 2024 Aug 1;50(8):794-798. doi: 10.1097/j.jcrs.0000000000001502. PMID: 39083407.

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