Two-Tiered Standards for Visual Function

BY LEE T. NORDAN, MD

Refractive surgery represents one of the major advances in ocular surgery, but some forms of refractive correction, such as multifocal IOLs and LASIK, have created two tiers of acceptable visual function. In the first tier, the postoperative result meets with the patient's expectations in terms of visual acuity. This is not the case in the second tier, in which the surgical outcome is degraded by side effects such as halos and glare. No surgical procedure is perfect, and there is no foolproof way to predict whether a patient will be happy and/or satisfied after surgery.

For many years, I have been interested in the patterns of behavior that accompany the acceptance of surgical and technological progress in ophthalmology. This article describes how physicians can use the pattern of acceptance as a guide for counseling their patients and achieving the greatest amount of success possible with multifocal IOLs, both in terms of visual acuity results and patients' satisfaction.

THE ACCEPTANCE CURVE

In the April 2008 edition of *Cataract & Refractive Surgery Today*, I introduced what I term an *acceptance curve* for a new product or procedure. It demonstrates three basic stages of acceptance: (1) the hyperbole of hope (when expectations are high), (2) increasing discontent (as complications become apparent), and (3) the long-term acceptance level (after a patient accepts a compromise between 1 and 2).[1]

A practical example of the acceptance curve is the pattern of acceptance for LASIK. After a long period of developmental research, a significant group of ophthalmologists championed LASIK, and the procedure was subsequently employed to correct extreme refractive error (> -10.00 D of myopia) and even cases of mild keratoconus associated with myopia. After a period of complications that arose from stretching the limits of the procedure, LASIK settled into a range for which complications are now minimal.

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In the same vein, why, more than 5 years after their clinical introduction, have the complications of multifocal IOLs become such an important topic?

PATIENTS' EXPECTATIONS

To understand why the acceptance of multifocal IOLs has changed in recent years, we ophthalmologists must first consider the patients in whom we are implanting these lenses. In the past, the age range of patients considered candidates for a multifocal IOL tended to be 65 to 70 years of age—those requiring cataract extraction. This patient population was generally grateful for a distinct improvement in their vision, despite the side effects of halos and glare.

Today, we are routinely implanting multifocal IOLs in patients as young as 50 years of age. These individuals are usually accustomed to excellent corrected vision and expect high-quality vision postoperatively. Additionally, they are more vocal about side effects such as halos and glare than their older counterparts. The differences in the profiles and expectations of these two groups of patients have made multifocal IOL surgery more of a refractive (elective) procedure than a cataract (nonelective) procedure.

COUNSELING PATIENTS

All cataract and refractive surgeons should be aware that multifocal IOLs require some sort of optical compromise on the part of the patient to achieve adequate distance and near visual function. In the FDA trials of current multifocal IOLs, mild or significant glare or halos were reported in approximately 10% to 15% of cases overall, suggesting that one of eight

patients who receive a multifocal IOL will experience glare and halos.

It is important to explain this optical compromise preoperatively in a way that patients can understand. To set realistic expectations, I recommend having patients complete a contact lens trial, using graduated diffractive lenses with variable optical surfaces created by the manufacturer of the selected multifocal IOL. These lenses should create a mild yet quantifiable amount of glare and halos so that the patients can experience the vision they will have after receiving a multifocal IOL. It is my opinion that this preoperative testing with contact lenses will not only prepare patients for their postoperative experience, but it will be a valuable addition to our informed consent procedure.

NEW TECHNOLOGY

I can think of three developments that would improve on the currently available designs. First, patients would benefit from a multifocal optic that creates a significantly lower amount of halos and glare than current designs. Another attractive possibility would be a multifocal IOL for which the presbyopia-correcting element could be removed or erased to leave a single-vision lens that does not cause glare. Alternatively, an IOL with an accommodative amplitude of 2.50 to 3.00 D that could be implanted easily through a small incision in the eyes of all patients would be a major advance.

At present, LASIK and multifocal IOLs achieve varying levels of success, depending on the patient's age and degree of preoperative ametropia. The results with both forms of treatment are often acceptable to the patient but represent a significant compromise with respect to high-contrast 20/20 visual acuity at distance. Presbyopic and cataract surgery patients will gladly sacrifice a certain amount of contrast sensitivity for uncorrected near visual function. The standards by which ophthalmologists evaluate successful ocular surgery continue to evolve with the development of new technologies and surgical procedures. LASIK and multifocal IOLs therefore underscore how important it is for surgeons to document their postoperative results, especially when these ophthalmologists are transitioning from nonelective to elective surgery, even when it involves the same surgical device. ■

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1. Nordan LT. Everything's relative. Cataract & Refractive Surgery Today. April 2008;8(4):18-19. http://www.crstoday.com/PDF%20Articles/0408/CRST0408_02.php. Accessed December 11, 2008.