

Why I Am Not Implanting Multifocals

Each surgeon must determine the approach to premium-channel IOL surgery that will work for him or her.

BY J. E. "JAY" McDONALD II, MD

I believe that finding one's personal and one's practice's "final destination" in the universe of premium-channel lens surgery will be among the most critical journeys upon which each ophthalmologist will embark during the next decade. The choices entailed represent a significant challenge. This article details how I decided to offer monofocality rather than multifocality to my patients.

BACKGROUND

For many years, I had been using a version of monovision to help my patients possibly depend less on glasses. Until 4 years ago, I did not consider this approach anything other than a value added. I did not tell patients that they would not need spectacles after surgery, but many times they did not. My staff and I celebrated these individuals' newfound freedom with a pat on their back and a request that they share the good news with their friends.

I began implanting a few multifocal lenses. I carefully selected patients, and because I emphasized reasonable expectations for the procedure, many of them were happy. Some needed a lot of reassurance, most needed some handholding, but all did well. The turning point for me occurred when I implanted a multifocal IOL in the eye of a woman to whose husband I had provided monovision. Although she had an emmetropic result, she complained constantly of poor vision and not seeing as well as her husband. I was confused by her response.

At that time, I attended an ophthalmic meeting. In a large forum, the speaker asked, "Who has removed a multifocal lens because of an unhappy patient?" The

hands raised revealed that almost all of the attendees had experienced this problem. I wondered why. I have a large contact lens practice, and despite the release of numerous multifocal designs, my staff and I almost always returned to a monovision approach. LASIK monovision was also quite successful in my practice. I wanted to know why monofocality trumped multifocality. I suspected that the answer related to the way each worked at the neurocognitive level.

AN INVESTIGATION

Three years ago, I met Randolph Blake, PhD, centennial professor of psychology, a fellow of the Vanderbilt Kennedy Center for Research on Education and Human Development, and a member of the Vanderbilt Vision Research Center and the Vanderbilt Center for Cognitive and Integrative Neuroscience in Nashville, Tennessee. Dr. Blake had written about how people see and the role of the neurocortex and binocular rivalry.¹⁻³ I had also been intrigued by lectures by Marty Sereno, PhD, a professor of psychology and chair of cognitive neuroimaging at Birkbeck, University of London, and an adjunct professor of cognitive science at the University of California, San Diego. Dr. Sereno stated that functional MRI descriptions reveal how people see.

I convinced Dr. Blake to visit my practice to compare multifocality and monovision in my patients. What was the basic science of these two processes? After reviewing the clinical results, he discovered that the monofocal image gives the brain the best signal for constructing the final visual image. By challenging the receptors with split

(Courtesy Martin A. Mainster, PhD, MD, FRCOphth.)

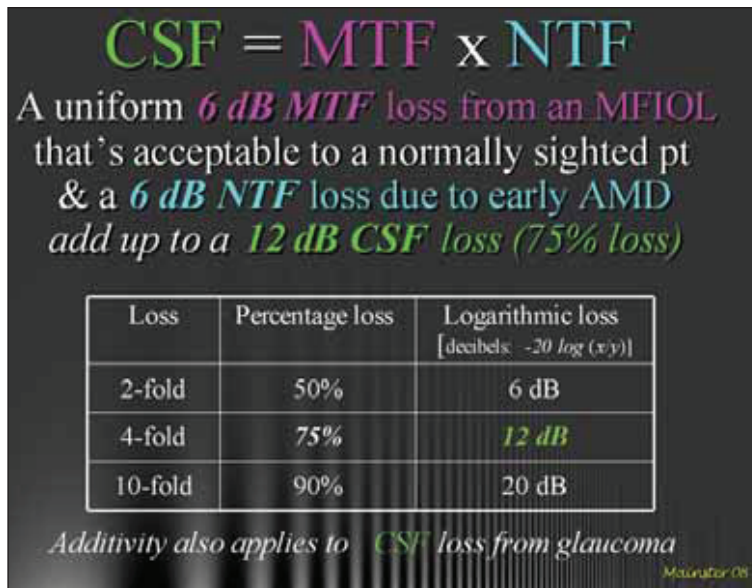


Figure 1. Using a multifocal IOL decreases the reserved visual sensitivity of the neuro transfer function. A person with a normal reserve may not notice this diminution. The additional loss of early maculopathy, however, may deplete the neuro transfer function to a level that is very noticeable clinically. Abbreviations: AMD, age-related macular degeneration; CSF, contrast sensitivity function; MFIOL, multifocal IOL; MTF, modulation transfer function; NTF, neuro transfer function; pt, patient.

images, multifocality robs the visual cortex of the signal strength it needs to consistently construct a clear, sharp image. Dr. Blake thus explained to me why patients who received a multifocal diffractive IOL complained of waxy vision.

MY APPROACH

The pupil's size acts like an f-stop on a camera. After 60 years of age, most people spend little time with pupils larger than 3.2 mm. Monofocality uses this limited sizing as a strength. If I implant a monofocal aspheric optic with 1.25 D offset (distance, plano to -0.25 D; near, -1.25 to -1.50D), the patient will have clear binocular vision from 22 inches to infinity with a small area of very tolerable blur at 4 to 7 feet. I have tested patients for stereopsis, and they have 40 to 60 seconds with this degree of separation and no spectacle correction.

My premium IOL channel involves no multifocal lenses. Instead, I use the Crystalens AO (Bausch + Lomb, Rochester, NY), with mini-monovision of -0.50 D in the patient's nondominant eye and -0.25 D in his or her dominant eye. This technique represents my first tier of premium IOL surgery.

For my second tier, I use an aspheric lens—the Sofport AO (Bausch + Lomb), Akreos AO Micro

Incision (MI60; Bausch + Lomb), or iSymm (Hoya Surgical Optics, Inc., Chino Hills, CA). With aspheric IOLs, patients have clear vision, and the offset of monovision is relatively small. I find that the quality of vision and depth of focus achieved with a small pupil offset the expanded depth of field of a nonaspheric lens. The positive asphericity of the cornea, however, adds some depth of field.

With monofocality, I am not compromising patients' visual reserve by splitting light. Martin Mainster, PhD, MD, has shown that, when someone uses a multifocal IOL, half of his or her visual reserve is gone.⁴ Most of these patients do not complain, but any further retinal deterioration will cause them to become symptomatic (Figure 1). This potential causes me great concern when I consider the average patient's life expectancy and his or her chance of macular functional loss. Moreover, a number of my patients will suffer deficiencies in optic nerve transmission due to glaucoma and general vascular deterioration.

CONCLUSION

When ophthalmologists raise their profile and present themselves as surgeons who can deliver on-target spherical endpoints and eliminate astigmatism, patients expect independence from spectacles. Ophthalmologists can achieve these goals through monofocality or multifocality. I prefer monofocality, which I know can free patients from spectacles while preserving for as long as possible their ability to function at their highest visual potential. As a "steward" of my patients' visual capacity, I believe that I have a responsibility to preserve the greatest amount of their neuro and modulation transfer functions as possible, the product of which is their total visual capacity. ■

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