

ASCRS Clinical Survey reveals laser vision correction clinical practices and looks to the future

by John Vukich, MD



Twenty percent of ASCRS members who perform laser vision correction (LVC) do not have a standardized method to assess successful outcomes, according to results of the 2015 ASCRS Clinical Survey (Figure 1). When assessing successful outcomes, 43% consider patient satisfaction and 65% consider a visual acuity of 20/20 or better a successful outcome.

In today's clinical environment, however, 20/20 vision is only part of the equation. Patients have higher expectations that have to be met for them to feel satisfied with their outcome.

Survey objectives

Compiling responses from more than 2,000 unique respondents, the 2015 ASCRS Clinical Survey was conducted to learn more about members' clinical opinions and practice patterns, drawing 485 data points from 174 questions. This annual survey examines the current state of affairs and directs future ASCRS education efforts.

When respondents were asked which ablation type accounted for the majority of their corneal refractive procedures, 52% responded wavefront-guided ablation, but only 44% reported that it will account for most of their corneal refractive procedures in 2 to 3 years. This change probably results from respondents' installed base of equipment and competition from other platforms.

- How are you currently assessing successful laser vision correction surgery outcomes in your practice? (Select all that apply)
- 20% of respondents don't have a standardized way of assessing outcomes
- 65% use UCVA of 20/20 or better

	% All
We don't have a standardized way of assessing outcomes	20%
Uncorrected visual acuity – we look at the percent of patients with 20/20 or better UCVA	65%
Uncorrected visual acuity – we look at the percent of patients with 20/16 or better UCVA	17%
Ratio of patients with postop UCVA > preop BCVA	15%
Patient satisfaction ratings	43%
Visual quality contrast sensitivity testing	9%

Figure 1. ASCRS members indicated how they assess successful LVC outcomes in the 2015 Clinical Survey.

- What percentage growth or decline do you think will occur in your annual laser vision correction procedure volumes in the next 12 months?
- 37% think there will be more than 10% growth

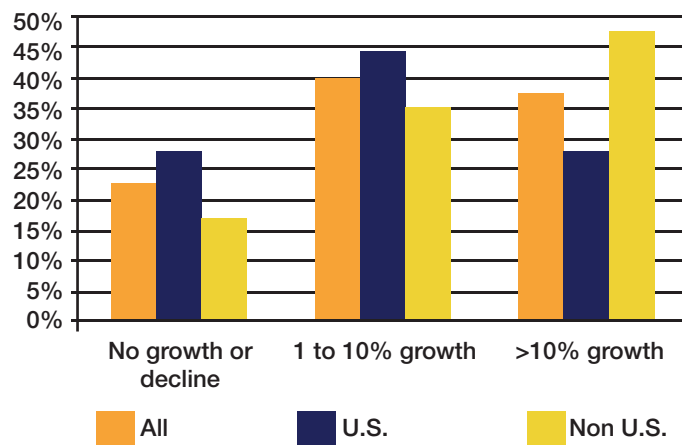


Figure 2. Survey respondents shared their expectations regarding future growth or decline of laser vision correction procedures in their practice within the next 12 months.

The impact of exceeding 20/20: achieving patient satisfaction and practice growth

by David Hardten, MD



Advanced laser vision correction technology and improved measurement standards can help increase patient satisfaction

To achieve success with laser vision correction (LVC), surgeons need to exceed patients' expectations and reach beyond 20/20. Topography-guided and advanced wavefront-guided technology and new measurement standards can help surgeons attain the outcomes patients expect.

Achieving patient satisfaction

Our patients' results—including their experiences, visual outcomes, and overall satisfaction—drive patient-to-patient referrals, which are key to LVC practice growth (Figure 1).

Even as we refine our outcomes, however, postoperative assessments may not reflect results that exceed 20/20. When evaluating patients after LASIK, ophthalmic technicians often are trained to stop measurements at 20/20, but we must ask them to measure 20/15 or 20/16 outcomes.

In our assessments, we also can calculate the ratio of postoperative uncorrected distance visual acuity versus corrected distance visual acuity, evaluate contrast sensitivity, and examine patient satisfaction surveys.

Research has shown that patient satisfaction is highly correlated with uncorrected visual acuity (UCVA), and

Drivers of patient referrals

- **Results:**
 - Patient experience
 - Visual outcomes
 - Overall satisfaction
- **Results driven by:**
 - Technology
 - Assessments of successful outcomes

Figure 1. Drivers of patient referrals include patient experiences, visual outcomes, and overall satisfaction.

Latest wavefront-guided LASIK

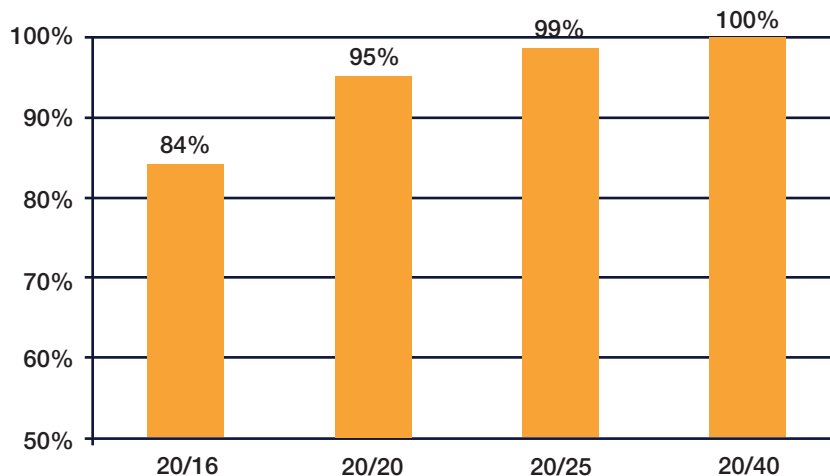


Figure 2. Monocular 1-month postop UCVA after latest wavefront-guided LASIK in 8,905 eyes

Figure courtesy of Steven Schallhorn, MD

we need to achieve excellent UCVA during the initial surgery.^{1,2} It is not uncommon that patients are disappointed with 20/20 UCVA. Although we may perform enhancement surgery to increase patient satisfaction, we do not want an enhancement rate of 6% or 7%, which breaks down satisfaction rates and increases costs and frustration.

Patient satisfaction is negatively correlated with postoperative visual disturbances, and the most common cause is residual refractive error. Patient satisfaction also is negatively correlated with ocular symptoms, so we need to

aggressively manage dry eye and ocular surface irritation.

Mean satisfaction is a function of UCVA. According to monocular data from **Steven Schallhorn, MD**, from Optical Express, 70% of patients were pleased with 20/20 UCVA 1 month after surgery, but 81% were very satisfied with 20/16 UCVA and 87% were very satisfied with 20/12 UCVA.

As vision surpassed 20/20, moving from 20/16 to 20/12, patients were more likely to refer others to the practice that performed the procedure.

“Research has shown that patient satisfaction is highly correlated with uncorrected visual acuity”

—David Hardten, MD

Advanced technology

Topography-guided and advanced wavefront-guided technology will help surgeons achieve better outcomes.

In a primary myopia trial, results 3 months after surgery with a topographic-guided ablation system were as follows: 92.7% had 20/20 or better UCVA, 68.8% had 20/16 UCVA, and 29.6% gained at least 1 line of best spectacle-corrected visual acuity.³ Visual symptoms such as glare and halos also improved after surgery.

When Dr. Schallhorn assessed results of advanced wavefront-guided ablation (iDesign, Abbott Medical Optics, Abbott Park, Ill.) in more than 8,900 eyes with a broad range of astigmatism and myopia

(more than 4,700 patients), 84% had 20/16 UCVA and 95% had 20/20 UCVA 1 month after surgery (Figure 2). Although we have not achieved 20/16 in 100% of cases, I think each technology advancement improves our results.

These data compare favorably to those achieved with topography-guided ablation. I think the difference between 20/20 and 20/16 results from higher order aberrations, not necessarily sphere and cylinder. I think we will achieve 20/16 vision correction when we control those higher order aberrations.

Conclusion

The future is beyond 20/20, and advanced technology will help us deliver

these results. However, if we do not measure 20/16 outcomes, we will never know whether we are achieving them.

Assessing these clinical parameters will help us determine our outcomes and drive patient satisfaction—as well as practice growth.

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Dry eye remains a concern of patients considering LVC. The ASCRS Clinical Survey reported that respondents think LASIK has significantly increased the level of postoperative dry eye in 30% of their patients 6 months after LASIK.

Future growth

The survey determined that nearly half (46%) of LVC surgery is driven by patient-to-patient referrals. Although surgeons may focus on marketing, optometric referrals, and other options, close to half of our cases are derived from word-of-mouth referrals. We need to take a closer look at how we can encourage satisfied patients to be our advocates.

When respondents estimated their LVC procedure volumes in the next 12

“We need to take a closer look at how we can encourage satisfied patients to be our advocates.”

—John Vukich, MD

months, 37% anticipated more than 10% growth (Figure 2). Growing these numbers will take effort and energy.

In the following pages, LVC experts will share their insights on emerging technology, strategies to achieve optimal outcomes, and clinical and marketing

tips to leverage LVC in your practice. *Dr. Vukich practices with Dean Medical Center in Madison, Wis. He can be contacted at javukich@gmail.com.*

Emergence of new laser vision correction technology

by Edward Manche, MD



“Advanced wavefront-guided ablation and topography-guided ablation offer an unprecedented level of customization.”

—Edward Manche, MD

High-definition wavefront-guided ablation and topography-guided ablation offer new opportunities for customization

Although most refractive surgeons currently use wavefront-guided or wavefront-optimized systems, emerging technology will offer patients opportunities for higher-quality vision. Tomorrow's procedures will be performed with high-definition wavefront-guided and topography-guided ablation, providing an unprecedented level of customization.

The goal of wavefront-optimized technology is to avoid changes in corneal asphericity by placing increased pulses in the periphery. Treatment is based on the manifest refraction and corneal

curvature. In contrast, wavefront-guided technology is designed to reduce or eliminate the induction of higher order aberrations, based on wavefront maps.

Advanced wavefront-guided ablation, based on wavefront maps, is designed to meet the same goals as wavefront-guided procedures—reducing or eliminating induction of higher order aberrations. However, because it has increased resolution and registration capabilities, we can image highly aberrated eyes and better image virgin eyes.

Topography-guided treatment is designed to produce a detailed map of the cornea shape and power and create a treatment pattern to regularize it.

Advanced wavefront-guided ablations

The newer high-definition wavefront-guided technology is proven. **Steven Schallhorn, MD**, and his colleagues at

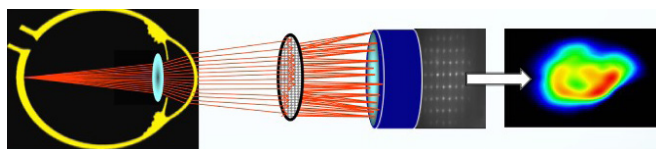
Optical Express have been using it to obtain exceptional results for a number of years outside the U.S.

The high-resolution iDesign (Abbott Medical Optics, Abbott Park, Ill.) allows surgeons to image highly aberrated eyes with very good precision for keratoconic eyes and eyes with previous incisional refractive surgery and irregular ablation profiles.

The improved spot quality reduces spot crossover effect. The high-resolution system offers the ability to capture more patients, improved detection of higher order aberrations, and better wavefront reconstruction for treatment, both in virgin eyes and highly aberrated eyes.

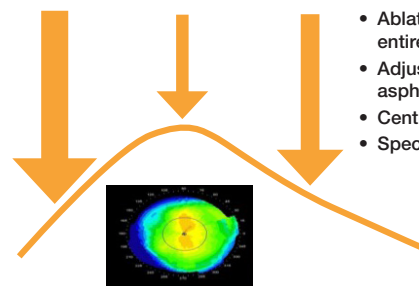
It provides an improved ablation profile based on whole eye optical aberrations, with a higher-quality aberrometer, increased dynamic range, more precise torsional alignment, and corneal curvature compensation (Figure 1).

Advanced wavefront-guided technology



- Improved ablation profile based on whole eye optical aberrations
- Higher-quality aberrometer
- Increased dynamic range
- More precise torsional alignment
- Corneal curvature compensation

Topography-guided ablation and corneal aberrations



- Ablation profile based on the entire corneal shape
- Adjust postop corneal asphericity
- Centration control
- Specify refractive correction

Figure 1. The advantages of advanced wavefront-guided ablation

Figure 2. Topography-guided ablation used to treat corneal aberrations

Experiencing the significant impact of LASIK versus surface ablation

by Steven Schallhorn, MD



“Surface ablation plays a key role in treating specific patients, but misperceptions, including concerns about dry eye, may drive surgeons to choose PRK over LASIK.”

—Steven Schallhorn, MD

Surgeons may have misperceptions regarding the value of surface ablation in particular cases

For a segment of our refractive surgery patients, concerns of dry eye may influence surgeons to choose surface ablation over LASIK.

While it may come as no surprise that patients who have LASIK have a higher satisfaction rate early after surgery and faster visual recovery, there are less, not more, dry eye issues with LASIK. Therefore, some may wonder whether we are being overly cautious in opting for

PRK and whether we are maximizing the benefits of LASIK.

Visual acuity

We recently conducted a retrospective study of 1,007 patients (1,846 eyes) who had PRK and matched them to 22,866 patients (44,475 eyes) who underwent LASIK.

When we examined the percentages of patients achieving 20/16 uncorrected distance visual acuity (UCDVA), patients who had LASIK showed a clear

visual advantage in the early postoperative weeks (1 day postop, 72% of those having LASIK had 20/16 UCDVA vs. 9% of those with PRK; 1 week, 78% of those with LASIK vs. 36% of those with PRK; 1 month, 84% of those with LASIK vs. 63% with PRK). Three months after surgery, 20/16 UCDVA was achieved in 85% of those having LASIK versus 83% of those having PRK.

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Topography-guided ablations

Topography-guided corrections combine corneal topography with manifest refraction, using Placido disk and Scheimpflug technology. The system measures 22,000 to 25,000 elevation points, and the ablation profile is based on the entire corneal shape (Figure 2). The surgeon can specify centration, adjust postoperative corneal asphericity, and choose the desired refractive correction.

One advantage of this system is that surgeons are familiar with topography. It is not influenced by accommodation or centroid shift. We can also consider angle kappa.

It is designed to address corneal aberrations exclusively in primary eyes

and therapeutic cases. It can be used in cases where the corneal aberrations are too high for accurate wavefront capture or in circumstances where the surgeon would not want to use wavefront-guided ablation, especially with older wavefront systems or in cases with previous corneal surgery such as penetrating keratoplasty, corneal scars, and keratoconus in conjunction with collagen crosslinking.

Unmatched customization

Advanced wavefront-guided ablation and topography-guided ablation offer an unprecedented level of customization. I have seen a number of patients with highly aberrated eyes who have been treated with topography-guided ablation

to regularize their corneas. Six months later we imaged and treated them with wavefront-guided ablation to treat the remaining refractive error and have achieved excellent refractive outcomes.

These higher-resolution diagnostics deliver higher-quality vision in virgin and highly aberrated eyes. The next step is to adopt this technology and define measurement standards to achieve these results.

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Typical case management with wavefront-guided technology

In a typical case, we performed wavefront-guided LASIK on a 29-year-old lawyer who works in medical-legal claims. In his spare time, he runs in marathons and plays squash. He typically wore daily wear contact lenses, occasionally leaving them in overnight.

I think LASIK is a safer option in the long run than wearing contact lenses, especially if the contact lenses are left in overnight. His motivation for LASIK was to reduce his dependence on glasses and contact lenses.

His uncorrected vision was 20/200 in each eye. His manifest refraction was: right, $-2.75 -0.50 \times 015$, best corrected visual acuity (BCVA) 20/12.5; left $-2.75 -0.25 \times 080$, BCVA 20/12.5. His low light pupil diameter was 6.5 mm in both eyes. Figures 1 and 2 show the treatment plan.

The patient commented that the surgery was pain free and quicker than expected and that he saw results immediately. He reported that his eyesight is "fantastic." One month after LASIK, the patient was very satisfied. His uncorrected distance vision was 20/12.5 in each eye. His manifest refraction was: right, $+0.50 -0.50 \times 005$; left, $+0.25 -0.25 \times 160$.

This case demonstrates the effectiveness of the latest technology.

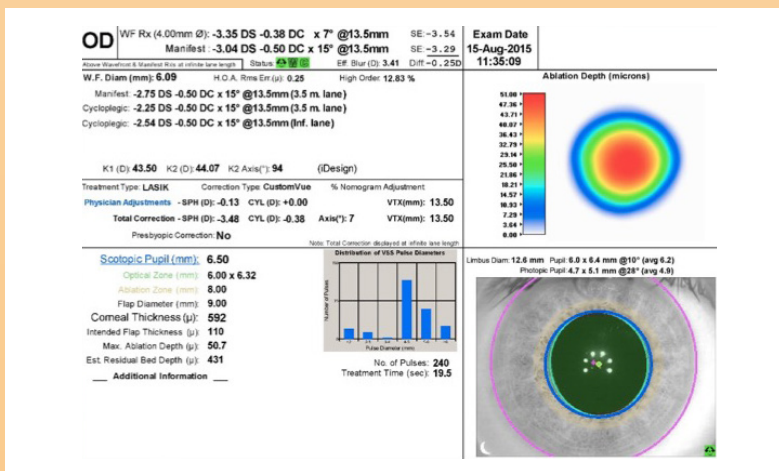


Figure 1. Treatment plan for right eye

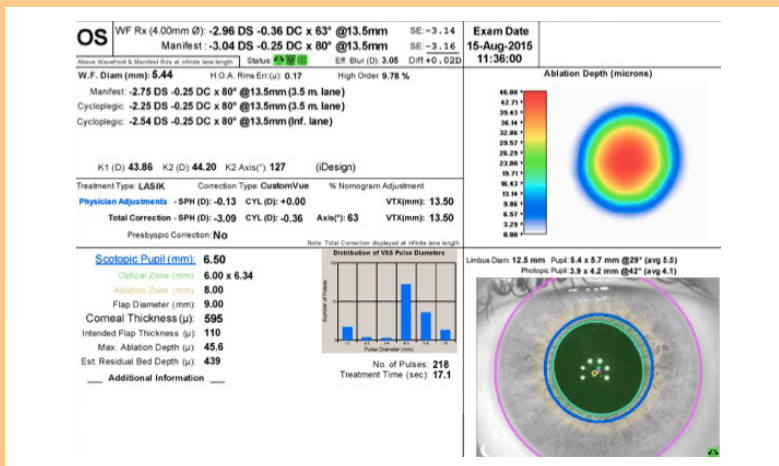


Figure 2. Treatment plan for left eye

This was also the case when we looked at the percentage with 20/20 UCDVA (1 day postop, 90% of those having LASIK had 20/20 UCDVA vs. 23% of those with PRK; 1 week, 93% of those with LASIK vs. 61% of those with PRK; 1 month, 95% of those with LASIK vs. 84% with PRK). Three months after surgery, 95% of both groups had 20/20 UCDVA.

Additional results

Patients who had LASIK compared with PRK were more likely to be satisfied 1 month after surgery (93% vs. 84%, respectively), but percentages were almost equal 3 months after surgery (92% vs. 91%, respectively).

When patients were asked about dry eye symptoms during the previous week, 85% of patients who had LASIK compared with 79% who had PRK reported no discomfort 1 month after surgery. Three months after surgery, 90% of those who had LASIK versus 87% of those who had PRK indicated no dry eye issues.

Conclusion

Surface ablation plays a key role in treating specific patients, but misperceptions, including concerns about dry eye, may drive surgeons to choose PRK over LASIK.

In addition, LASIK may be more beneficial economically in our practices without compromising patient care.

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Expanding with innovation

by Mark Kontos, MD



To grow their laser vision correction practices, surgeons need to develop strategies to increase patient-to-patient referrals

Although external marketing plays a role in growing your laser vision correction (LVC) practice, patient-to-patient referrals are key in fueling practice growth.

When LVC first became popular, people talked about it at social events, and everyone was eager to hear about it. However, LVC is now a common procedure, and the “wow factor” is no longer the same.

We will see the market grow when patients become excited about LVC again. To reignite enthusiasm, our top priority is to deliver extraordinary visual outcomes. We also need to meet the needs of our changing target populations.

Targeting millennials

As we look to the future, it will be important to tap into the huge millennial population early (Figure 1).

One of the reasons I think LVC volumes have declined is that contact lenses have become more comfortable and affordable and provide excellent vision. However, there are risks associated with contact lens use that may motivate patients to consider LVC.

To appeal to millennials, we need to keep in mind that they are particular, and they are very savvy and smart. They have a wealth of information at their

Millennials

- Outnumber boomers by 11M
- Peak age in U.S. population is 22
- By 2020, 1 in 3 adults will be a millennial
- Underemployed
 - Entered workforce in a recession
- Optimistic

Figure 1. Snapshot of the millennial generation

fingertips on their phones. As we talk to them, they can pull up a comprehensive list of potential complications in an instant or other relevant data. We need to be ready to answer their questions and spend the time they require.

Because millennials do not like to wait, we have shortened our postoperative visits and eliminated 2 visits. I now see patients the day after LASIK and 2 weeks later unless there is a problem, although the schedule is different for PRK.

Traditional marketing efforts generally do not resonate with millennials because they may not read the newspaper or watch television news. They get most of their information from their phones. They also use Instagram and other social media and prefer videos that appear raw and amateurish, rather than slick and professional. To keep up with changing social media habits, we have a staff member who tracks platform use and manages our web presence.

Social benefit programs also appeal to this generation. For example, in one promotion we donated a portion of the fee for each LASIK procedure to a company that provides loans to help people in developing countries launch businesses. That resonated with most patients.

Our practice design also influences patients. For instance, our reception area is more likely to appeal to baby boomers rather than millennials because we were targeting that demographic when we planned it. We will need to make changes that will make this environment more welcoming for younger patients.

Driving growth

Cost may deter patients from pursuing LVC, but not as much as it used to. Fear is also an issue, but I think we can modulate those fears by using advanced technology and working diligently to obtain exceptional outcomes.

Word-of-mouth referrals are essential in generating growth, but we need to get patients to talk about their surgery early. Patients tend to stop talking about it a few weeks later. Many of our referrals also come from optometrists, so we need to be responsive to the optometric community.

To promote interest, surgeons should update patients on technologic advances that can translate into better outcomes.

When weighing LVC options, I think most millennials appreciate a quality practice. We need to emphasize our experience, integrity, and commitment to excellence, creating the type of environment they seek.

Conclusion

As we develop LVC practice growth strategies, the approaching millennial generation will play a major role in our future. To target this group most effectively, we strive for superior outcomes, consider nontraditional marketing approaches, and engage in open conversations with millennials about LVC.

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Leveraging laser vision correction in your practice

by Steven Dell, MD



In growing their practices, surgeons need to target patients at both ends of the age range

As we build our laser vision correction (LVC) practices, we need to look ahead to how we will target millennials but recognize that we cannot live by this generation alone.

Because it will be some time before this massive population accounts for the meat of the LVC age zone, we need to appeal to patient populations at both ends of the age spectrum.

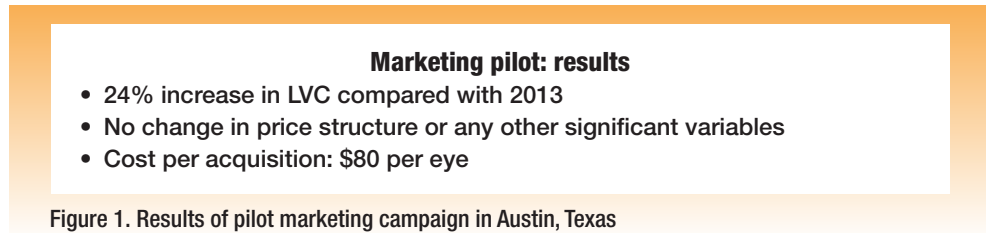
Understanding the market

LASIK volumes are at historic lows, possibly at one-third of the 1.2 million cases performed at peak.

In looking ahead, we need to think differently about many of our patients' visual tasks. There is now greater emphasis on near vision with cell phones and laptop computers. As near vision requirements increase, they are influencing premium intraocular lens choices as well as LVC decisions.

For surgeons who perform refractive and cataract surgery, it can be challenging to appeal to both 25-year-olds and 65-year-olds because they have different concepts of luxury, professional competence, authority, and technology.

Although we understand the needs of baby boomers, we may not be as familiar with millennials. Having entered the workforce during a recession, members of this generation tend to



be underemployed. However, they are likely to be optimistic. They also demand transparency and research potential procedures on the Internet.

In addition, because they prefer not to wait to make appointments, it may be helpful to provide online scheduling and Saturday and evening appointments. To minimize inconveniences associated with LVC, we have eliminated 1-week postoperative appointments after LASIK. We see patients 1 day and 1 month after surgery.

Engaging potential patients

Although baby boomers may have responded to television, radio, newspaper, and billboard advertising, these strategies are unlikely to attract millennials.

I practice in Austin, Texas, which is a very competitive market. Last year Abbott Medical Optics (Abbott Park, Ill.) conducted a 7.5-month pilot marketing campaign in Austin, which was 1 of 3 markets, using banner ads, paid search, Facebook, and Pandora to drive people to practices that used Abbott Medical Optics technology.

During this period, we saw a 24% increase in LVC compared with 2013, in contrast with the national trend where LVC declined by approximately 6.6%. We did not change our price structure or any other significant variable (Figure 1).

The cost to acquire a patient was very low—approximately \$80 per eye. Therefore, we continued this marketing approach.

Consumer research

Abbott Medical Optics conducted a consumer research study in 2014 to determine why people chose not to have

LASIK, polling 1,200 recent patients (considerers and non-considerers).

Patients tend to be more driven by functional needs than aesthetics.

Fear was the top barrier to LASIK. In addressing this, we need to better understand patients' fears (fear of vision loss vs. dry eye or halos). Cost was a second concern.

Through patient education, we can correct misconceptions such as the myth that LASIK "wears off." Patients need to realize that when a 58-year-old who had LASIK at age 39 cannot read close up, it is because of lenticular function rather than a change in the cornea.

Patient-to-patient referrals were most likely to influence decisions. Satisfied patients tend to refer approximately 7 friends or family members.

Patients also were motivated by their optometrists' recommendations.

Respondents were not aware of new advances in technology. When we talk about the iDesign system (Abbott Medical Optics) with our patients, we can explain that this is a true improvement over previous technology.

Conclusion

Millennials are a sweet spot for LVC, but it is a bit too early for them to meaningfully impact our numbers. We need to appeal to both ends of the age spectrum. When surgeons reach out to millennials, they should consider nontraditional, very transparent approaches to increase their interest.

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