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WHAT'S THE BIG IDEA?

Ophthalmology attracts innovators
like nectar attracts bees.

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Premium Practice Today is a monthly feature section in **CRST** providing articles and resources to assist surgeons and their staff in the pursuit of premium practice development to facilitate exceptional experiences for patients and business success.

What's the Big Idea?

Ophthalmology attracts innovators like nectar attracts bees.

BY ROCHELLE NATALONI, CONTRIBUTING EDITOR

Innovation is the bedrock of progress in ophthalmology. During the past few years, I have become concerned by the “clamp down” on discussions between companies and physicians (due to increasingly strict rules on compliance) and among physicians themselves (due to restrictions on the off-label use of products). The unintended consequence is that innovation will suffer. That is why this month's column—a discussion of both surgical and business innovation—is important as we continue to make progress in the field. It is also why I am involved with Strathspey Crown and Alphaeon, a new company that holds as its key tenet the maintenance of freedom so that surgeons can innovate and companies can operate with the goal of improving patients' outcomes as well as their experiences. Read on!

—Section Editor Shareef Mahdavi

Big ideas and the innovators who conceived them built the subspecialty that is widely known today as *refractive cataract surgery*. Giants of surgery—like Charles Kelman, who essentially reinvented cataract surgery with the development of phacoemulsification, José Barraquer, who was responsible for the microkeratome and keratomileusis, and Svyatoslav Fyodorov who developed RK and, perhaps more importantly, the first phakic IOL—provided the building blocks. Smaller but nonetheless substantial ideas by innovative thinkers provide the mortar that helps this specialty continually reach new heights.

It is obvious that need, support, and funding help keep good ideas alive, but why do some ideas mushroom into paradigm-changing practices, while others shrivel on the vine? What environment best nourishes the seeds of innovation? Author and innovator Steven Johnson (● www.stevenberlinjohnson.com/2010/06/where-good-ideas-come-from.html) has built a career by exploring these questions. People often credit their ideas to individual “Eureka!” moments, but Mr. Johnson, the founder of Patch (● www.patch.com), a website that maps online conversations to real-world neighborhoods, suggests that history tells a different story. In his seminal book *Where Good Ideas Come From, The Natural History of Innovation*, he reports that good ideas tend to flourish in an environment of connectivity.

Mr. Johnson writes, “We are often better served by

connecting ideas than by protecting them. Like the free market itself, the case for restricting the flow of innovation has long been buttressed by appeals to the ‘natural’ order of things. But the truth is, when one looks at innovation in nature and in culture, environments that build walls around good ideas tend to be less innovative in the long run than more open-ended environments. Good ideas may not want to be free, but they do want to connect, fuse, recombine. They want to reinvent themselves by crossing conceptual boundaries. They want to complete each other as much as they want to compete.” For more information, watch these videos: ● <http://tinyurl.com/25edr9o> and ● <http://tinyurl.com/2ftfah6>.

OBSESSIVE CONCENTRATED THOUGHT

Australian ophthalmic surgeon Noel Alpins (● www.newvisionclinics.com.au/dr-alpins/dr-alpins-experience.htm) is a modern-day example of an ophthalmic innovator whose idea flourished because it filled an important need. His Alpins Method of Astigmatism Analysis has become the accepted standard worldwide for reporting the results of studies that measure both corneal and refractive results of refractive and cataract/IOL surgery (Figure 1). Dr. Alpins says, “Previous work on vectors in astigmatism had been done, but it was very limited. I knew of this work and, at the same time, knew that the



Figure 1. Noel Alpines' Method of Astigmatism Analysis has become the accepted standard worldwide for reporting the results of studies that measure both the corneal and refractive results of refractive and cataract/IOL surgery.

then-current approach to astigmatism was limited and even contradictory. Lasers used one approach; the use of incisions used another approach. The disparity was a constant sense of uneasiness for me and became compelling with the advent in mid-1992 of excimer laser surgery combining astigmatism in the treatment."

Mr. Johnson's observations regarding the connectivity of ideas are apparent in Dr. Alpines' astigmatism analysis work. "There have been several people along the way who have tweaked my interest and understanding with various comments—both critical and positive," he says. "Every week for 5 years on a Friday morning at 4 weeks postsurgery, I selectively cut sutures only two to three at a time. The process could have been called 'dynamic vector analysis,' since the goal of each removal session was to rotate the corneal steep meridian to 90° as well as [to reduce] its magnitude." He presented his findings in 1986, but realized the scientific and mathematical evaluation of the process had a long way to go. It was another 6 years before all of the pieces of the puzzle began to fall into place. Dr. Alpines has obtained a number of patents on the method; these patents are programmed into a commercially available ophthalmic surgical analysis system called ASSORT (Alpines Statistical System for Ophthalmic Refractive Surgery Techniques), designed to help plan and analyze the results of refractive, corneal, and cataract surgical

"We constructed a vector diagram that satisfied his computing requirements and my outcome analysis needs by adding this crucial but real parameter: target astigmatism."

—Noel Alpines, MD

procedures (📍 www.assort.com).

"The ball got rolling with the epiphany that occurred on April 28, 1992," Dr. Alpines says. "I remember the date so distinctly because it was the eve of my daughter's 21st birthday. I knew I was onto something but was unaware of how enormous it would grow. We did have a very good birthday party that night, though." On that day, he was working with his ASSORT programmer computing an analysis by topographical values using refractive treatment parameters. "The refractive astigmatism values used in the laser were from the manifest refraction, which still exists now in conventional wisdom and hence is the dominant treatment parameter paradigm," he says. "The corneal astigmatism uncommonly coincided. We constructed a vector diagram that satisfied his computing requirements and my outcome analysis needs by adding this crucial but real parameter: target astigmatism. In all of our searches of the literature and documents, this 'non-zero goal' had never been published. The clinical application of each of these individual 'lines on a page' and others that derived from them took me 3 years of obsessive concentrated thought to discover the answers of this prevailing unsolved conundrum."

The more Dr. Alpines delved into vector analysis, the more applications he perceived for it. "I saw that it was applicable to the various hemidivisions of the cornea (in the case of irregular, nonorthogonal astigmatism)," he says. "I saw that it could be used not only in analyzing results but actually in planning an approach and refining the effects of lasers and incisions based on an individual surgeon's results. It could also be used to analyze the results of groups of patients in a coherent manner, which was not possible before the Alpines Method. These insights provided fodder for many more articles over the years, both

from my group and from other groups around the world. The basics of my method finally were incorporated into astigmatism analytic approaches advocated by the American National Standards Institute. My approach became an accepted, preferred, worldwide standard. Its use by other research groups around the world supports the contention that it is an accepted standard worldwide for reporting the results of studies that measure both corneal and refractive results of refractive and cataract/IOL surgery. It was an uphill battle from the start, and it continues to meet resistance. Fortunately, there is simply no better way to plan and analyze surgical approaches meant to improve vision in people with astigmatism. Mathematically, it is the only and best way to proceed, and the fundamental mathematics convince me that no better way might ever be developed. If I am found wrong about this, I'll be the first to acknowledge it. I have always felt that truth, facts, and science will trump anyone's financial or political interests."

HAVE IT YOUR WAY

Arun C. Gulani, MD, in practice in Jacksonville, Florida (📍 www.gulanivision.com), is another inno-

vator whose ideas have influenced the progression of the specialty, as well as the growth of his burgeoning practice. His most recent brainchild is "Vision à la Carte." This model enables surgeons to design vision according to each patient's individual needs, using all of today's techniques and technologies. It breaks the process down in ways that are easy for patients to understand and that rely on an algorithm enabling them to choose the technique, technology, and targeted outcome (Gulani 3T System) that they want. Dr. Gulani explains that about 48 offerings fall under the "umbrella" of vision correction surgery, including nine different types of LASIK, seven types of corneal transplants, six types of premium IOLs with cataract surgery, three ways of doing corneal cross-linking, etc. "This concept of planning with patients excites them about the fact that we are personalizing a plan in their best interest, and because of this, the cost issue becomes secondary instead of influencing the patient's choices and sometimes leading to trade-offs that are not in the patient's best interest," he says.

There are no discounts, deals, or hype in his practice, which has an unusually large referral rate from refractive surgeons worldwide.

EYE-OPENING IDEAS

In the 1950s, the microkeratome and keratomileusis technique were developed in Bogotá, Colombia, by the Spanish ophthalmologist José Barraquer.

In the late 1960s, ophthalmologists Alan Scott and Edward Schantz were the first to work on a standardized botulinum toxin preparation for therapeutic purposes. By 1973, Dr. Scott used botulinum toxin type A (BTX-A) in monkey experiments, and in 1980, he officially used BTX-A for the first time in humans to treat strabismus and blepharospasm.

In 1980, Rangaswamy Srinivasan, PhD, discovered that an ultraviolet excimer laser could etch living tissue, with precision and with no thermal damage to the surrounding area. He named the phenomenon *ablative photo-decomposition* or *APD*.

The cosmetic effect of BTX-A on wrinkles was originally documented by a plastic surgeon from Sacramento, California, Richard Clark, and published in the *Journal of Plastic and Reconstructive Surgery* in 1989. Canadian husband and wife ophthalmologist and dermatologist physicians, Alastair and Jean Carruthers, were the first to publish

a study on BTX-A for the treatment of glabellar frown lines **in 1992**.

In 1985, Steven Trokel, MD, published his work using the excimer laser in RK. He wrote, "The central corneal flattening obtained by radial diamond knife incisions has been duplicated by radial laser incisions in 18 enucleated human eyes. The incisions, made by 193-nm far-ultraviolet light radiation emitted by the excimer laser, produced corneal flattening ranging from 0.12 D to 5.35 D. Both the depth of the corneal incisions and the degree of central corneal flattening correlated with the laser energy applied."

In 1989, Gholam A. Peyman, MD, was granted a US patent for LASIK. It was, "A method and apparatus for modifying the curvature of a live cornea via use of an excimer laser."

In 2013, ophthalmologists Leonard Flom and Aran Safir, MD, were inducted into the United States Patent and Trademark Office's National Inventors Hall of Fame for the invention of the iris recognition scanner. The patent was awarded **in 1987**.

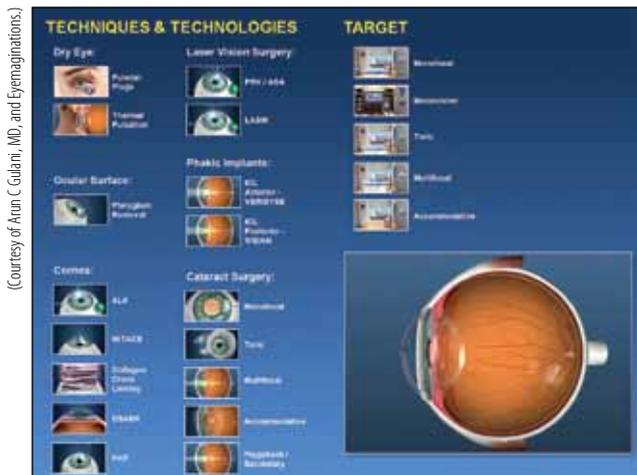


Figure 2. Vision à la Carte.

The Gulani 5S Classification System algorithm provides the foundation for the customized approach and makes the treatment plan for any case—no matter the complexity—easy for patients to comprehend and surgeons to perform. The 5S Classification algorithm involves classification according to sight, scar, shape, strength, and site (Figure 2):

- **Sight.** What is the patient’s vision potential?
- **Scar.** Is the cornea scarred or clear?
- **Shape.** What shape does this laser vision surgery require? Flattening for myopia, steepening for hyperopia, or turning a football-shaped astigmatic cornea into a spherical basketball.
- **Strength.** Is the cornea tectonically strong? Is it too thick or thin?
- **Site.** Is the problem peripheral or central?

This concept not only allows surgeons to truly customize treatments and technologies to each patient individually, but it also presents combined techniques in cases when the patient is not a candidate. He says his practice is a world destination for complex cases, second opinions, and complications of premium cataract and LASIK surgery. Dr. Gulani says his system moves patients away from the same-burger-for-everyone surgery to a have-it-your-way menu of options.

BIG LITTLE IDEAS

New Jersey LASIK surgeon Cary M. Silverman’s most recent noteworthy idea is based on helping patients understand their options (www.eyecare2020.com/services/cataracts/)

“The Gulani 5S Classification System algorithm provides the foundation for the customized approach and makes the treatment plan for any case—no matter the complexity—easy for patients to comprehend and surgeons to perform.”

eyecare-2020-now-offers-laser-cataract-surgery-with-catalys). “I started doing femtosecond [laser] cataract surgery [in 2013],” he says. “In order to make it easier for my patients to understand its benefits, I coined the term ‘HD Cataract Surgery.’ It is very easy to explain to patients that the laser allows us to achieve superior, safer results with decreased risk. They really get this, as [evidenced] by the fact that more patients are opting for HD Cataract Surgery than not.”

These “smaller” ideas certainly do not have the penetration of Dr. Kelman’s or Prof. Barraquer’s innovations, but they are representative of the agile minds that appear with frequency in the specialty. For instance, Francis W. Price Jr, MD, a 2011 winner of the Barraquer Award for significant contributions in refractive surgery and the namesake of his Indianapolis-based Price Vision Group (PVG; www.pricevisiongroup.com/francis-price-md.html), developed an interactive informed consent computer program that explains refractive surgery to PVG’s patients. The presentation consists of narrated videos, slides, and animations. It finishes with an automated test. If the patient answers incorrectly, the program automatically replays that section and asks the question again. “The patient can’t ‘graduate’ until [he or she gets] all correct answers,” explains PVG’s Practice Administrator Tony Sterrett. “The results are automatically posted to our electronic health record, and it notes any questions with which the patient may have had a problem. It does a great job of informing the patient, protecting the surgeon, and it saves 40 minutes of chair time.”

Mr. Sterrett states that Dr. Price was looking for a way to better inform patients of the risks and benefits of refractive surgery, resulting in less legal

TABLE. LASIK TRAVEL PACKAGE RESULTS

Media buy total: \$3,456	
Letter and coupons to ODs: \$358	Leads: 147 people
Hotel accommodations: \$6,976	Cost per lead: \$155
Restaurant certificates: \$4,000	Surgeries: 80 people
Gas cards: \$8,000	Cost per case (eyes): \$142
Total costs: \$22,790	Approximate revenue: \$344,000

exposure for the surgeons. When he could not find a better one, he created what he had in mind. "A nice side effect is that we save expensive chair time with senior staff members," Mr. Sterrett says. "The patients are on autopilot at a computer station as opposed to asking questions to my surgical staff. After completing the program, the patients have a face-to-face meeting with their doctor, and they have the opportunity to ask questions. They usually have no questions because the program does a great job of clarifying everything."

Dr. Price was looking for a way to better inform patients of the risks and benefits of refractive surgery, resulting in less legal exposure for the surgeons. When he could not find a better one, he created what he had in mind.

Patty Casebolt, clinical director of Medical Eye Center in Medford, Oregon (www.medicaleyecenter.com), described a recent idea that helped her practice generate revenues of \$344,000 at a cost of just \$22,790 (Table). "Our LASIK volume had plummeted, and we found that our number of new leads had also been severely depleted," she explains. "We devised a new marketing approach to revive some of our outlying areas and came up with a LASIK travel package for patients who have to travel from outside of our area. They get \$500 off of LASIK, a \$50 gift certificate for dinner, a \$100 gas card, and a 1-night stay at a local hotel. Earlier, we had marketed this as the 'LASIK Recession Package,' and it was quite successful. Now

that people are tired of hearing about the recession, we have changed the wording to 'LASIK Travel Package.'"

STAFF SUGGESTIONS

David A. Goldman, MD, of Goldman Eye in Palm Beach Gardens, Florida (www.goldmaneye.com), shared an idea from one of his staff members. "In my office, there is an HDTV in the waiting room," he says. "To try to save on expenses and to improve the quality of the picture, we tried an HD antenna. It worked OK most of the time, but sometimes, it did not, and the patients would complain. We then signed up for cable and would hear patients arguing over what program should be on. My front desk staffer suggested that we get a Blu-ray disc, such as the *Planet Earth* series. After a minimal expenditure (\$150) at Best Buy, the problem was solved. Now, the picture is always excellent, we don't pay for cable, and patients love the cinematography. It's a win-win."

Clearly, every idea is not a game changer, but every one borne of a need for improvement keeps the game moving forward. ■

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