



THE MOST BALANCED TRIFOCAL IOL

STRONG NEAR VISION

One of the main strengths of Liberty Trifocal IOL (Medicontur) in comparison to other trifocal IOLs is **the higher and extended range of near vision**. Patients achieve a higher depth of focus at near and this is the most important for us in a premium IOL implant that aims for spectacle independence. You will always find surprises with multifocal IOLs, but when you maintain a sufficient range of near vision focus these surprises tend to be less critical than those experienced with other trifocal IOLs from the past.

EFFICIENCY THROUGH USING OCULAR PHYSIOLOGY

We got used to incorrectly labelling IOLs as "pupil-dependent" or "pupil-independent" while we forget that it is the patient who is "pupil-dependent", not the IOL design. The function of the pupil plays an important role in the performance of trifocal IOLs, as it controls the intensity of light going through the specific lens zones.

Once you measure the pupils you discover that Liberty can maintain **near vision in low light conditions**. We usually test our patients in low photopic light conditions (90 lux) and in these conditions they achieve a mean of 20/25 for near and 20/32 for intermediate monocular vision, and one additional line of visual acuity in binocular vision.

Liberty has an intermediate vision weakness in patients with pupils larger than 3.5 mm in low photopic conditions. In these cases patients should increase environmental light, which decreases pupil size leading to improved intermediate vision.



DESIGN MATTERS

Premium technology also demands premium design. The square edges of the optic in Liberty ($\leq 10 \mu$; 360°) are designed to prevent posterior capsule opacification (PCO), which is often one of the factors limiting success of multifocal IOLs.

The large size of the IOL and its double loop haptic design are considered to be very important features for postoperative stability, particularly for toric MIOLs.

After one year of experience with Liberty we have realised that not all hydrophilic IOLs produce the same rate of PCO. With Liberty, after 12 months 83% of our patients remained in grade 0 and 17% in grade 1 for PCO classification, whereas the previous hydrophilic IOL we implanted achieved percentages of 44% in grade 0, 29% in grade 1 and 27% with higher degrees of PCO after the same follow-up time. In short, with **Liberty we reduced our PCO rates at 12 months**.

CONTRAST SENSITIVITY, DYSPHOTOPSIA AND LIGHT SCATTERING

There is always some level of compromise in contrast sensitivity with diffractive multifocal IOLs. Light scattering induced by IOLs is caused by each single diffractive step and, depending on the manufacturing quality, these light scatters can occur on multiple points on each step.

Therefore not only the quality but also the quantity of the manufactured steps can have a great impact on the amount of correctly utilized light energy within the eye and influence contrast sensitivity. Liberty achieves trifocality with only 7 diffractive rings which is the lowest number amongst the leading MIOLs today.

We are truly convinced that the **7-ring technology is enough to maximize visual performance at multiple distances** with the main advantage of avoiding additional light scattering produced by the narrow peripheral rings in night vision. Although dysphotopsia with MIOLs is a topic which needs more relevant scientific evidence, theoretical simulations confirmed our expectations of reduced glare and halos with Liberty.

Nevertheless, in our experience dysphotopsia is a short-term phenomenon, decreasing in the long-term. Furthermore, while dysphotopsia and loss of contrast sensitivity are limiting factors for implantation of multifocal IOLs today, it should not be forgotten that dysphotopsia and contrast sensitivity reduction are also experienced by patients with cataract.

One of our main worries was to determine the proper age and preoperative degree of cataract that can lead to the highest positive experience after surgery, increasing not only close and intermediate range visual performance but also producing a positive experience in dysphotopsia and contrast sensitivity. With Liberty 50% of patients at around 60 years of age or with a cataract degree of CN1 on the LOCS III scale will actually improve their contrast sensitivity and experience less dysphotopsia in comparison to their preoperative vision with best spectacle refraction.

Joaquín Fernández, MD, PhD
joaquinfernandezoft@qvision.es

