This is the second in a series of articles that highlights results from market studies on topics of interest to refractive surgeons. These studies comprise original research conducted by SM² Consulting of Pleasanton, California.

Refractive surgery has evolved beyond the era when it was defined by a single procedure such as RK and then LASIK. Today, there are laser and non-laser corneal treatments and the first of many IOLs for lenticular treatments. Conductive keratoplasty is one procedure in the refractive arsenal that has struggled to find its best fit in the ophthalmic practice. Among refractive surgeons, opinions seem to vary widely regarding the procedure’s utility and whether or not investment in it makes sense. In mid-2004, the manufacturer of the Viewpoint CK device, Refractec, Inc. (Irvine, CA), launched a refinement to its CK technique called Lighttouch, which involved using less forceful compression with the radio-frequency delivery tip. As a product upgrade, Lighttouch was expected to offer a significant improvement in outcomes and patient satisfaction.

Refractec, Inc., asked SM² Consulting to independently interview a group of surgeons from its user base to better understand current attitudes toward the CK procedure—especially Lighttouch—and its ongoing role in refractive surgery.

**METHODOLOGY**

My staff and I developed a set of research objectives, a discussion guide, and data-collection processes, and we conducted research interviews from a sample of 20 practices currently using the CK with Lighttouch technique. The practices represented a wide distribution by geography and practice type. Most of the surgeons we interviewed had been using the CK device for several years (mean = 2.6 years), with a range that included a relatively new user (3 months) and two of the original clinical investigators (7 years’ experience each). Questions focused on users’ current clinical experience with CK, with the additional goal of understanding patients’ motivation and management with this procedure. We also collected data on the practices’ recent refractive procedural volume and pricing to understand where CK fits economically within them. Finally, we conducted additional interviews with three corneal specialists to discuss emerging therapeutic uses of CK (see the sidebar, Refractive Rescue).

**CLINICAL OUTCOMES AND USES**

Without question, the Lighttouch technique is allowing CK to produce better results today than it was a year or more ago. Eighteen of 20 surgeons had experience with both the new and original techniques and could draw direct comparisons between the two treatment methods. Lighttouch offers the surgeon the ability to treat with fewer spots in a single ring placed farther outside the optical zone. The technique achieves a greater refractive effect and nearly eliminates the induced cylinder observed postoperatively with the conventional CK method. These improved results have led to a much higher degree of surgeon confidence in the procedure. As Figure 1 shows, confidence on a 10-point scale was heavily weighted toward the high end of the scale. No surgeon placed his confidence below a 7.
TODAY'S PRACTICE

scale received an average score of 8.6, with no surgeon rating his confidence in the procedure below a 7. Many surgeons remarked that this sentiment is much higher than what they would have expressed if asked this question a year ago.

All 20 surgeons said that their primary use for the procedure is with plano presbyopes, whereas only 30% of them indicated using it with mild hyperopes (Figure 2). This is a dramatic shift between the procedure’s first indication (for hyperopia) and the more recent approval for presbyopic treatment. Additional uses included LASIK refinement (55%) and IOL refinement (25%).

RETURN ON INVESTMENT—TODAY

We analyzed the return on investment to understand whether Refractec’s Viewpoint CK device could indeed pay for itself in a typical practice. Surgeons provided data on procedural volume and pricing for the first quarter of 2005. As Figure 3 shows, the largest subgroup of surgeons performed between 20 and 49 CK procedures during the quarter. The average number of eyes treated with CK by all the surgeons was 32, and the median number of eyes treated with CK was 18.6 during the quarter. The more conservative average is preferable given the wide range of procedural volumes (0 to 120 eyes treated). We found no correlation between CK and LASIK volumes. The highest- and lowest-volume CK surgeons interviewed were also the highest-volume LASIK surgeons in this sample. Importantly, surgeons also indicated that their CK volumes are increasing rapidly due to their improved results with the Lighttouch technique.

The average collected fee per CK treatment was $1,637 (range: $1,250 to $2,000), and treatments were typically unilateral. Using these figures, treating two eyes or more per month justifies the cost of the
Viewpoint CK device, and all but one of the surgeons interviewed met this criterion.

**SPILLOVER EFFECT**

Although not directly measured, surgeons also indicated that CK is effective at building their LASIK procedural volume. Sixteen of the 20 surgeons interviewed conduct external marketing for their services and, on average, 22% of their budgets is devoted to CK. This boost in overall volume makes sense, as news stories and advertising about any visual-performance treatment are likely to generate interest in all refractive procedures. Anecdotally, surgeons noted that inquiries about CK often lead to LASIK procedures, and vice versa.

**FUTURE BUSINESS**

One surprise finding in this survey was the essential role that CK played as part of a strategy to secure future IOL business. For surgeons with a long-term view of growing their refractive businesses, offering CK provides a means of establishing a relationship with patients who would otherwise not seek surgical treatment for another 10 to 15 years. By leveraging the less invasive (and less expensive) aspects of this procedure relative to a refractive IOL, CK allows the surgeon to form a bond with patients and begin a dialog that will continue years later.

The surgeons in this study also reported that many patients who are attracted to CK (1) have never been under the care of an eye doctor, (2) have been told that there was nothing that could be done for their presbyopia (and sent to the drugstore for some inexpensive reading glasses), or (3) are too fearful to consider LASIK, much less an IOL implant. Thus, CK becomes an entry point for these patients by which to ease into eye care services.

![Figure 3. This graph shows the number of CK eyes treated in the first quarter of 2005.](image-url)
Corneal specialists David Hardten, MD, of Minneapolis, Minnesota; Peter Hersh, MD, of Hackensack, New Jersey; and Marc Michelson, MD, of Birmingham, Alabama, shared their perspectives on the therapeutic uses of conductive keratoplasty (CK; Refractec, Inc., Irvine, CA) and its emergence as an essential tool for the corneal surgeon.

Dr. Michelson acquired his Nearvision CK device (Refractec, Inc.) just after the FDA approved it for refractive procedures. He quickly realized that it could be an ideal tool for managing corneal astigmatism. With the ability to change the cornea's shape within 0.6 seconds, he began correcting irregular astigmatism of all causes, including trauma, the cataract wound, and previous refractive surgery “gone bad.” Dr. Hersh concurred. He has been using CK heavily with post-LASIK patients who are still unhappy after multiple enhancements. “All corneal surgeons need this as an adjunctive tool,” commented Dr. Hersh. “Not having CK available is like not having the ability to put in a compression suture.”

All three specialists said they appreciate the “instantaneous fix” radio-frequency energy creates when applied to the cornea. Therapeutic CK offers an immediate visual improvement and fast recovery with no discomfort. “This is truly appreciated by patients, many of whom are desperate for even a slight improvement in acuity or image quality,” remarked Dr. Hardten.

The Nearvision device’s handheld probe allows more precise, localized use on the cornea relative to an excimer laser, said Dr. Hardten. Although not as titratable as the excimer laser, the CK procedure has the benefit of simply contracting or molding corneal tissue, which is of high value when tissue is at a premium. This level of versatility has enabled Dr. Hardten to use the procedure after penetrating keratoplasty, after RK, and in keratoconic patients who are not appropriate candidates for other forms of refractive surgery.

The physicians agreed that corneal topography helps them plan and reconcile therapeutic CK cases. Additionally, the intraoperative assessment of keratometry and a reflected ring light or placido disc provides guidance in placing the treatment spots. Dr. Hersh noted, “The surgeon should define an endpoint to the procedure in the preoperative plan.”

**Art Versus Science**

All three surgeons commented that therapeutic CK procedures demand a high degree of artistry. “CK requires far more thought and technique than LASIK,” said Dr. Hersh. Dr. Michelson likened the approach to “fighting fire with fire”: to treat astigmatism with CK, one has to create an opposite effect of equal strength. Yet, the outcomes their CK patients are achieving make the extra time worthwhile. The three reported that the procedure allows them to resolve a lot of patients’ visual complaints.

Surgical goals with the procedure are more conservative than those of a primary surgery, including the recovery of BCVA, the removal of ghost images, and the ability to again wear contact lenses. CK involves the selective application of low-level energy spots at 8 to 9mm from the visual axis, a safety profile that carries virtually no downside.

**Gaining Experience**

Dr. Michelson is now analyzing the results from 250 therapeutic CK cases with 2 years of follow-up in preparation for publication. Dr. Hersh will present data from 150 eyes at this year’s AAO meeting in Chicago. Dr. Michelson summed up what is on the horizon: “Therapeutic CK is an undiscovered and invaluable tool that most surgeons don’t know about yet. We are just scratching the surface of this tool and how much it can help us help our patients.”

**Appealing to CK Candidates**

The patient who wants CK is not likely to be found in the waiting room of a typical ophthalmologist’s practice. Rather, he fits somewhere between the typical LASIK patient (younger, myopic, has not enjoyed unaided vision for years) and the typical IOL patient (older, has other age-related health issues). Many patients who choose CK have never had a relationship with an eye care professional and only now need visual help. Blessed with good distance vision all their lives, they reach their late 40s to find themselves increasingly frustrated and even angry at their inability to perform near and intermediate visual tasks. Such frustration can be classified in the context of the physical and emotional toll of getting older. In addition, many feel that there is nothing aesthetically redeeming about wearing reading glasses. The CK candidate comes in saying, “I look and feel old.” The surgeons in this study reported that their average CK patient was 48 to 52 years of age, which can be among the most active and financially productive years of a person’s life.

Similar to research conducted about patients’ motivation for undergoing LASIK, our study showed that the CK patient wants to reduce his dependency on reading glasses and improve his visual performance. In the context of presbyopia, performance means being able to read cell phones, price tags, menus, and newspapers without reading glasses. CK’s minimal invasiveness, affordability, and ability to restore vision to a quality previously enjoyed resonate
deeply with this mature, conservative age group that has had good vision for 50 years.

**CK's ROLE IN THE FUTURE**

Refractive surgery is a field rapidly advancing, with many developments geared toward alleviating presbyopia. Some promising innovations include accommodating, multifocal, and phakic IOLs; corneal inlays and onlays; and presbyopic (multifocal) LASIK. Even with these potentially more advanced developments on the horizon, 80% of surgeons interviewed (16 of 20) believed that CK would still be important during the next 3 to 5 years (Figure 4). This majority was impressed with CK's safety profile and what it offers to patients who are averse to risk. Half of this majority (eight individuals) believed CK would grow into a big player in the refractive field. They viewed its widespread market adoption as only a matter of time, considering the growing awareness and acceptance of the procedure among both surgeons and patients. The other half of this majority saw CK as remaining an important niche player, much as it is today, with its role limited to a step before the full refractive correction offered by LASIK for pre-presbyopes and by an IOL for presbyopes, with and without a cataractous lens.

The remaining 20% of surgeons interviewed (four of 20) felt that CK would become obsolete once presbyopic LASIK or a corneal inlay became available. They hoped that a different solution would provide better predictability with less risk than an intraocular implant. Admittedly, however, they lacked enough data to evaluate whether or not a multifocal ablation or an inlay would be efficacious in real-world clinical practice. Only time will tell. Furthermore, although these surgeons expected advances beyond CK, it was still an important tool in their refractive practice today.

In spite of differing opinions about the future, all 20 surgeons interviewed believed that CK was an essential surgical tool and would purchase the system again if given the choice today.

**SUMMARY**

This survey yielded several key findings that should prove helpful to surgeons who are considering adopting the technology as well as to current CK users who wish to increase their use of and success with it.

- Not unlike other eye care technologies such as phacoemulsification or corneal excimer laser ablation, CK has undergone refinements that have improved its outcomes.
- The ideal CK patient is different from other ophthalmic patients. The former requires time to become educated about and interested in CK. This was also true of laser vision correction in its early days.
- Surgeons need to approach CK differently than LASIK. Patients' expectations for CK and the management of those expectations are indeed different from those of LASIK patients.
- The low acquisition cost of the Viewpoint CK device makes it easily justifiable; its break-even procedural volumes are a fraction of what is required with LASIK. Further, CK has an additive effect on existing LASIK procedural volume and can be used as a tool for future growth of the practice with advanced IOLs.
- Despite more advanced technology on the horizon, CK is destined to have a role within the ophthalmic practice due to its strong safety profile relative to existing and emerging technologies designed for the presbyopic population.
- Therapeutic uses for CK are just beginning to emerge, with several key, large studies currently underway. Leading corneal specialists view CK as a tool that allows them to rescue less-than-desirable outcomes from other refractive procedures or ocular trauma.

Shareef Mahdavi draws on 20 years of medical device marketing experience to help companies and providers become more effective and creative in their marketing and sales efforts. Mr. Mahdavi welcomes comments at (925) 425-9963 or shareef@sm2consulting.com. Archives of his monthly column may be found at www.crstoday.com.