

Advanced
OCULAR CARE

Improving
**Integrated
Eye Care**

**Collaborative Patient
Management for
Premium IOLs**



Contributors:

- Robert E. Prouty, OD, FAAO
- Stephen S. Lane, MD
- Richard Tipperman, MD
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Part three of a four-part series





The changing landscape of health care delivery paired with a rising number of patients has led to a demand for the improved integration of ophthalmology and optometry in providing vision care. For some clinicians, this integration requires a change in paradigm, while others have already adopted a collaborative care model with success. This four-part series offers eye care professionals the tools necessary for improving the integrated delivery of care, and it provides valuable information on achieving better outcomes and enhancing patients' satisfaction.

Contributors

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Are You Ready for the Greying of America?

Baby boomers' expectations are reflected by health care trends.

BY ROBERT E. PROUTY, OD, FAAO



The United States experienced the largest increase in births in the country's history after the American soldiers returned from WWII.¹ Sociologists have defined those born between 1946 and 1964 as "baby boomers."

Although many folks born on the fringes of that time frame do not think of themselves as baby boomers, their lifestyles, actions, and socialization are heavily influenced by this generation.

The decade that basically defined the baby boomers era was the 1960s.² Those who were born after the "time of enlightenment" have little memory of this decade that truly changed the course and mindset of the United States.

As Table 1 and Figure 1 depict, the wave of births

It has been stated that, another boomer turns 50 years of age every 7 seconds, and the math just about works out to that if we use 1960 when there were more than 4.2 million babies born.

went from approximately 2.8 million to 3.4 million in a mere 6 years. The end of the boom is not as clear but is often felt to have occurred when the birth rate dropped below 4 million in 1964. The next great tide is when the boomers were having their children in the

TABLE 1. BIRTH RATES PER YEAR (EG, 1953 = 3,965 OR 3,965,000/~4 MILLION BIRTHS) ACCORDING TO DATA FROM THE US DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS

1940	2,559	1954	4,078	1968	3,502	1982	3,681
1941	2,703	1955	4,097	1969	3,606	1983	3,639
1942	2,989	1956	4,218	1970	3,731	1984	3,669
1943	3,104	1957	4,300	1971	3,556	1985	3,761
1944	2,939	1958	4,255	1972	3,258	1986	3,757
1945	2,858	1959	4,245	1973	3,137	1987	3,809
1946	3,411	1960	4,258	1974	3,160	1988	3,910
1947	3,817	1961	4,268	1975	3,144	1989	4,041
1948	3,637	1962	4,167	1976	3,168	1990	4,158
1949	3,649	1963	4,098	1977	3,327	1991	4,111
1950	3,632	1964	4,027	1978	3,333	1992	4,065
1951	3,823	1965	3,760	1979	3,494	1993	4,000
1952	3,913	1966	3,606	1980	3,612	1994	3,979
1953	3,965	1967	3,521	1981	3,629		

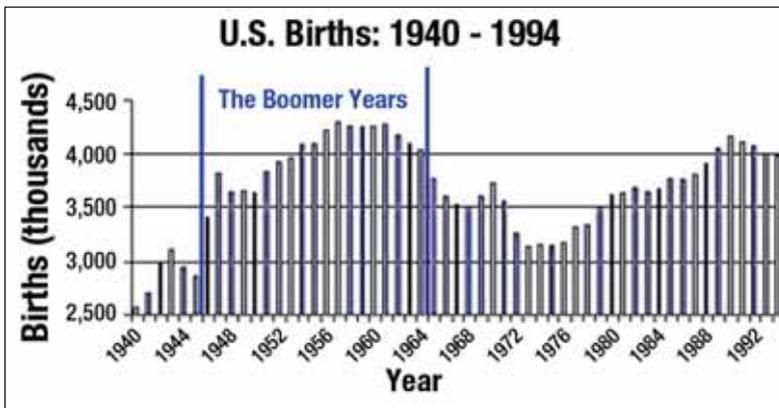


Figure 1. The wave of births went from about 2.8 million to 3.4 million in 6 years.

late 1970s to 1990s.¹

Bill Geist in his book *The Big 5-Oh! Facing, Fearing, And Fighting Fifty*³ said another boomer turns 50 years of age every 7 seconds, and the math just about works out to that if we use 1960 when there were more than 4.2 million babies born (eg, 4.258 million births/365 days = 11,665.7 births/day; 11,665.7 births/24 hours = 486 births/hour; 486 births/60 minutes = 8.1 births/minute).

Boomers represent 28% of the US population, but in 1964, they represented 40%. No wonder 19-year-olds in 1964 garnered so much attention! Using 1946 to 1964 as the boomer years, these individuals are now 46 to 64 years of age.⁴ They represent the majority of the US workforce, making them the US economic engine. There are an estimated 76 to 78 million boomers that in the 1990s were working their way up to their peak earning and spending years. It is estimated that they hold \$13 trillion in assets, which is 50% of the US asset base. This represents more than 80% of personal financial assets and more than 50% of the discretionary spending power. Their life expectancy has ballooned to 78.5 years for men and 82.5 years for women. There are 25% who think they will not have enough money to retire, 36% feel they have enough to be comfortable, and 74% are looking forward to retirement. They influence what kind of cars are being bought (perhaps explaining the popularity of the SUV), the type of blockbuster movies being watched, the genre of the most successful television shows, and why "Archie Bunker" and "MASH" changed television at the time. Baby boomers continue to define the United States, particularly in our country's consumer culture and even in the midst of economic downturns.⁵

BABY BOOMERS AND HEALTH CARE TRENDS

The boomers' expectations (based on their youth) are now being reflected by health care trends. The first of the baby boomers will turn 65 years old in 2011—reaching Medicare age.² Suffering mainly from high blood pressure, arthritis, and diabetes, they comprised 50% of all doctor visits in 2001 (27 million visits were for diabetes). This was a 63% increase from 1992. According to the Centers of Disease Control and Prevention, 53% of the patients visiting doctors in 2001 were older than 45 years of age compared with only 42% in 1992.^{1,6} These individuals are usually early adopters of innovations

and are probably more apt to try to stay young (eg, cosmetically and physically). Seventy-four percent of boomers are currently working and most will work well into their 70s. Their health and vision demands will also expand.

More than 16 million seniors engage in social networking Web sites including Facebook, Twitter, and MySpace, spending an average of 204 minutes per month on these sites.⁷ Therefore, their demands for excellent vision will sustain—if not increase—with technological innovations.

As the baby boomers age, they will experience an increased incidence of glaucoma, diabetic eye disease, and cataracts, consistent with noted trends.

PREPARING TO TREAT BABY BOOMERS

How prepared are you to meet this population's eye care challenges? Have you remained current with technological advances in health care delivery? Are you embracing the newest ophthalmic technologies?

As the baby boomers age, they will experience an increased incidence of glaucoma, diabetic eye disease, and cataracts, consistent with noted trends. Making this group aware of these ocular risks is a must. Embracing the newest innovations in IOLs so these boomers can sustain their visual needs well into their later working years, as well as into their retirement,



will be very attractive if not essential for them to compete with the second wave of “babies.” Their increased expectations regarding outcomes is unprecedented. With the extensive access to information on the Internet as well as that gleaned through their social networking, these prospective patients are very well informed.

Adequate vision is not an endpoint baby boomers are willing to accept. Early detection of disease, effective intervention when needed, and multifunctional visual outcomes are what they anticipate. Immediate gratification is barely acceptable. Strategic planning to meet this need with proper staffing, office ergonomics, and services offered is needed to survive the health care reform that is being thrust upon our patients and ourselves as providers. Based on the statistics noted previously, we cannot afford to wait to embrace new

office diagnostic instrumentation access, updated glaucoma and therapeutic medication regimens, toric and presbyopia-correcting IOL designs, and advanced laser refractive technologies. We must keep an eye on this wave, for it has come on shore now.

1. The Centers for Disease Control and Prevention. Vital statistics of the United States, 2003, Volume I, Natality. Live births, birth rates, and fertility rates, by race: United States, 1909-2003. <http://www.cdc.gov/nchs/products/vsus.htm>. Accessed: July 26, 2010.
2. US. Census Bureau – Oldest boomers turn 60. January 3 2006. http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb06-ffse01-2.html. Accessed: July 26, 2010.
3. Geist W. *The Big Five-Oh!: Facing, Fearing, And Fighting Fifty*. New York, NY: William Morrow and Company, Inc.; 1997.
4. Baby Boomer Headquarters. www.bbhq.com. Accessed July 26, 2010.
5. Baby Boomer Statistics. http://seniors.lovetoknow.com/baby_boomer_statistics. Accessed July 26, 2010.
6. Advance Data From Vital and Health Statistics, #337, August 11, 2003: <http://www.cdc.gov/nchs/data/ad/ad337.pdf>. Accessed: July 26, 2010.
7. Boomer Market Advisor. How well do you know your baby boomer clients? <http://www.boomermarketadvisor.com/issues/2010/january/Pages/How-well-do-you-know-your-baby-boomer-clients.aspx>. Accessed July 26, 2010.



High-Technology IOLs

What do surgeons need to know?

BY STEPHEN S. LANE, MD



Today's ophthalmologists have a number of IOL options to offer their cataract surgery patients. Choosing the best alternative is a complex decision. There are several factors that surgeons need to account for, including patients' desires and expectations, status of the non-operative eye, presence of any comorbidities, and potential risks. It is crucial that surgeons discuss all of these dynamics with their patients so they can understand their choices.

ASPHERIC IOLs

Spherical aberration occurs when incoming light rays are overrefracted at the periphery of optical structures, such as the cornea, natural lens, or a spherical IOL. This results in a region of defocused light that can decrease image quality. This most frequently happens under dim light when a normal pupil dilates and the rays enter the eye through the periphery of the cornea or spherical IOL. Clinically, this is manifested as glare and halos. These marginal rays come into focus in front of the more central paraxial rays, inducing positive spherical aberrations. An aspheric IOL aligns the light rays to compensate for the positive corneal aberration, which results in enhanced clarity and image quality. Also, some IOLs are thinner such as the AcrySof IQ IOL (Alcon Laboratories, Inc., Fort Worth, TX), which permits surgeons to create smaller incisions, which are more likely to be self-sealing.

Studies have been performed using the AcrySof IQ IOL (model SN60WF) that demonstrate superior functional performance in contrast sensitivity with a night-driving simulator compared with a spherical control and improvement in mesopic contrast sensitivity.¹⁻³

TORIC IOLs

In recent years, advances in cataract surgery and IOL technology have provided better refractive outcomes. These improvements have led to an increase in patients' expectations, including spectacle independence for distance vision. Unfortunately, approximately

Toric IOLs for the correction of astigmatism have been under development for more than a decade. Issues with rotational instability, however, have marred the success of these lenses.

one-half of cataract surgery patients have substantial corneal astigmatism (≥ 0.75 D) that cannot be reduced or eliminated with traditional IOLs. Thus, there are approximately 1.5 million Americans for whom traditional IOL technology is incapable of providing spectacle independence for distance vision each year.^{4,5}

Toric IOLs for the correction of astigmatism have been under development for more than a decade. Issues with rotational instability, however, have marred the success of these lenses. According to some studies, significant rotation of more than 15° to 20° occurred in 16% to 25% of cases.⁶⁻⁹ Rotation degrades a toric IOL's corrective power by 3.3% for every degree the lens turns off axis.¹⁰ Rotations of more than 30° , therefore, may induce additional astigmatism.

Alcon Laboratories, Inc. recently launched a single-piece, acrylic AcrySof IQ Toric IOL. This design provides spherical and astigmatic correction. The aspheric design of the IOL improves contrast sensitivity. Other advantages include its unique haptic design and a bioadhesive material that improves the conformance of the lens to the capsular bag.^{11,12} The slight tackiness of the lens' material enhances its stability and minimizes rotation.

A comparative, multicenter, prospective clinical trial of the AcrySof Toric IOL (models SA60T3, SA60T4, and SA60T5—a group referred to as SA60TT in this article) and a control monofocal IOL (model SA60AT) assessed lens rotation, residual astigmatism, UCVA, and spectacle freedom for distance vision. Approximately 250 patients received the SA60TT, and 250 were implanted with the SA60AT. All patients



were followed for 1 year after lens implantation in their first eye; 6-month data are available.^{13,14}

STABILITY WITHIN THE LENS CAPSULE

The AcrySof Toric IOL demonstrated excellent stability within the capsular bag. The average rotation was less than 4° from the lens' initial placement through 6 months postoperatively. The AcrySof Toric lens stays in position and is stable.

ASTIGMATIC REFRACTIVE CYLINDER

Three toric models were used in the clinical study to correct 1.50, 2.25, and 3.00 D of astigmatism, respectively, at the IOL plane. The AcrySof Toric IOL significantly reduced or eliminated absolute residual refractive cylinder when compared with the control lens. Specifically, the eyes implanted with toric lenses were three times more likely to achieve a residual refractive cylinder of 0.50 D or less compared with the control.

VISUAL ACUITY

At the 6-month visit, approximately 66% of the unilateral toric patients and 41% of the unilateral control patients achieved a UCVA of 20/25 or better. For those patients (n=37) who received AcrySof Toric IOLs bilat-

Additionally, the AcrySof Toric IOL considerably improved patients' spectacle freedom for distance vision relative to the control lens.

erally, 97% achieved 20/25 or better UCVA compared with 77% of controls (n=22). Additionally, the AcrySof Toric IOL considerably improved patients' spectacle freedom for distance vision relative to the control lens. In the clinical study, 60% of the 207 patients examined at 6 months who received the toric lens in one eye achieved spectacle freedom for distance vision.

Toric IOLs enable surgeons to offer a great service to their patients and provide an easy segue into the refrac-

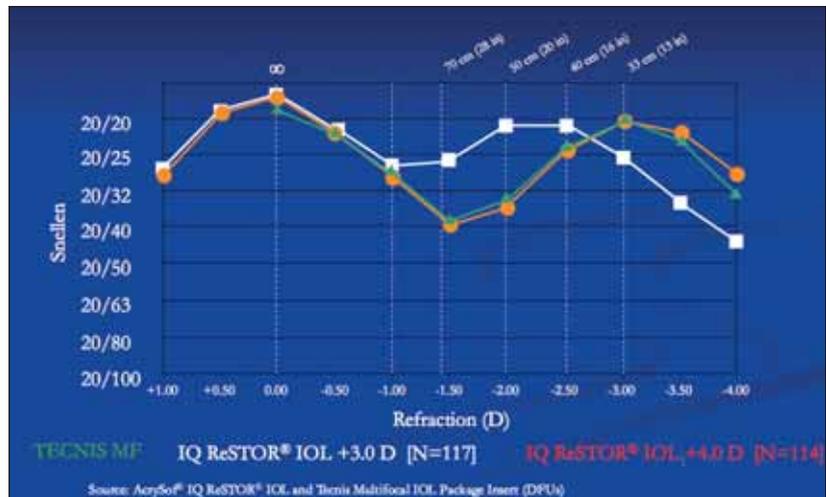


Figure 1. Binocular defocus curve for the AcrySof IQ ReSTOR +3.0 D.

tive cataract marketplace. The technique for their implantation will be familiar to ophthalmologists who routinely perform cataract surgery. Compared with presbyopia-correcting IOLs, toric IOLs are easier to incorporate into practice; the latter demand much less chair time, commitment to staffing, educational development, and practice-process retooling.

PRESBYOPIA-CORRECTING IOLs

Cataract surgery using standard monofocal or toric IOLs greatly improve BCVA, but emmetropic patients remain largely dependent on spectacles for near and intermediate tasks. The availability of presbyopia-correcting IOLs makes functional vision across a broader range of distances (including intermediate and near distances) possible. Within this category of IOLs, surgeons can choose from accommodating, refractive, and diffractive IOLs.

ACCOMMODATING IOLs

True accommodating IOLs induce a transient and rapidly reversible change in the optical power of the eye. This is accomplished in one of two ways: (1) a change in the shape of the lens in the eye or (2) a change in the position of the lens within the eye. Accommodating IOLs generally are not associated with loss of contrast sensitivity. The Crystalens (Bausch + Lomb, Rochester, NY) is the only IOL approved for use in the United States in this category.

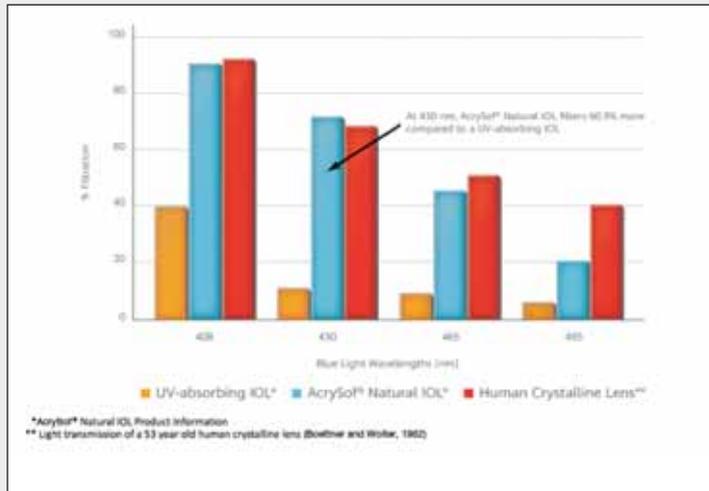
MULTIFOCAL IOLs

Multifocal IOLs are divided into refractive (ReZoom;



ACRYSOF IQ NATURAL IOL

In 2003, Alcon pioneered the AcrySof Natural IOL, which includes a yellow chromophore. The chromophore provides protection from chronic UV and blue-light exposure for pseudophakic eyes.¹ The natural yellowing of the human crystalline lens provides some protection from blue light, and when a cataract is removed, the artificial lens that replaces it may have different properties in terms of UV and blue-light transmission of energy. Studies indicate that blue light can be harmful to the retinal pigment epithelial cells, and epidemiological research suggests a correlation between excessive blue-light exposure and age-related macular degeneration. In contrast, laboratory studies have shown that the addition of chromophore to the AcrySof platform approximates the same filtration of harmful light as a human crystalline lens.



The AcrySof Natural IOL blue-light filtration.

1. Mainster MA. Spectral transmittance of intraocular lenses and retinal damage from intense light sources. *Am J Ophthalmol.* 1978;85(2):167-170.

Abbott Medical Optics Inc., Santa Ana, CA) or diffractive categories (AcrySof IQ ReSTOR, Alcon Laboratories, Inc.; and the Tecnis Multifocal IOL, Abbott Medical Optics Inc.). Of these, diffractive IOLs are much more commonly used.

The Tecnis Multifocal IOL is a full-optic aspheric diffractive lens containing 32 concentric rings that deliver 4.00 D of near add power at the IOL plane and a 50/50 near/far split in effective light distribution. It is available in both silicone and acrylic on a three-piece platform and in acrylic in a single piece. According to the product label, 33 cm is the optimal distance for near

Multifocal IOLs are divided into either refractive or diffractive categories. Of these, diffractive IOLs are much more commonly used.

vision.¹⁵ As a result of the full-diffractive aspheric optic, decentration of the lens should not cause any degradation of the multifocal effect. However, if significantly decentered, coma could be induced due to the asphericity of the optic.

The AcrySof IQ ReSTOR IOL is an aspheric refractive/diffractive optic, consisting of a 3.6-mm apodized diffractive optic centrally surrounded by a monofocal zone that extends to 6.0 mm. This lens is available as both +3.0 D and +4.0 D power on a single-piece acrylic platform. The AcrySof IQ ReSTOR IOL +4.0 D is similar to the Tecnis Multifocal IOL, giving optimal near vision at 33 cm. The AcrySof IQ ReSTOR +3.0 D, however, gives optimal near vision at 40 to 50 cm and improved intermediate vision at 70 cm compared to a +4.0 D optic (Figure 1).

Because of the light-splitting properties of multifocal lenses, surgeons need to identify and manage visual disturbances. In general, these visual disturbances manifest themselves in the form of visual glare and halos, which are especially noticeable under dim lighting conditions. A questionnaire was utilized during the FDA clinical trials that specifically asked patients enrolled in the study about their experience with glare and halos postoperatively. Comparing the product labels at the 4- to 6-month time period, the Tecnis Multifocal IOL demonstrated a 25% incidence of severe glare and flare, a 35% incidence of severe halos, and a 12% incidence of severe night vision issues. This compares with the AcrySof IQ ReSTOR IOL +3.0 D at 6 months of 5.0%, 6.5%, and 2.0%, respectively. These differences are believed to be due to both the apodization of the IQ ReSTOR IOL as well as the design of the optic.¹⁶



CONCLUSION

There is a certain amount of confusion in the refractive cataract marketplace currently, because the various presbyopia-correcting lenses each perform a little bit differently. I think it is important to gain experience with each of these lens choices and learn their pros and cons. Each of these lens technologies offers the cataract patient the opportunity to enjoy excellent visual acuity with spectacle and contact lens freedom. In turn, each IOL choice is a possible alternative depending on the unique visual needs and desires of the patient. I advise eye care providers to become educated about these technologies because I think each has its place. Whether the choice is conventional cataract surgery, presbyopia-correcting lenses, toric IOLs, or aspheric IOLs, nearly every patient can benefit. It is a very exciting time to be practicing, and eye care specialists should become engaged and educate their patients about the opportunity these new technologies allow.

1. Pandita D, Vasavada A. Contrast sensitivity and glare disability after implantation of AcrySof IQ Natural aspheric intraocular lens. *J Cataract Refract Surg.* 2007;33:603-610.
2. Tzelikis, PF. Ocular aberrations and contrast sensitivity after cataract surgery with AcrySof IQ intraocular lens implantation. *J Cataract Refract Surg.* 2007;33:1918-1924.
3. AcrySof IQ IOL [package insert]. Forth Worth, TX: Alcon Laboratories, Inc.
4. The Eye Diseases Prevalence Research Group. Prevalence of cataract and pseudophakia/aphakia among adults in the United States. *Arch Ophthalmol.* 2004;122:487-494.
5. Riley AF, Grupcheva CN, Malik TY, et al. The Auckland Cataract Study: demographic corneal topographic and ocular biometric parameters. *Clin Experiment Ophthalmol.* 2001;29:381-386.
6. Sun XY, Vicary D, Montgomery P, Griffiths M. Toric intraocular lenses for correcting astigmatism in 130 eyes. *Ophthalmology.* 2000;107(9):1776-1781; discussion 1781-1782.
7. Till JS, Yoder PR Jr, Wilcox TK, Spielman JL. Toric intraocular lens implantation: 100 consecutive cases. *J Cataract Refract Surg.* 2002;28:295-301.
8. Ruhswurm I, Scholz U, Zehetmayer M, et al. Astigmatism correction with a foldable toric intraocular lens in cataract patients. *J Cataract Refract Surg.* 2000;26(7):1022-1027.
9. Guell JL, Vázquez M, Malecaze F, et al. Artisan toric phakic intraocular lens for the correction of high astigmatism. *Am J Ophthalmol.* 2003;136:442-447.
10. Sanders DR, Grabow HB, Shepherd J. The toric IOL. In: Gills JP, Martin RG, Sanders DR, eds. *Sutureless Cataract Surgery: an Evolution toward Minimally Invasive Technique.* Thorofare, NJ: Slack Inc.; 1992: 183-197.
11. Lane SS, Burgi P, Milios GS, et al. Comparison of the biomechanical behavior of foldable intraocular lenses. *J Cataract Refract Surg.* 2004;30(11):2397-2402.
12. Linnola RJ, Werner L, Pandey SK, et al. Adhesion of fibronectin, vitronectin, laminin, and collagen type IV to intraocular lens materials in pseudophakic human autopsy eyes. Part 1: histological sections. *J Cataract Refract Surg.* 2000;26(12):1792-1806.
13. Lane SS. The AcrySof Toric IOL's FDA Trial Results. *Cataract & Refractive Surgery Today.* 2006;May 6(5):66-68.
14. AcrySof IQ Toric IOL [package insert]. Fort Worth, TX: Alcon Laboratories, Inc.
15. Tecnis Multifocal IOL [package insert]. Santa Ana, CA: Abbott Medical Optics Inc.
16. AcrySof IQ ReSTOR IOL [package insert]. Forth Worth, TX: Alcon Laboratories, Inc.



Toric IOL Marking

Toric IOLs allow surgeons to reliably treat astigmatism at the time of cataract surgery.

BY RICHARD TIPPERMAN, MD



Marking the correct axis to properly orient the AcrySof IQ Toric IOL (Alcon Laboratories, Inc., Forth Worth, TX), is important for a successful surgical outcome. Use of the AcrySof Toric IOL Calculator (www.acrysoftoriccalculator.com) will allow the eye care practitioner to determine the appropriate power of the toric IOL as well as the axis.

EVALUATION BEFORE MARKING THE EYE

Verification of Data

It is helpful to bring a print out of the calculator's results to the OR to allow for preoperative verification of the axis and incisional location. The surgeon may wish to verbally verify the intended axis of orientation and have the scrub nurse use a marking pen to ink the toric marker and record the stated axis on the patient's sterile drape. Some surgeons tape the surgical plan to the wall or microscope, and others position the printout on the stretcher or floor oriented according to the operative eye with the patient supine.

Reference or Orientation Marks

During the preoperative examination, the surgeon can evaluate the patient's axis of astigmatism by using refraction, manual keratometry, automated biometry, and corneal topography. Each of these measurements is obtained with the patient seated and his or her head in a vertical position. Because the surgery is performed with the patient supine and his or her head in a horizontal position, it is important to have a mechanism that allows for appro-

prate marking despite the potential for cyclorotation.

How to Approach Cyclorotation-Induced Errors

Two broad methods address errors induced by cyclorotation. The first involves making a reference mark preoperatively while the patient is still seated to orient several cardinal degrees, or clock hours, of the limbus (eg, 3 o'clock, 6 o'clock, and 9 o'clock). This allows the surgeon to identify intraoperatively the location of the 180° and 90° axis as well as determine if any rotation has occurred. The second method, described later, involves using anatomic landmarks.

When a surgeon performs any marking, it is important to ensure that the patient's head is vertically positioned and perpendicular to the floor. This perpendicular orientation is also valuable when the surgeon attempts to verify the axis preoperatively.

The simplest type of reference markers allows the surgeon to place an orientation mark at one or more predetermined cardinal axes. When in the aforementioned position, the patient is asked to fixate on a distant target. The surgeon then brings the previously inked marker into the appropriate position at the limbus to mark the desired cardinal axis. These markers can be further refined with the addition of either a plumb bob weight or an actual bubble level. Both of these approaches help to ensure that the reference marks placed on the limbus are level.

The second approach to providing reference marks involves noting clearly identifiable limbal or iris landmarks

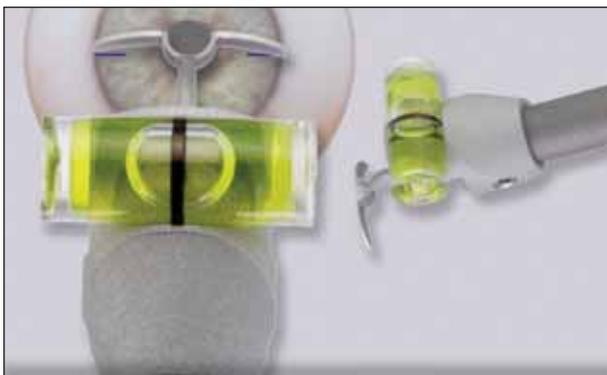


Figure 1. The Bakewell Bubble marker (Mastel Precision, Inc., Rapid City, SD). The level is superimposed on the eye.



Figure 2. Bonnie An Henderson, MD, using the Henderson Toric IOL marker (Katena Products, Inc., Denville, NJ).



preoperatively and recognizing the exact axis orientation of these marks when the patient's head is in a vertical position. Surgeons can achieve this by rotating the slit beam of most slit lamps and reading the axis directly off the lamp's tower. Surgeons can identify these anatomic landmarks when the patient is supine, thereby allowing surgeons to make any necessary adjustments to account for cyclorotation as the patient moves to a horizontal position. For example, suppose that based on the AcrySof Toric IOL Calculator, a surgeon desires to place an AcrySof Toric T5 IOL at 95°. Without a reference mark to determine the location of the 90° and 180° axis, surgeons would not be able to determine if any degree of cyclorotation has occurred. Preoperatively, if surgeons note at the slit lamp an iris nevus located at 2 o'clock or a peripheral corneal stromal scar at 6:30 o'clock, then these anatomic landmarks are used to reorient the toric marking intraoperatively.

PHYSICALLY MARKING THE LIMBUS

Most instruments used for marking the toric IOL axis have degree marks that can be oriented according to the previously placed reference marks. A simple marker consists of a complete circular ring with marks for the 360° inscribed on the surface. The surgeon then aligns the appropriate axis degree on the ring marker with the previously placed reference marks and then determines the location of any desired degree on the cornea.

Some of these markers contain an inner dial that can be rotated to the axis of implantation and, once ink is applied, they have the advantage of allowing the marking to be done single-handedly. One potential downside of this type of marker is that it can obscure the landmarks of the limbus and make it challenging to view the pupillary center (Figure 1).

The next type of marker uses a thin circular ring with

degree marks that can be placed over the limbal region and aligned with the previously placed reference marks. A second marker with this system is used that straddles the corneal dome and places marks at the desired axis of toric IOL implantation. This marker affords an excellent view of the anterior segment landmarks, however, it requires a two-handed technique (Figure 2).

Toric Marking and Axis Offset

Richard Mackool, MD, of Astoria, New York, has described a phenomenon that occurs during toric IOL marking that he explains as an *offset of the axis*. In this instance, toric marks are not placed at exactly the axis of desired implantation but are offset and placed parallel because of issues with parallax, visualization, or eye movement. In these instances, surgeons will not be able to rotate the IOL so that the toric marks are in alignment with those that have been placed. If the IOL is rotated so that the marks are parallel to the marks that were placed, then it will be left at the originally desired axis (Figure 3). It should be noted that this will only work when the marks that are placed are parallel to the intended axis and does not apply if the marks are placed obliquely to the intended axis.

In the past, many surgeons were reluctant to treat astigmatism at the time of cataract surgery because of concerns regarding variable and unpredictable responses with incisional techniques. At present, toric IOLs allow surgeons to reliably treat astigmatism at the time of cataract surgery with both short- and long-term predictability and precision that was heretofore not possible with incisional keratotomy and limbal relaxing incisions. By following a simple approach to online toric IOL power calculation coupled with basic steps for axis orientation and marking, the use of toric IOLs to correct astigmatism is well within the surgical domain of any ophthalmic surgeon performing cataract surgery today.

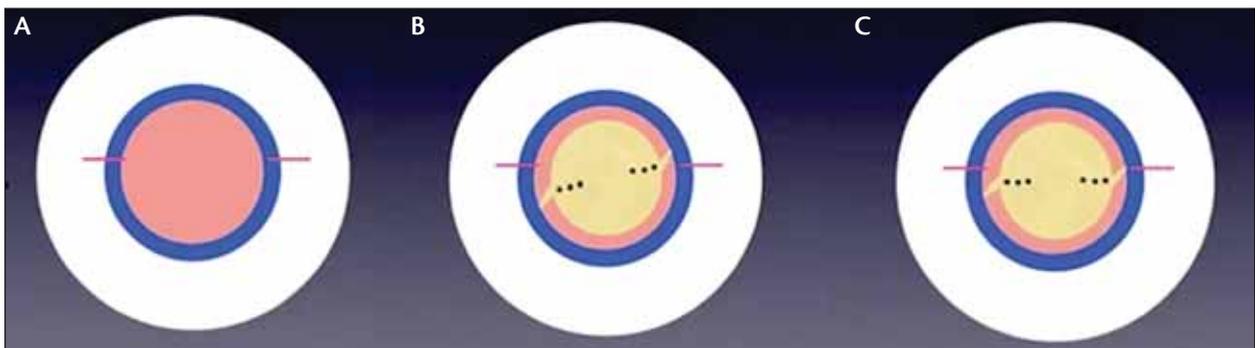


Figure 3. The two toric marks in red have inadvertently been placed superior to the intended 180° axis (A). The toric IOL is placed (B), but it is not possible to rotate the IOL so that the toric marks on the optic will align with the limbal toric marks because they are offset from the 180° axis. The IOL is rotated so that the toric marks on the optic are parallel to the marks that have been placed on the limbus (C). Even though the marks on the limbus are “offset” from the intended 180° axis, by rotating the IOL so the optic marks are parallel to the limbal marks, the IOL is left at the correct intended axis of 180°.



EXAMPLES OF AVAILABLE TORIC IOL MARKERS

**Accutome (www.accutome.com)
Devgan Axis Marker**

www.accutome.com/DevganAxisMarker

This tool marks preoperatively at the slit lamp by fitting into the tonometer's housing. It helps provide accurate outcomes by eliminating cyclotorsion and marking the center of the pupil. For more lasting marks, the anterior stromal puncture technique can be used, providing marks that last for a few weeks.



**Oasis Medical (www.oasismedical.com)
Elies Axial Marker from E. Janach (J2281.1)**

www.janach.it/azienda.asp?pag=azienda

This tool is for horizontal/vertical axis marking. It allows four preoperative marking points. To minimize errors in compensation, this product was developed to ensure a limbal mark on the horizontal axis (0° - 180°) by means of a pendulum swinging system. It can be used with the patient seated at the slit lamp and to determine the correct incision axis for intracorneal ring insertion.



**Crestpoint Management (www.crestpointmgt.com)
Cionni Toric Reference Marker, Cionni Toric Axis Marker
Manufactured by Duckworth & Kent Ltd**

www.crestpointmgt.com/incform.asp?Dept_ID=0&NavButton=07&Main=Y

The Cionni Toric Reference Marker (9-840) is used to mark horizontal and vertical reference meridians, used to further identify desired meridians for incision and IOL alignment. The Cionni Toric Axis Marker (9-841) is used to mark the incision and desired axis of the IOL.



**ASICO LLC (www.asico.com)
Graether's New Toric System**

www.asico.com/categories/?id=218

The Graether Axis Marker is part axis marker and part capsulorhexis marker. There is a 3-mm marking extension at 3 and 9 o'clock. It also has a unique notch at 6 o'clock to align with the axis, which is 90° off the point given by the toric calculator. It fits precisely in the degree gauge for perfect marking alignment. It can potentially be used as a preoperative marker.



**Katena Products, Inc. (www.katena.com)
Henderson Instruments**

katena.com/html/Search_Results.cfm

Designed by Bonnie An Henderson, MD, this set allows a surgeon to place two thin marks on the surface of the cornea along the axis of astigmatism for correct positioning of a toric IOL. The unique degree gauge (K3-7904), with internal cardinal notches and 5° compass lines, ensures the correct orientation to the patient's eye while the delicate blades of the marker (K3-7912) provide clear landmarks for precisely aligning the toric IOL.



**Mastel Precision, Inc. (www.mastel.com)
Bakewell Bubble Marker**

www.mastel.com/pdf/mastel.pdf

As toric IOLs are increasingly used, Mastel understands that positioning these lenses is critical for realizing the outcomes they provide. Mastel's toric IOL Kit demonstrates Mastel's answer to the need for precise toric IOL placement with clearly marked fixation rings and ultra-sharp, handfinished markers.

The BubbleLevel is a precision instrument that, when used properly, ensures exact axis location for LRIs and toric IOLs.





Differentiating Your Practice With Premium IOLs

Communication and coordination between eye care providers is a key to success.

BY JOHN RUMPAKIS, OD, MBA



Understanding how the public thinks is more important than ever to the success of the average eye care provider. Many practitioners believe that, with the prevalence of marketing messages today, the public has a basic understanding of all services and products available. Consumers are exposed to thousands of commercial messages per day in one form or another. These range from mind-numbing volume-pumped radio commercials to the easily skimmed and forgettable newspaper ads, billboards, and logos on the side of buses and buildings, not to mention the vast number of electronic and social media advertisements and promotions. It is estimated that the average American is exposed to more than 3,000 advertisements per day, adding up to approximately 1.1 million per year.¹

In a world saturated with marketing messages, the question becomes: *How can your advertising venues and communication materials significantly influence your practice?* You need to consider what services and products you are currently offering to your patients.

PREMIUM IOLs AND YOUR PRACTICE

Premium IOLs may be one of the largest driving forces within the ophthalmic market that we have seen in many years. As the technology improves and continues to provide significantly better outcomes, we practitioners have a tool to drive excitement back into our practices. That is, if you are willing to accept the fact that you must do something to perpetuate this excitement.

Remember, in 2006, the baby boomers started turning 60, one every 10 seconds. In 2011, the first wave of boomers will turn 65 and enter the world of Medicare.² On May 3, 2005, Medicare set forth a policy concerning the requirements for determining payment for insertion of presbyopia-correcting IOLs after cataract surgery.³ On January 22, 2007, Medicare set forth a policy concerning the requirements for determining payment for insertion of an astigmatism-correcting IOL following cataract surgery.⁴ These enforced policies by the Centers for Medicare & Medicaid Services created a new market within optometry and ophthalmology, specifically for patients seeking refrac-

Identify your potential patient base by mining records using tools that are already built into your practice management software.

tive correction. Furthermore, the new rules allow both surgeons and partnering physicians to increase profitability within their practices. Before this ruling, Medicare patients who needed cataract surgery were denied access to technology such as approved multifocal IOLs for astigmatism like the AcrySof IQ ReSTOR or the AcrySof IQ Toric lenses (both from Alcon Laboratories, Inc., Fort Worth, TX).

In addition, any extra tests and procedures specifically related to the correction of either presbyopia or astigmatism was not covered and was charged to the patient as an out-of-pocket fee. This also represented a change in policy and procedure. For instance, rather than send a claim directly to Medicare for payment, both optometrists and ophthalmologists must bill patients directly for these services and the noncovered component of the IOL itself.

These steps require even greater communication and coordination between eye care providers to achieve the best outcomes that premium IOL technology can deliver.

THE PROCESS OF COMMUNICATION

All of this means that if you plan to differentiate your practice by offering premium IOL services, you must first become familiar with the technology and outcomes. You must also develop innovative methods to communicate this new technology to eligible patients.

First, identify your potential patient base (eg, patients ≥ 55 years old) by mining their records using tools that are already built into your practice management software. Start parsing records by age and diagnosis and develop key lists of individuals you can educate about this technology.

Communicating with your patient base is not a single event but a process. It requires that you develop a well-



INCORPORATING PREMIUM IOLs INTO PRACTICE: DO THE MATH

Making patients aware of premium IOLs can be financially rewarding. Many comanaging physicians are simply not aware that the Centers for Medicare & Medicaid Services' rules stipulate that they can set their fees independently based upon the service provided in addition to charging the patient directly for the procedures related to the multifocal or toric aspect of IOL correction. These procedures and services include any preoperative testing and postoperative care that is supplied in excess to what would be made available in terms of traditional monofocal IOL care.

On average, the comanaging physician charges approximately \$400 to \$700 per eye for services specifically related to the multifocal or toric aspect of the IOL. Keep in mind that this is in addition to the Centers for Medicare & Medicaid Services' reimbursement for the comanagement of the traditional monofocal IOL aspect of patient care. Always recognize the financial relationship between you and the patient and clarify what is expected from each party. In most cases, the patient will be writing three checks: one to the ASC, one to the surgeon, and one to the comanaging physician (if different than the surgeon) for payment of his or her respective procedure to prevent the comingling of funds.

Premium IOLs are not only great technology to offer patients but can have a significant impact on your practice as well.

Financial Impact of Incorporating Premium IOLs Into Your Optometric Practice

Example scenario:

- Refers eight eyes for cataract evaluation per month
- Educates all patients on IOL option
- 20% conversion rate to premium IOLs
- Two eyes are both candidates and elect to upgrade their IOL to a ReSTOR lens
- Eight eyes postop 90 days with Medicare $\$140 \times 8 = \$1,120$
- \$2,895 ReSTOR lens cost to patient
- \$895 ASC for cost of lens
- \$400 — 20% comanagement fee to optometrist for additional care of the premium lens patient
- \$1,600 to surgeon for premium lens surgeon fee

Over 12 months, this optometrist could make an additional \$9,600 for converting 20% of patients to premium IOLs.

crafted, finely tuned message that delivers the essential information that the patient needs to take away. Always communicate with an end goal in mind; then practice, rehearse, refine, and repeat your message several times. Next, educate and train your staff to deliver the same points but in their own words and from their perspective. Communication from the office to patients should be congruent, well thought out, and precisely delivered at every encounter. If you do this well, you will have differentiated yourself and your practice from the vast majority.

Communicating with your patient should not be difficult; it is as simple as listening to them. Listening is the most important communication skill that you possess, but remember to pay attention with more than just your ears. Take note with your eyes as well. It has been stated that body language and tone of voice account for 93% of what a listener absorbs, not the words being said. When you communicate your message, be wholly invested in the time you are spending. Patients value the quality of the time spent more than the quantity. The bottom line is that you need to develop a quality personalized mes-

sage, deliver it well, and be genuinely invested in the patient.

Medical technology is advancing at a rapid pace. These developments within the premium IOL market have provided us with tremendous options and solutions for our patients. The collision of technology and market demographics is a wonderful place to be when you are prepared. Understanding what IOL technology can deliver, and more importantly, clarifying the process of communicating the benefits and options to your patients, is the key to reaping the benefits.

Although differentiating your practice is not difficult, it does not occur by accident. Patients do not care about how much you know until they know how much you care. ■

1. Google answers. Q: American advertising in the media. <http://answers.google.com/answers/threadview?id=56750>. Accessed July 25, 2010.
2. Baby Boomer Headquarters. www.bbhq.com. Accessed July 26, 2010.
3. CMS Rulings. Department of Health and Human Services. Centers for Medicare & Medicaid Services. Ruling No. 05-01; May 3, 2005. <https://www.cms.gov/Rulings/downloads/CMSR0501.pdf>. Accessed July 25, 2010.
4. CMS Rulings. Department of Health and Human Services. Centers for Medicare & Medicaid Services. Ruling No. CMS-1563-R; January 22, 2007. <http://www.cms.gov/Rulings/downloads/CMS1536R.pdf>. Accessed July 25, 2010.

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