Monday, 14th September, 2026

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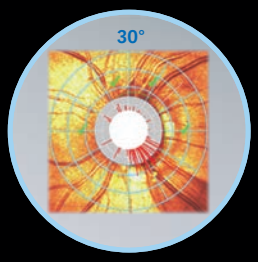

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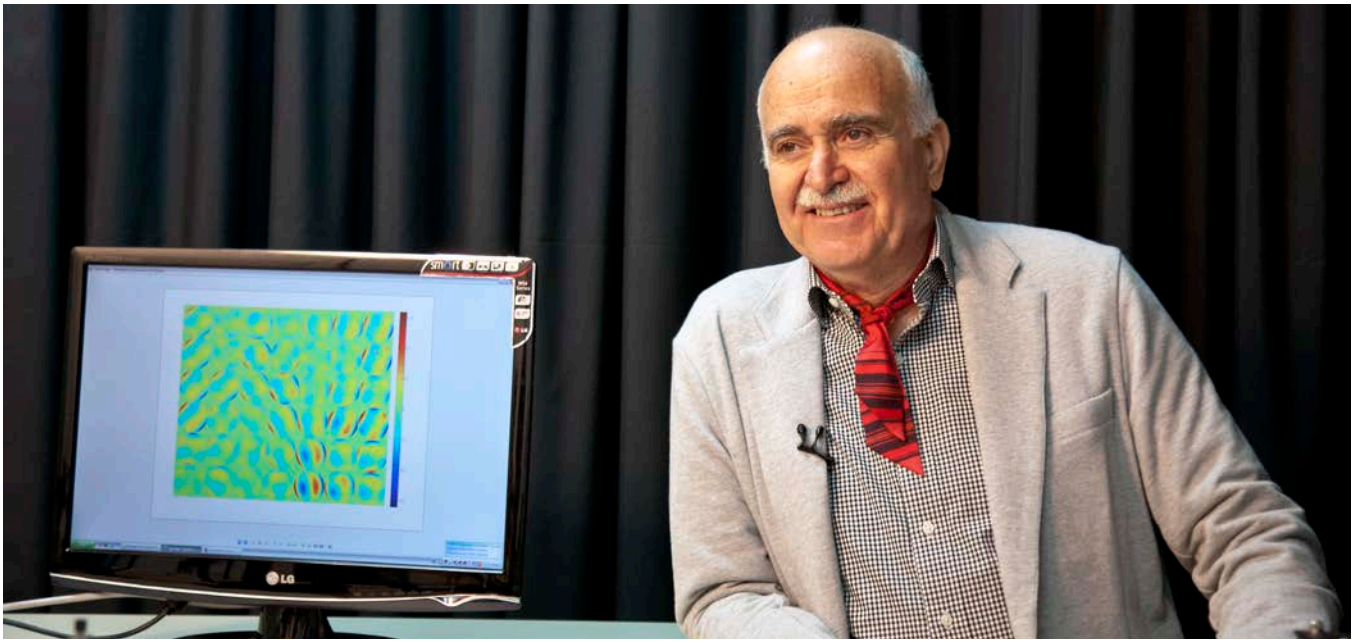

Ioannis Pallikaris and the Art of Refractive Surgery

Refractive surgery pioneer Ioannis Pallikaris, MD, PhD, delivered this year's ESCRS Heritage Lecture on a topic he is eminently qualified to discuss: 'LASIK, What Next?'

"It is a privilege to present the Heritage Award to Professor Pallikaris, a visionary whose work has influenced refractive surgery, visual optics, and ophthalmic innovation for more than seven decades," said Professor Burkhard Dick, president of ESCRS. "He played a pivotal role in the development of LASIK—in fact, coining the term. He later invented Epi-LASIK, and has continued to contribute to the field, especially in the evolution of corneal refractive surgery."

Prof Pallikaris's achievements extend beyond refractive surgery to include ray tracing aberrometry and visual optics, ophthalmic instrumentation, ocular biomechanics, presbyopia correction, and corneal inlays, added Prof Dick.

In his lecture, Prof Pallikaris shared that as a young man he wanted to be an artist. Later in life he became a farmer, growing his own wheat because he wanted to make his own bread.

In between these life moments, he dedicated his life to the art of vision correction surgery. His talk highlighted the influence of his many mentors, a 'who's who' of notable ophthalmology pioneers, including Svyatoslav Fyodorov, George Waring, Theo Seiler, John Marshal, Marguerite McDonald, and Prof. Ignacio Barraquer.

His relationship with the cornea began with his PhD research in Zurich, where he focused on predicting induced astigmatism after penetrating keratoplasty (PK) in keratoconus. Utilizing a primitive computer to analyze Placido disk photographs, he laid foundational work that would later contribute to corneal topography. He also proposed a double suction trephine to enhance safety during trephination, an early version of what would become the Baron trephine.

Between 1981 and 1987, he practiced exclusively in vitreoretinal surgery with Prof Kloeti Grieshaber in Switzerland. Upon being elected a Professor at the University of Crete in 1987, he decided to pivot to laser technology. During this time, he visited Prof Franz Fankhauser in Switzerland, developer of the YAG laser, who introduced him to the excimer laser—a groundbreaking new technology. Dr Fankhauser, in turn, encouraged him to meet with Theo Seiler in Berlin and John Marshall in London.

He studied photo refractive keratectomy and began to recognize epithelial healing problems, including pain, regression, and haze. He wanted to address these issues by preserving the epithelium and performing the ablation in the corneal stroma. This led to the concept of the hinged flap to preserve a stable connection with the stroma and in some degree the subepithelial nerve plexus. This would eventually become LASIK, first presented at an ESCRS Congress in Zurich in 1989.

Skipping ahead to the present, Prof Pallikaris has developed a novel endocapsular device to be used during cataract surgery. The fixOflex™ is an endocapsular device specifically designed to avoid posterior capsule opacification (PCO) formation. The device is implanted in the sulcus before phacoemulsification protects the IOL from fibrosis, potentially providing some accommodative power.

Ioannis Pallikaris, MD, PhD, is the founder and director of the Institute of Vision and Optics, University of Crete. He is a former president of ESCRS and has received many awards for his work, including the ESCRS Binkhorst Medal.

KAI Index Enhances Diagnostics

Novel AI index for MS-39 AS-OCT improves early keratoconus detection.

TIMOTHY NORRIS REPORTS

The Keratoconus Artificial Intelligence (KAI) Index, a novel AI-driven tomographic metric integrating epithelial thickness mapping for CSO MS-39 anterior segment optical coherence tomography (AS-OCT), demonstrates high levels of accuracy in detecting manifest keratoconus, with promising performances in the grey zone of borderline ectasia.

According to its developer, Riccardo Vinciguerra MD, the KAI Index is a welcome addition to the platform developed by CSO (Costruzione Strumenti Oftalmici). "Every anterior segment analyser needs an index for screening both refractive surgery and keratoconus. Other platforms already feature combined indices, but at the moment, MS-39 only has the Artificial Neural Network Classifier that tells [surgeons] if the patient has keratoconus, a suspect keratoconus, an anomaly, or none," he said.

Professor Vinciguerra said this classification system might give some surgeons pause during the preoperative phase. This uncertainty prompted him to develop a new artificial intelligence-based index for MS-39 to be assessed in a cross-sectional diagnostic accuracy study.

The study, presented in a free paper session, involved five international centres and considered 4,200 eyes from 3,785 patients. Of those surveyed, 1,992 were normal eyes, 1,793 had keratoconus, and 415 had very asymmetric ectasia and normal topography (VAE-NT). All eyes underwent imaging with the CSO MS-39 AS-OCT. Topographic and epithelial parameters were analysed. Feature selection was performed using receiver operating characteristic (ROC) analysis and LASSO linear regression technique.

Moreover, logistic regression, support vector machine, and random forest classifiers were trained on the subject-level stratified splits. In the internal test set, the KAI Index achieved an area under the curve (AUC) of 1.000 for normal versus keratoconus and 0.971 for normal versus VAE-NT. In the external validation, the AUC of the KAI Index was 1.000 compared to Oculus' BAD-Dv3 at 0.995, Pentacam's Random Forest Index at 0.987, Corvis' TBI v2 at 0.994, and CBI at 0.971. In VAE-NT eyes, the KAI Index achieved an AUC of 0.878 compared to TBI v2's 0.844, although the difference was not statistically significant. However, significant differences were found between the KAI Index AUC and CBI (0.771), PRFI (0.752), and BAD-Dv3 (0.708).

In terms of performance, the KAI Index performed better than the CBI and comparably to the TBI, Prof Vinciguerra pointed out. Besides, TBI requires two different devices to be able to perform, while KAI is specifically designed to be a one-device index, using only CSO's AS- OCT. The release of the KAI Index on the CSO MS-39 AS-OCT platform is imminent.

This is not in its development phase, it is launching now on the device software.

"This is not in its development phase, it is launching now on the device software," Prof Vinciguerra said. "It will be available for all users in a very short time. With the MS-39 already being a very comprehensive and reliable device, the integration of the KAI Index makes it the total package, as we worked together in a joint effort to make something really useful for everyone."

Riccardo Vinciguerra MD is Associate Professor of Ophthalmology at the Humanitas San Pio X, Milan, Italy.

DON'T MISS

Today's Congress Highlights

Arena Debate
AI or IOL adjustability will outplan the surgeon in IOL power calculation within five years.
14:15 - 15:15
M2 (Arena)

Arena Forum
Solutions for Complications in Cataract Surgery
15:45 - 16:25
M2 (Arena)

Artificial Intelligence
AI Digital Summit: Today's application of AI to improve decision making and practice efficiency
10:15 - 12:00
Victoria Room 3

BoSS Course
Creating respectful and inclusive ophthalmology work environments: understanding and addressing bullying and harassment
9:00 – 11:00
Capital Suite Rooms 2-4

Digital Health Symposium
AI in your practice now
14:30 - 16:30
George V Room 1

ESCRS Research Workshop
I have a great idea ... now what?
14:30 – 16:00
Capital Suite Rooms 2-4

IME Forum
The digital cataract surgery workflow: integrated diagnostics, surgical planning, AI and visualization
13:00 - 14:00
Victoria Room 3

Main Symposium
Strategies for best outcomes from cataract surgery in eyes with corneal pathology
11:00 - 13:00
ICC Auditorium

The Resilient Surgeon
The non-surgical part of being a surgeon: How do we make sure you can keep performing?
16:45 - 18:15

Selfless Patient Allowed PRK to Enter the Clinic

Looking back at the start of excimer laser refractive surgery with Marguerite McDonald MD.

CHERYL GUTTMAN KRADER REPORTS

In 1988, Marguerite B McDonald MD, a young faculty member at Louisiana State University (LSU) in New Orleans, US, performed the first in-human excimer laser refractive procedure. The patient, Alberta Cassady, had advanced ocular melanoma and was scheduled to undergo exenteration of the eye in 11 days.

"Alberta asked her oculoplastic surgeon if anyone could use her eye for research. If it were not for this selfless thought, we may never have moved beyond doing only preclinical research," Dr McDonald emphasised.

While the FDA had refused to allow initiation of a blind eye clinical trial, the agency granted permission to perform photorefractive keratectomy (PRK) on Ms Cassady, whose eye was healthy aside from the tumour and emmetropic with 20/20 vision.

"We performed a 4.5 D myopic ablation. Findings from daily exams until the exenteration and on post-exenteration examination showed the refractive and anatomic results were perfect," Dr McDonald said.

"We named our research lab after Ms Cassady, but I think it would also be fitting for laser vision correction procedures to be called Cassady procedures instead. Without Ms Cassady, we might still be doing monkey studies."

Dr McDonald's interest in using the excimer laser to reshape the cornea arose in 1983 after reading the *American Journal of Ophthalmology* paper "Excimer laser surgery of the cornea" by Stephen Trokel MD, and colleagues. Dr McDonald had recently joined the LSU ophthalmology department after completing a coveted cornea fellowship under the mentorship of Herbert E Kaufman MD and was the leader of the department's refractive team.

"What I found most intriguing in this paper describing removal of corneal tissue without collateral thermal damage was a finding suggesting the laser might be used for refractive surgery," she explained.

After contacting Dr Trokel about exploring this idea and enticing him with the idea that the LSU primate centre offered access to animal eyes, Dr McDonald teamed up with Dr Trokel, who was already working with Charles Munnerlyn PhD. Stephen Klyce PhD also joined the team, using his new colour-coded corneal topography maps to help guide the effort. Live animal research began after countless plastic blocks and animal cadaver eyes were ablated using a wide beam industrial laser, but the initial in vivo outcomes were poor as the eyes developed significant central corneal scars. Not giving up, Dr McDonald postulated that changing the laser diaphragm stops from 5 to 40 could solve the problem. She was right.

Without Ms Cassady, we might still be doing monkey studies.

Once they treated Ms Cassady, the team was granted FDA permission to begin treating blind eyes. Fear the laser could leak toxic gas into the environment required that the procedures be performed in an outdoor trailer situated next to a trash compactor away from campus buildings. Concerned that shaking of the laser induced by the operating compactor was compromising surgical outcomes and unable to get the sanitation engineers to stop the compactor during surgeries, Dr McDonald set out to prove her point.

"Much to my amazement and embarrassment, I found procedures performed when the compactor was running had better outcomes," she said. "Realising that the vibrating laser created blended zones between spots and therefore smoother ablations, we increased the number of diaphragm stops to 120 and achieved better results."

Dr McDonald recognises she is a key figure in the development of excimer laser refractive surgery. But, she also emphasises she had the good fortune to work with a tremendous team and is honoured knowing that their seminal work has improved quality of life for so many people.

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Reference: 1. Nanavaty MA, Findl O, Carones F, et al. Proportion of patients with *Demodex* blepharitis in ophthalmology clinics in Europe: the Eos study. Eye. 2026:40:165-167.

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Intraocular Lenses in Outer Space

Lenses fare well after six months in space.

What would be the best way to ship intraocular lenses (IOLs) and the other equipment needed for surgery into space for the potential needs of astronauts on a mission to Mars?

A new study by Morgan Micheletti MD and colleagues presented at the ESCRS Annual Congress in London considered how IOLs could best be packed, transported, stored, and protected from the space environment.

"I believe someone will need cataract surgery on Mars in my lifetime," Dr Micheletti said. "A Mars transit can require almost a year—and returning to Earth for a vision-limiting cataract, injury, or other surgical eye problem may not be realistic. Eventually, treatment will need to happen where the patient is."

Investigators on the JAMES project (Joint Assessment of Material Exposure in Space) flew 135 unpackaged IOLs to the International Space Station (ISS). The lenses were housed in special carriers called CLAIRE (Carrier for Lens Analysis in Interstellar Research Expeditions), which were mounted on three different locations on the exterior of the ISS. These positions included Ram, where the lenses were exposed to high atomic oxygen; Zenith, where the lenses were exposed to substantial ultraviolet (UV) from the Sun; and Underdeck, where the lenses were partially shielded from direct atomic oxygen and solar UV through their position under the exposure platform.

After approximately six months in orbit, the 135 flight lenses returned to Earth. The current analysis included 61 of those lenses and 20 of the 45 controls stored on Earth. Liliana Werner MD, PhD and her team at the Intermountain Ocular Research Center at the University of Utah, US, examined the lenses for overall clarity, how well the materials remained intact, and whether there were any deposits or changes on the surfaces.

Most of the lenses exposed to space conditions (42 of 61) showed no notable exposure-associated findings. The other 19 lenses demonstrated three principal patterns:

1. In the most directly exposed Ram tray, eight of the nine lenses showed cracks and localised surface roughening consistent with early atomic oxygen erosion. All eight were acrylic, including five hydrophobic and three hydrophilic lenses. The ninth lens was silicone and showed yellow discoloration.
2. Five space-exposed IOLs showed yellow discoloration, including two hydrophobic acrylic and three silicone lenses. Four were in the Zenith tray and one was in the Ram tray. Spectrophotometry showed lower light transmission, particularly between 400 and 500 nanometres.
3. All six space-exposed light-adjustable lenses, located in the three different positions on the ISS, showed a similar cobblestone or bubble-wrap appearance on both surfaces and along the optic edge. Neither of the two corresponding terrestrial controls showed that appearance. The mechanism remains unknown, and an explanation unrelated to direct space exposure cannot yet be excluded.

"This work matters now because these systems must be designed and validated long before the first patient needs them," Dr Micheletti explained. "We cannot wait until someone is on Mars to ask whether the lens, equipment, and sterile supplies survived the trip.

I believe someone will need cataract surgery on Mars in my lifetime.

"This was not intended to recreate how a packaged IOL would normally be shipped to Mars. The purpose was to identify potential failure modes under harsh exposure so we can begin designing better packaging, shielding, storage, and material selection strategies. Testing the lenses inside the ISS would not answer the same question because the interior is controlled and pressurised. We want to minimise packaging and, ideally, determine whether these products can be shipped without climate-controlled crew-cabin storage, because mass and volume carry significant costs."

Morgan Micheletti MD, FACS practices at the Berkeley Eye Center, Houston, Texas, US.

Lessons Beyond the Balance Sheet

How a story of hardship turned into a success—and how it can help other ophthalmologists.

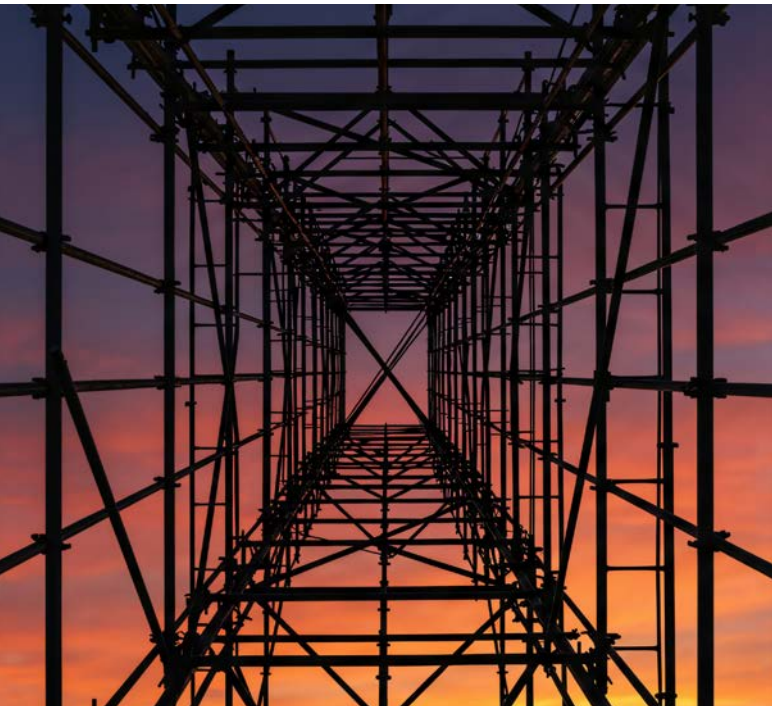
LAURA GASPARI REPORTS

Opening a private ophthalmology practice often means having to navigate the worlds of business, finance, and management. Without a solid foundation, it can quickly turn into a nightmare the moment an unexpected setback throws a spanner in the works. Christina Grupcheva MD, PhD described her own cautionary story during a Leadership, Business, and Innovation (LBI) session on wealth management.

Life can sometimes be unapologetic and unpredictable. Professor Grupcheva knows this well. After returning to her native Bulgaria 20 years ago after a period of research and clinical work in New Zealand, she refused to settle for a position at a public hospital with a below-average salary. Instead, she pursued her dream of opening a small private practice, modelled on what she saw in New Zealand, with a more personalised approach to patient care and quality examination—something that was largely unheard of in Bulgaria at the time.

Without a business and management background, she managed to secure a loan for a construction site to start building her project before life interfered. Suddenly widowed with an underage child, she persevered, working around the clock beyond her ophthalmic practice to manage her resources, repay her loan, and cope with health issues that gave her a new perspective.

"It was the time to be educated, so I assigned myself to a university business programme, and I finished a master's in public management," Prof Grupcheva recounted.



AI can search for personalised solutions for you, but it cannot give you inspiration; it comes from meetings like these and LBI educational programmes.

Many years later, she her practice was thriving, and she even expanded it. Her son, now a vitreoretinal surgeon with his own practice, completed a business and management education programme and has helped Prof Grupcheva with her practice.

The importance for ophthalmologists to have business administration education is crucial, she stressed. Especially important is maintaining financial stability by keeping liquid assets available to cover unexpected expenses and taking a holistic approach to future planning that extends beyond the balance sheet—a lesson she said she learned the hard way. A clinical practice is not a single business, even if the goal is to provide the best patient care possible. Real estate management, medical business, equipment management, and human resources have distinct challenges practices must take into account.

These factors are what makes the ESCRS LBI Committee a crucial resource for ophthalmologists, she said. The committee provides ophthalmologists with the resources and opportunities to learn and develop professionally. Prof Grupcheva sees an unmet need for guidance that can help ophthalmologists make a sound plan, learn from experts in the economic and financial sector, and gain an advantage to successfully carry out their projects. She also believes hearing stories such as her own can help others avoid making the same mistakes.

"Inspiration is extremely important today," she said. "AI can search for personalised solutions for you, but it cannot give you inspiration; it comes from meetings like these and LBI educational programmes."

Prof Grupcheva encouraged her motivated peers to check out Vision to Venture (V2V), the new flagship business education executive programme launched by the ESCRS LBI Committee. It acts as a specialised business accelerator designed to help ophthalmologists bridge the gap between clinical excellence and commercial success. She hopes to see more ophthalmologists interested in exciting LBI activities.

Christina N Grupcheva MD, PhD, DSc, FEBO, FICO (Hon), FBCLA, FIACLE is a Full Professor in Ophthalmology, a Member of the Bulgarian Academy of Science and several academic institutions, and a practicing clinician. She is part of the Leadership, Business, and Innovation (LBI) Committee.

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A Helping Hand in Neuroadaptation

AI-assisted conversations may support patients in considering IOL implantation with less anxiety.

TIMOTHY NORRIS REPORTS

Artificial intelligence may represent an essential tool for enhancing neuroadaptation in patients undergoing cataract and refractive surgery. Although it is a practical aid that can be implemented in the day-to-day clinical practice, it will never replace the ophthalmologist's role in the patient journey.

Speaking at a symposium on "Patient-Centred Functional Classification: PROMs and Clinical Relevance," Biljana Kostovska MD, PhD, said that there are many neurological processes for patients trying to adjust to a new visual output. These processes are sensory adaptation, cortical plasticity, binocular integration, attention, and perceptual learning.

"Over time, the brain gets better at focusing on useful visual information and reducing the impact of unwanted visual effects," she said. Halo, glares, and other photic phenomena are common in patients implanted with an intraocular lens, especially the premium variety. Patients will notice that something went wrong, that their vision is not what they expected from their surgery, she noted.

Professor Kostovska said patients implanted with multifocal lenses are particularly susceptible to photic phenomena and often have a harder time with neuroadaptation because they are adapting to a completely new way of seeing across multiple distances during daily activities such as screen use, watching television, or driving a car. A positive neuroadaptation process can be of utmost importance for these patients, especially in the presbyopia group, she said.

In such a delicate and difficult postoperative phase, patients may be tempted to seek frequent consultation with the eye doctor for reassurance. However, this is not always possible, and a lack of response can be perceived as disinterest, indifference, or unresponsiveness, which negatively impacts patient satisfaction and the refractive outcomes.

According to Professor Kostovska, a solution for these patient needs can be found by implementing an AI-assisted conversation support system. AI can support these patients through neuroadaptation by explaining what they are experiencing, providing answers to any of their questions, and reassuring them when they express concerns about their surgical outcome. Moreover, it can help identify when symptoms such as photic phenomena are part of the normal neuroadaptation process, explain the cause to the patient, and therefore reduce their anxiety. Prof Kostovska emphasised that AI should also be trained to accurately determine when to suggest whether a patient should consult the professional. Meanwhile, she said AI can provide the ophthalmologist some useful information about the patient between follow-up visits.

I see it as a kind of digital companion during the neuroadaptation period, while ophthalmologists should of course remain responsible for their clinical decisions.

Although she believes AI can be useful for this neuroadaptation process, Prof Kostovska stressed the technology remains as a tool rather than a replacement.

"AI cannot replace the ophthalmologist," she said. "I see it as a kind of digital companion during the neuroadaptation period, while ophthalmologists should of course remain responsible for their clinical decisions. The main goal is not to replace the doctor, but to give patients more support between follow-up visits."

Biljana Kostovska MD, PhD is an Ophthalmic surgeon at Sistina Ophthalmology Hospital in Skopje, North Macedonia.

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Henahan Writing Prize Essay: 'The Human Touch'

SUNAYANA NARASIMHA MURTHY MBBS, MS

Each year, young ophthalmologists are invited to participate in the John Henahan Writing Prize competiton by responding to an essay prompt. This year prompt read as follows: *The digital OR, AI algorithms, and robotics notwithstanding, cataract and refractive surgery involve a human relationship between you and your patient. Please describe how an experience or experiences in your early training reminded you of the importance of the human touch and how this has inspired you in your clinical practice.*

The UV lamp was humming, the riboflavin drops had been applied, and my young patient was lying still beneath the cross-linking apparatus. The procedure was underway, and I asked what he was doing now.

He was in his early twenties, referred to our centre with a diagnosis of keratoconus. The condition had cost him something most young men never have to consider losing: the visual acuity required to qualify as a pilot. It had been his dream to fly, to soar high up, but keratoconus had quietly, irrevocably closed that door.

As I monitored the procedure, he shared this with me not in anguish, but with a kind of quiet resignation. There was grief in his words, certainly, but also something else—a steadiness I had not expected. I found myself setting aside the clinical detachment that training instils in us, and I asked him simply: So, now what?

His answer stopped me.

He told me he had found his way to a prominent science institute in the country, where he was pursuing astrophysics. And as he said it, something shifted in his voice, the resignation lifted. He was not merely coping with an alternative; he was genuinely absorbed in it. The universe, it turned out, had offered him a different kind of sky to explore, and he had chosen to look up again.

I have thought about that moment many times since. Not because of what I did, but because of what he did, and what it revealed to me about the nature of our work as surgeons.

We are trained meticulously to master the technique. We study corneal biomechanics, perfect our centration, optimise our protocols. In an era of digital operating theatres and AI-driven diagnostics, the tools available to us are extraordinary. Yet, as I stood in that room monitoring wavelengths and energy levels, the most important thing happening was a conversation. A young man was being heard. In being heard, he articulated, perhaps for the first time, that he had not merely survived the loss of his dream, but had grown beyond it.

No algorithm prompted me to ask that question. No AI model flagged that this patient needed more than a technically sound procedure. It was the instinct that comes from being human with another human being, from recognising that the person beneath the UV lamp was not a cornea to be treated, but a young man carrying a story that deserved acknowledgement.

Medical science is, by its nature, imperfect. Outcomes depend not only on surgical skill but on immune status, genetic constitution, and the extraordinary complexity of the human body. We cannot control all of it. What we can control, what no machine can replicate, is the quality of presence we bring to each encounter. The trust a patient places in a surgeon is not merely clinical; it is profoundly human. And that trust, carefully tended, itself becomes a kind of medicine.

The older tradition of family physicians in India understood this intuitively. The therapeutic value of being truly seen by one's doctor is not sentiment, but science. Since Ader and Cohen's landmark demonstration in 1975 that psychological states can directly modulate immune function, the field of psychoneuroimmunology has established that the quality of human relationships in clinical care can influence immune response, pain perception, and recovery. This is the placebo effect in its truest form! Not deception, but the measurable healing power of human trust.

I carry that young man's story with me. When I sit with a patient who has received difficult news. An outcome that fell short of expectations, a diagnosis that changes their plans. I think of how a single question, asked with genuine curiosity, allowed him to discover something about himself. And I bring that into the room with the next patient, and the one after that. His story, shared in a quiet moment during a routine procedure, has shaped the surgeon I am becoming.

This is what artificial intelligence cannot do. It cannot carry one patient's courage into another patient's consultation. It cannot be moved by a story, or let that movement change the texture of its next encounter. The ripple of human connection, one patient's resilience becoming another patient's comfort, is uniquely ours to create and to pass on.

The digital operating theatre will continue to evolve. AI will sharpen our diagnostics, robotics will refine our precision. I welcome these tools. But I hope we never mistake efficiency for the whole of medicine. The young man who wanted to fly, and found instead the wonder of physics, did not need a more accurate algorithm. He needed someone to ask how he was and to listen, truly listen, to his answer.

That is the human touch. And it remains, above all else, irreplaceable.

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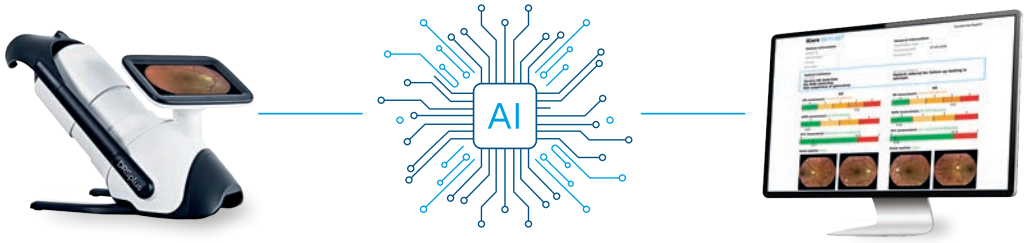

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Dust Mites are in the Eyes of the Beholder

Regular use of eyelash extensions linked to skin mites.

Dust mites, or *Demodex folliculorum,* are not uncommon in young women who regularly use eyelash extensions, according to a study presented at the 2026 ESCRS Annual Congress. Many of the women exhibit eye irritation and meibomian gland issues.

"Eyelash extensions are an extremely popular cosmetic procedure among young women because they provide the appearance of longer and fuller eyelashes without the need for mascara," said Tetiana Zhmud MD. "At the same time, there is growing evidence suggesting that this procedure may create problems on the surface of the eye, including irritation, dry eye symptoms, and meibomian gland dysfunction. However, the relationship between eyelash extensions and demodicosis remains poorly understood."

Dr Zhmud and her colleagues carried out a survey of 345 women aged between 16 and 28. They found that almost a quarter had received eyelash extensions. More than half (58%) had eyelash extensions every three to four weeks. Almost half of those who had eyelash extensions (47.6%) reported discomfort, redness, tearing, or itching after the procedure.

Meibography studies confirmed that 85% of those who had received eyelash extensions at least ten times exhibited signs of meibomian gland dysfunction. Microscopic examination of eyelash samples from 25 of the women found Demodex folliculorum in all but one. In 18 of the women, there were signs of irritation typically associated with skin mites, including itching and irritation around the eyelids, redness, swelling, eyelashes sticking together, and scaly skin at the base of the lashes.

"Our findings do not suggest that people should completely avoid eyelash extensions. However, they highlight the importance of proper eyelid hygiene, awareness of symptoms, and timely assessment when symptoms arise," Dr Zhmud said. "For optimal care of eyelash extensions, the use of a preservative-free, hypoallergenic gel designed for therapeutic eyelid hygiene may be recommended twice daily using an eyelash cleansing brush. In individuals with

The researchers caution this is a small study that did not include a comparison group of young women who had not received eyelash extensions.

confirmed Demodex infestation, a course of antiparasitic treatment may be considered.

"For clinicians, these findings emphasise the importance of considering demodectic blepharitis in patients presenting with chronic eyelid irritation, particularly those who regularly use eyelash extensions. For beauty professionals, our results may support the development of recommendations regarding eyelid hygiene and the need to inform clients about potential ocular health risks associated with repeated eyelash extension procedures."

The researchers caution this is a small study that did not include a comparison group of young women who had not received eyelash extensions. They say further research should include a larger cohort with and without eyelash extensions.

ESCRS Cornea Committee Chair Sorcha Ní Dhubhghaill MD, PhD, who was not involved in the research, said: "Although these mites are common, we don't typically see a lot of them in younger women. Usually, if they are present on the eyelashes, we spot them by the 'collarettes' they leave around the eyelashes. These are waxy rings made up of dead mites, mite faeces, and mite eggs, mixed with skin and oil. Since the adhesive used during eyelash extension procedures is applied near the base of the natural lashes, where collarettes are typically located, it could be much harder to spot them in women using eyelash extensions.

"It is important to emphasise that the presence of Demodex folliculorum does not necessarily indicate disease, as these mites may be part of the normal ocular microbiota. But it is important to detect them if they are causing symptoms, signs of inflammation, and meibomian gland dysfunction."

Tetiana Zhmud MD serves in the Department of Ophthalmology, National Pirogov Memorial Medical University, Vinnytsia, Ukraine.

Sorcha Ní Dhubhghaill MD, PhD is Chair of the ESCRS Cornea Committee and Head of Department and Corneal and Cataract Specialist at UZ Brussel, Belgium.

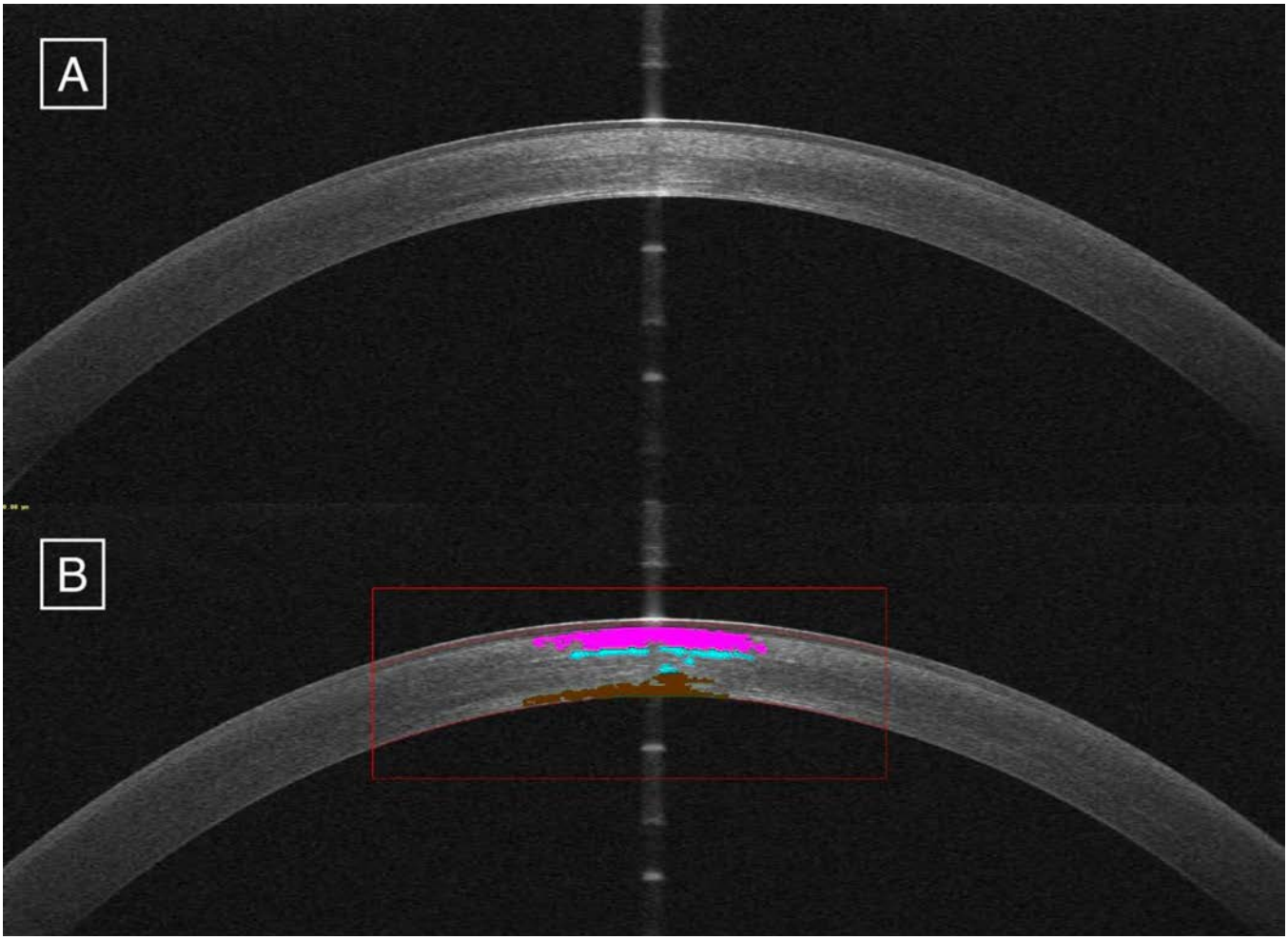

Figure 1. A) OCT scan of a cornea showing haze. B) Colour-coded automated segmentation of the corneal haze based on location (subepithelial and anterior, mid, and posterior stromal). The algorithm returns haze reflectivity, surface area, and overall anterior, mid, and posterior corneal reflectivity.

Evidence Supports Individualised Timing for Trans-PRK and CXL

Study documents similar outcomes for simultaneous versus sequential accelerated corneal cross-linking and transepithelial PRK.

CHERYL GUTTMAN KRADER REPORTS

Stromal haze profiles and visual, tomographic, and aberrometric outcomes at 12 months after customised transepithelial photorefractive keratectomy (trans-PRK) and accelerated corneal cross-linking (A-CXL) are similar whether the two procedures are performed in a single session or using a staged strategy, reported Shady Awwad MD in a free paper presentation at ESCRS 2026.

"We performed this study to address a very controversial question, one that, despite nearly 17 years of discussion, has never really been conclusively answered: When combining customised PRK with CXL to treat keratoconus, is it better to perform the two procedures simultaneously, or sequentially, with CXL first and PRK later? Previous studies provided conflicting results, particularly regarding corneal haze, safety, efficacy, refractive outcomes, and long-term stability," said Dr Awwad.

"To identify any true impact of the surgical sequence, we compared propensity score-matched groups and used a validated, OCT-based, machine-learning method to objectively quantify haze rather than relying on a subjective grading system, such as the Fantes scale (Figure 1). Having found that the simultaneous and sequential strategies had comparable safety, effectiveness, and haze profiles, our study provides support for surgeons making individualised decisions according to the characteristics of the eye and their clinical judgement."

Eyes included in the study were identified from a consecutive series of 118 eyes that had been prospectively followed at 1, 3, 6, and 12 months after simultaneous trans-PRK/A-CXL (n = 90) or following trans-PRK performed after A-CXL (median 36 months, n = 28). Dr Awwad was the one surgeon and used the same laser platform for all trans-PRK procedures. Mitomycin C was used only in cases of sequential trans-PRK.

Propensity score matching was conducted using age, sex, corneal thickness, Kmax, Kmean, and total coma and yielded two cohorts of 27 eyes each for the outcomes analyses. Baseline characteristics were similar in the two groups. At 12 months, both groups achieved a mean corrected distance visual acuity gain of two lines along with statistically significant improvements in Kmax and total corneal coma, and there were no statistically significant differences between groups in any of the three outcomes.

The OCT haze assessments showed reflectivity increased initially and then decreased with layer- and time-dependent kinetics. Some differences between groups were noted through follow-up to 6 months, but reflectivity profiles converged at 12 months, indicating no clinically meaningful difference in late haze burden, Dr Awwad said.

Offering his personal preference, Dr Awwad said he would probably favour performing the customised trans-PRK and A-CXL simultaneously in eyes with a moderate degree of optical aberrations. In more mildly aberrated eyes, however, the sequential approach may be preferable, performing cross-linking first and reserving customised trans-PRK for later if it is still needed.

Dr Awwad also emphasised that the customised treatment strategy he uses primarily targets higher-order aberrations rather than lower-order refractive error.

"We do not intentionally treat the lower-order aberrations except for the component that is intrinsically embedded within the higher-order aberration correction. We published our approach to this concept in the August 2026 issue of the Journal of Refractive Surgery," he said.

The algorithm for objective haze quantification developed by Dr Awwad and colleagues is also published in articles appearing in the *American Journal of Ophthalmology*, *Cornea*, and *The Journal of Refractive Surgery*.

Shady Awwad MD is Professor of Ophthalmology and Head of Cornea and Refractive Surgery, American University of Beirut Medical Center, Beirut, Lebanon.

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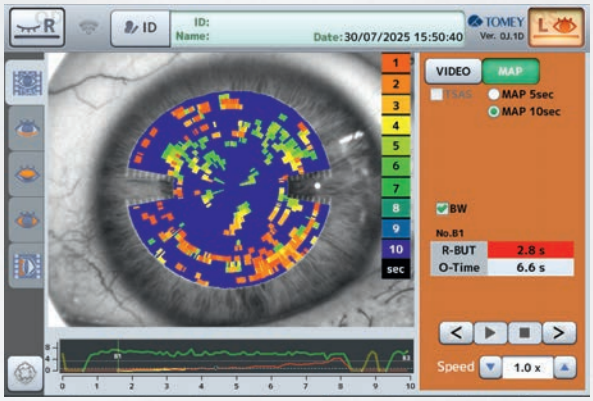

Ocular Surface application

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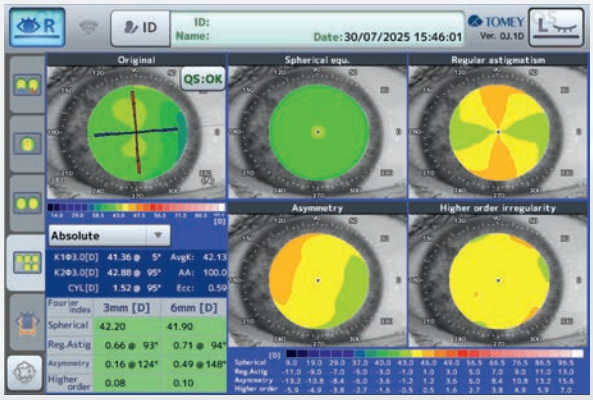

Topography

16 Mire rings examine an area 8 mm in diameter. A number of topography maps, including Fourier analysis, provide a wide range of options for visualising corneal shape.

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Air Pollution Linked to Higher Risk of Glaucoma and Cataract

A large systematic review linking air pollution with ocular disease strengthens the case for clean air policies.

People who live in areas with higher levels of air pollution are more likely to develop glaucoma and cataract, a new study suggests.

"We've known for years that air pollution damages the lungs and heart, but its effects on the eyes have been much less studied, and the existing evidence was scattered and inconclusive," Ahmed Alnabihi MD said.

"Every day, we see patients losing vision to conditions like glaucoma and cataract. These diseases are labelled as 'age related' as though ageing is the only culprit, but that always felt incomplete to me. If something environmental is accelerating these conditions, that changes our thinking and suggests we could take action to reduce the risks."

Dr Alnabihi presented a systematic review and meta-analysis of 41 separate observational studies, drawing on data from millions of people across East Asia and the UK, including some of the world's largest eye health databases.

Researchers analysed the levels of several types of air pollution: particulate matter, nitrogen dioxide, sulphur dioxide, ozone, and carbon monoxide. They compared these with how many people were diagnosed with glaucoma, cataract, or age-related macular degeneration.

Their analysis showed that the higher the levels of fine particulate matter, the greater the risks of glaucoma. People living in the most polluted areas had up to 70% higher odds of glaucoma than those in the least polluted areas. People living in more polluted areas also faced a consistently higher risk of developing cataracts, with risk increasing as pollution levels rose.

"The clearest finding was for fine particulate matter—the tiny particles in smoke, vehicle exhaust, and industrial pollution that are small enough to get deep into the body," Dr Alnabihi said, adding that for every meaningful step up in pollution exposure, the risk of glaucoma rose by around 8% and cataract by around 4%. The evidence for age-related macular degeneration was less consistent, although some of the research supported a link. Other pollutants, including nitrogen dioxide and ozone, showed weaker or more mixed associations.

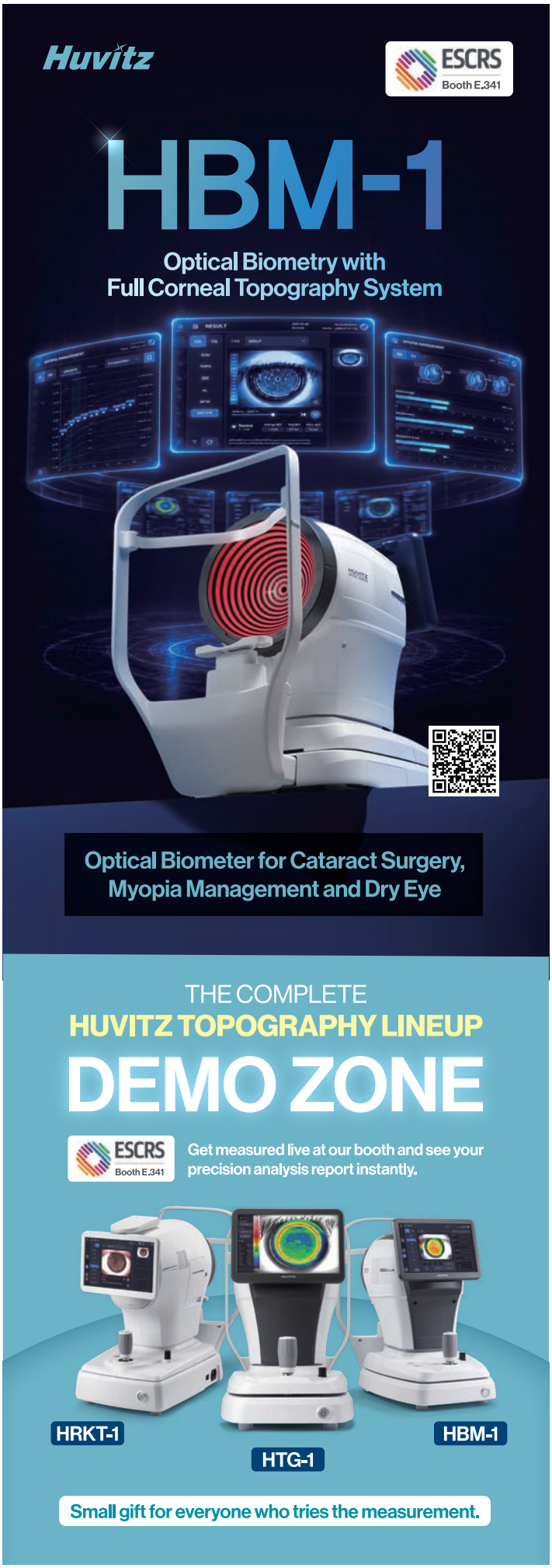
"Fine particles are thought to cause inflammation and

oxidative stress in the body. Over years of exposure, these effects may damage the optic nerve, which is relevant to glaucoma, or the lens, which is relevant to cataract," Dr Alnabihi said. "Unlike most other organs, the eye is directly open to the environment. The ocular surface—the tear film, conjunctiva, and cornea—has no barrier between it and outdoor air. That makes the biological plausibility here stronger than for some other organs."

These findings add weight to the case for tighter air quality standards and pollution-reducing measures such as green spaces and traffic reduction in cities.

"Our paper adds a new organ system to that conversation," Dr Alnabihi said. "Policymakers who need to justify investment in emission controls now have one more evidence-based reason to do so, and it's one that affects our vision—a sense people are particularly afraid of losing."

Ahmed Alnabihi MD practices at the King Khaled Eye Specialist Hospital and Research Center, Riyadh, Saudi Arabia.



ESCRS Expands Masterclass Programs

Applications being accepted for 2027.

For ophthalmic surgeons, the training never ends—there is always a new lens or laser, a new formula, or a new twist on an old surgical technique. ESCRS, through its masterclass program, offers annual opportunities for surgeons to update and enhance their surgical skills in glaucoma, cataract, and now, refractive surgery.

Building on the program's early success, ESCRS supported three masterclasses this year in the clinical areas of interventional glaucoma surgery, complex cataract surgery, and refractive surgery. The program is free for ESCRS members, and organizers attempt to balance the age and experience levels of participants in each class.

This year, 50 positions were made available for students in each masterclass clinical category.Each student learner was assigned to a personal mentor to guide them through the program.

The program allows students to complete exclusive online virtual work in the summer, which takes the form of mentor-guided didactic workshops and interactive live webinars. In addition, students have been able to participate in in-person training during the Congress here in London. This includes in-person case review grand rounds as well as in-person wet labs and workshops. The classes conclude with a dinner celebration.

The new 2026 ESCRS Refractive Surgery Masterclass offers a comprehensive program of instruction. A course of 17 online lectures begins with the history of refractive surgery and the optics of the eye, then follows a sequence of basics, diagnostics, corneal procedures, and intraocular procedures. Students then participated in live sessions at the London Congress, which included case grand rounds and wetlabs.

The goal of ESCRS masterclasses is to improve practice patterns, enhance clinical outcomes, and significantly grow the number of patients treated in each field.

The masterclass course content is designed collaboratively with program directors and mentors, with both online and live materials being updated on a rolling annual basis. In addition to pre-recorded presentations and interactive elements, participants join WhatsApp groups where they can ask questions of mentors.

"The goal of ESCRS masterclasses is to improve practice patterns, enhance clinical outcomes, and significantly grow the number of patients treated in each field," said Dawn Alva, head of engagement and masterclass operations manager.

Applications are now being accepted for the 2027 masterclasses. More information on each masterclass, including eligibility criteria, curriculum details, and instructions for applying, is available at escrs.org/masterclass.

Are You Ready to FEBO?

General and specialty courses are available.

If you have FEBO (Fellow of the European Board of Ophthalmology) after your name, it signifies considerable study and training in general ophthalmology and/or one of several specialties. In addition to recognising your advanced skills and abilities, the FEBO acronym brings a cachet of quality that can enhance career prospects.

The heart of the programme is the European Board of Ophthalmology Diploma (EBOD) examination, which is designed as a test of excellence in general ophthalmology, assessing the knowledge and clinical skills needed for a high standard of ophthalmic care in hospital and independent practice. Successful specialist candidates receive the Fellow of the European Board of Ophthalmology title.

Anyone who is a certified ophthalmology specialist in the EU, Norway, Switzerland, or Türkiye is eligible to sit the EBO exams. Specialists from the UK will be eligible once they are on the General Medical Council Register and receive approval from the EBO.

For young ophthalmologists, FEBO can be a mark of European professional recognition. For subspecialists, FEBOS diplomas offer a way to demonstrate advanced expertise in fields such as retina, cataract and refractive surgery, glaucoma, paediatrics, or oculoplastics, according to Luis Fernández-Vega MD, who was voted head of the EBO alumni by his peers.

The FEBOS-CR exam, for example, is organised by EBO and ESCRS to certify advanced knowledge and expertise in cataract and refractive surgery. ESCRS describes it as intended for independent surgeons with a varied case mix who regularly manage complex cases. Successful candidates earn the FEBOS-CR title.

Founded in 1992 in London, the European Board of Ophthalmology is the permanent working group of the Ophthalmology Subspeciality Section of the European Union of Medical Specialists (UEMS).

For more information on the EBO exams, visit https://www.ebo-online.org/.

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SATURDAY 12TH

9:00 Dan Z. Reinstein
One device. Endless possibilities: The Italian Swiss Army Knife for cornea & anterior segment

9:30 Andrea Russo
Post-cataract aberrometry: making subjective defocus curves more objective

11:00 Giacomo Savini
MS-39: redefining biometry and IOL Calculation

12:30 Farhad Hafezi
ECO-CAIRS: Surgeon-prepared CAIRS for easier insertion, enhanced sterility, and potentially greater effect

SUNDAY 13TH

9:00 Victor Derhartunian
Open-Field aberrometry: beyond myopia control

11:00 Riccardo Vinciguerra
KAI: The next generation of keratoconus screening

13:00 Ivan Gabric
Pyramidal aberrometry: a new perspective on vision quality

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Looks in *London*

Memorable moments from the ESCRS 2026 Congress, capturing key connections and collaborations.

PHOTOS BY

YOFS ARENA:
The Titans of Sustainability
ESCRS

ESCRS Simulation Training Lab

Harold Ridley's Brilliant Innovation

London has been the site of many important innovations in ophthalmology, perhaps none more so than the first intraocular lens.

BY HOWARD LARKIN

"One day, perhaps in 1947, a routine list of operations was performed. At the end, a student who had never before seen a cataract said, 'It's a pity you can't replace the cataract with a clear lens.' He was told that this was not usual, though many people, including myself, had suggested this project. However, no one had the temerity to take action." – Sir Harold Ridley, inventor of the intraocular lens

Following this encounter, Mr Ridley, as he then was, went forward with the first intraocular lens (IOL). He met with John Pike of Rayner and Keeler and, between them, realised the basic ideas of the project. Mr Ridley had been impressed during the Second World War by the apparent lack of inflammation caused by fragments of aircraft clear canopies when found in the eyes of injured crew. Pike asked his friend John Holt of Imperial Chemical Industries in the UK to create clinical quality and hopefully biologically inert polymethylmethacrylate (PMMA).

The design he chose for the first IOL mimicked the shape of the human lens. It was inserted into a patient's eye behind the pupil and hopefully into the capsular bag after an extracapsular cataract extraction. The actual date of the first implantation is not entirely clear. It may have been 29 November 1949, but it was removed and inserted as a secondary operation on 8 February 1950. It produced a gross refractive error of -14 D due to the IOL power calculation conducted in air, not liquid. The error was quickly corrected in subsequent implantations, and the operation promised the first "cure for aphakia," as Harold Ridley put it.

Mr Ridley wanted to keep his invention a secret until he had sufficient clinical data. However, one of his implanted patients, when going for a follow-up visit, went to see another ophthalmologist with the surname Ridley by mistake. With his secret out, Mr Ridley decided to go public at the Oxford Ophthalmological Congress in July 1951. He brought two of his patients, one with 6/6 vision unaided, to the meeting so colleagues could examine them. At the meeting was Sir Stewart Duke Elder, the doyen of British ophthalmology at the time, who refused to look at Ridley's patients or watch the coloured movie of one of the implant procedures. This very negative attitude was mirrored by many senior ophthalmologists across the world.

Lacking haptics for support and weighing many times more than current IOLs, the earliest lenses tended to dislocate, sometimes months or even years after surgery. Despite this, some of the early IOLs continued to give good vision 20 years after implantation. About 15% of Ridley lenses were eventually explanted. Stabilising the implant was a problem that took more than 40 years to adequately solve.

Other frequent complications of early IOL surgery included postoperative infections, haemorrhage, inflammation, corneal oedema, peripheral anterior synechiae, raised intraocular pressure, capsule and lens opacification, and residual refractive error.

Focusing on the problems rather than trying to find solutions, much of the global academic ophthalmic establishment vehemently opposed ocular implants for several decades.

However, the status quo was not acceptable. "Spectacles

for aphakia were horrendous—they magnified and distorted the image, and many patients never really adapted to them. The gross anisometropia made uniocular surgery impossible to rehabilitate," said David J Spalton, who, as a trainee in the mid-1970s, was among the last to assist Harold Ridley in an implant procedure.

Implants restored normal vision, and "there was a lot to be said for that. It was just a matter of getting the design and techniques right for it," Professor Spalton said.

To bring together those interested in lens implantology, Mr Ridley and Peter Choyce, a very early IOL pioneer, formed the Intraocular Implant Club (IIC) in 1966. The founder members of what became the International Intraocular Implant Club (IIIC) came from many countries. In the US, it took another decade before Harold Ridley was recognised for his accomplishments at a meeting of the American Academy of Ophthalmology in 1976. For Mr Ridley, the greatest of all his achievements by way of scientific recognition was admission to The Royal Society of London in 1986. Public recognition eventually came after lobbying of a prime minister's wife when he was knighted in 2000.

Along the way, enterprising surgeons, researchers, and manufacturers made most of the technical innovations. "It was driven by individuals who put a lot of time and thought into the complications and how you would avoid them," Prof Spalton said.

"It's truly remarkable to witness the ongoing evolution of these technologies, underscoring our commitment to providing tailored solutions for each patient's unique visual needs. Continuous progress in the field not only enhances our surgical capabilities but, more importantly, significantly improves the quality of life for those seeking visual correction after cataract surgery," Filomena Ribeiro MD, PhD said.

Advancing IOL design

Early lessons prompted continual improvement in IOL design, said Richard Packard MD. To solve the problem of posterior lens dislocation, Dr Ridley designed anterior chamber lenses, prompting many other surgeons to design angle-supported lenses in the early 1950s.

"Universally, they failed. Not immediately, because there were enough endothelial cells to cope with it, but […] they didn't understand that the edges of the lenses and the haptics were gradually destroying the back of the cornea," Mr Packard explained. Implant pioneers including Dr Joaquin Barraquer in Barcelona ended up explanting half or more of their anterior chamber lenses.

In the late 1950s, Dr Cornelius Binkhorst designed what Mr Packard described as the first 'successful' IOL, the iris-fixated four-loop lens, for use with intracapsular extractions. "He determined that the only way IOLs would work was to be separated enough from vital tissues not to cause problems."

These and similar lenses continued to be implanted until posterior chamber lenses finally overtook them in the late 20th century. Indeed, Mr Packard's first IOL in December 1978 was a Fyodorov Mark 1 iris-fixated lens, implanted at London's Charing Cross Hospital after he served as a senior resident at Moorfields, where he never saw an IOL. The day

Spectacles for aphakia were horrendous—they magnified and distorted the image, and many patients never really adapted to them.

he arrived at Charing Cross, an IOL and phacoemulsification course was underway.

"This was like Saul's conversion on the road to Damascus. I'd never seen anything like it," he said.

Around the same time, Roberto Bellucci MD began doing cataract surgery in Italy, where cryoextraction remained the standard of care until the mid-1980s. "I remember Mr [Eric] Arnott giving a lecture about his lens at my university, but my professor was not convinced. He used to say: 'If the surgery is for your mother, do an intracap! If it is for your mother-in-law, put an intraocular lens in!' It was very hard to overtake this scepticism, and innovation was pushed by doctors working mainly outside the universities, like Lucio Buratto in Milan and Egidio Dal Fiume in Ravenna." In 1985, he implanted his first IOL, a Worst Medallion sutured to the iris.

In the 1960s, Prof Binkhorst pioneered using the capsular bag left behind in extracapsular procedures to stabilise the IOL. His two-loop iridocapsular lens optic sat in front of the iris with haptics anchored in the bag. This eventually led to a resurgence of posterior chamber designs, such as Dr Steve Shearing's 1977 J-loop PC IOL. Based on the Barraquer anterior lens design, it was the first of a new generation of posterior lenses that did not extend into the anterior chamber. The 1960s also saw the introduction of theoretical lens power calculation formulas, pioneered by Prof Svyatoslav N Fyodorov.

Cataract surgery technologies advanced rapidly: This included the invention of phacoemulsification by Charles Kelman, the development of capsulorhexis by Drs Howard Gimbel and Thomas Neuhann, and Prof Robert Stegmann's innovation of viscoelastics. Subsequent innovations included foldable acrylic IOLs, UV blocking IOLs, and toric IOLs. The procedure also became safer with improved anaesthesia and endophthalmitis prophylaxis.

The cumulative impact of all these technologies was a movement away from intracapsular and even extracapsular procedures to phacoemulsification. This reduced hospital stays from several days to overnight and eventually made cataract surgery mainly an outpatient procedure.

On the horizon are accommodative lenses and even robotic surgery, Oliver Findl MD said. Over the course of his career, "the technology has changed, but in the end, it is still a person doing the procedure. I wonder if in 30 years it will still be a person doing it."

This article originally appeared in the February 2024 issue of EuroTimes.

What is the ESCRS?

In part two of this two-part series, *EuroTimes* concludes its conversation with ESCRS CEO Tom Ogilvie-Graham, exploring the Society's future priorities and ongoing initiatives.

What is the ESCRS?In part two of this two-part series, *EuroTimes* concludes its conversation with ESCRS CEO Tom Ogilvie-Graham, exploring the Society's future priorities and ongoing initiatives.

EuroTimes: Is there anything ESCRS is currently developing or investing in that you're especially excited about?

I'm particularly excited by how we're bringing everything together into a more connected experience for members. The ESCRS Learning Hub is a great example. Rather than education existing across different platforms, we're creating a single place where members can access courses, Congress sessions, surgical videos, webcasts, and CME-accredited learning whenever it suits them. We're also continuing to strengthen our clinical registries and invest in research because good evidence is fundamental to improving patient care. Ultimately, we're building an organisation that supports ophthalmologists every day of the year, not just during our Congress.

When you think about the value of ESCRS membership, is there a conversation or piece of feedback from a member that has stayed with you?

One comment I hear regularly comes from members who say they originally joined because of the Congress but stayed because they discovered everything else the Society offers. That's incredibly rewarding because it's exactly the journey we're trying to create.

Membership isn't just about attending one event. It's about belonging to a professional community that supports each member through education, research, publications, networking, and opportunities to become involved in the life of the Society. When someone tells me ESCRS has played an important role in their professional development, that's when I realise the real impact membership can have.

That willingness to give back is one of the defining characteristics of ESCRS and one of the reasons the Society continues to evolve.

One of ESCRS's strengths is bringing together surgeons, trainees, researchers, and educators within one community. Why do you think that diversity of perspectives matters?

The best ideas rarely come from one group working in isolation. Experienced surgeons bring decades of practical knowledge. Researchers contribute new evidence. Trainees bring fresh perspectives and ask questions that challenge established thinking. Educators help turn knowledge into better clinical practice.

One of the things I'm most proud of is seeing those different perspectives come together within ESCRS.

Many of those individuals also volunteer their time to serve on our committees, helping to shape our educational programmes, scientific activities, and strategic priorities. That willingness to give back is one of the defining characteristics of ESCRS and one of the reasons the Society continues to evolve.

If you had five minutes with a young ophthalmologist who was unsure whether to join ESCRS, what would you want them to know before they made that decision?

I'd encourage them to think beyond where they are today and consider where they want to be in ten or twenty years. Technical skills are obviously essential, but so are the people we learn from, the community we're part of, and the opportunities we create for ourselves.

Joining ESCRS isn't simply about accessing benefits. It's about becoming part of an international community that's committed to helping each other learn, collaborate, and advance the profession.

Whether their ambition is to become a better surgeon, contribute to research, develop as a leader, or simply stay at the forefront of ophthalmology, ESCRS can help them on that journey.

Looking ahead five to ten years, what do you hope people will say ESCRS has achieved for the profession?

I hope they'll say ESCRS helped make world-class education more accessible, strengthened the evidence that underpins clinical practice, and brought the international ophthalmic community closer together. I'd also like people to recognise that we've continued to invest in the next generation of ophthalmologists and created opportunities for them to learn, collaborate, and lead.

Ultimately, success isn't measured by the size of the Society or the number of people who attend our events. It's measured by whether we've helped improve patient care by supporting the people who deliver it.

Finally, is there anything we haven't covered that you'd like people to understand about ESCRS or its future?

I'd simply say that ESCRS belongs to its members. Behind every committee, educational programme, Congress session, publication, research initiative, and fellowship is an extraordinary group of volunteers who generously give their time, expertise, and leadership to strengthen the profession.

Our role as the executive team is to support that expertise, provide the infrastructure, and create opportunities for the community to have an even greater impact.

As ophthalmology continues to evolve, so will ESCRS. We'll continue investing in education, research, innovation, and international collaboration because that's how we help ophthalmologists provide the very best care for their patients.

That's a future I'm incredibly excited to be part of.

Refractive Patients Have High Expectations

Large study characterises contemporary drivers behind cataract and refractive surgery choices.

CHERYL GUTTMAN KRADER REPORTS

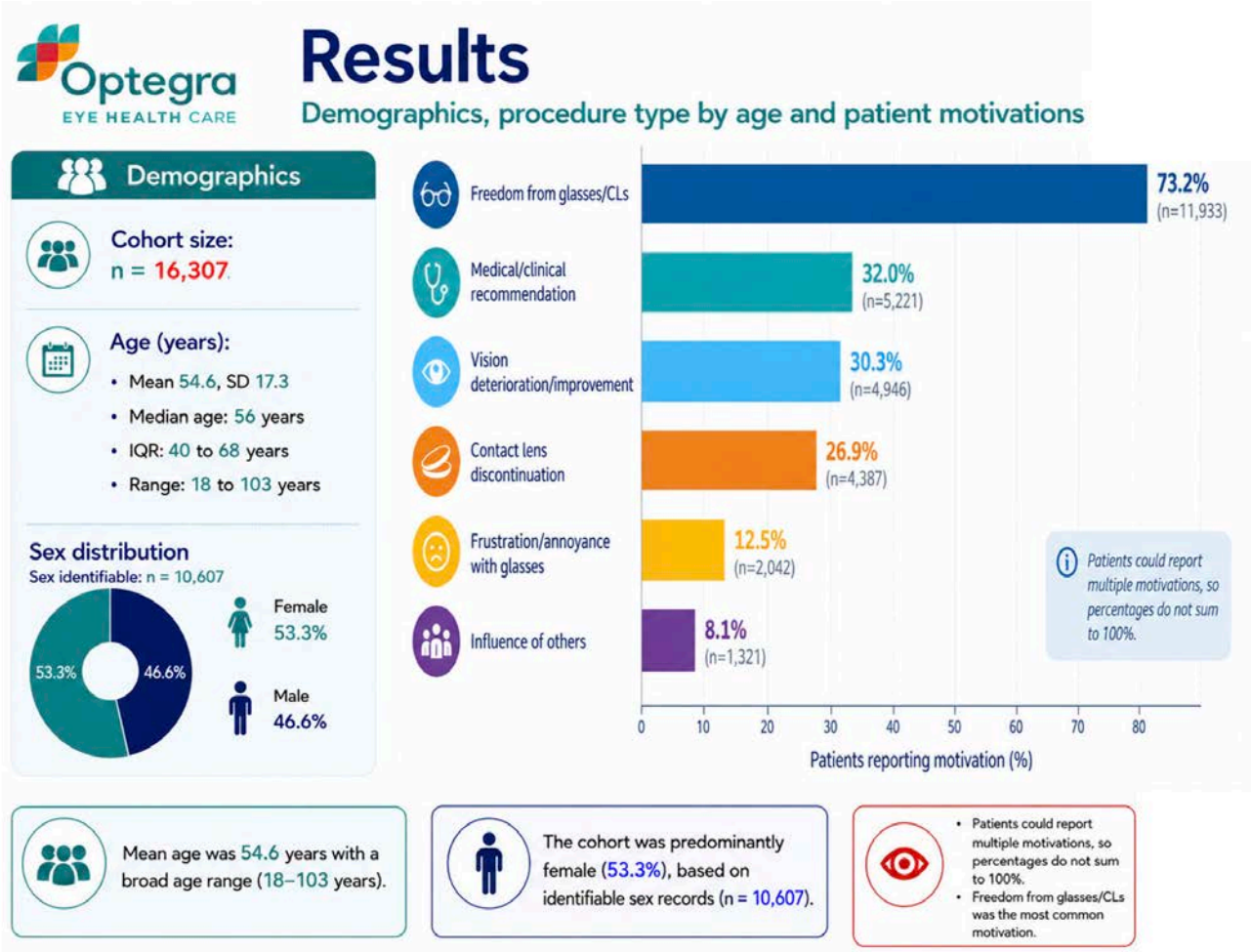
Findings of a large multicentre study assessing patient motivations and suitability for cataract and refractive surgery underscore the importance of conducting patient-centred consultations. These consultations should address clinical and lifestyle expectations within digital care pathways to ensure informed decision making and optimised patient satisfaction postoperatively, concluded researchers from UK Optegra Eye Health Centres.

The research analysed information from 16,307 patients who participated in a virtual consultation with an optometrist.

"Refractive surgery can improve visual function and quality of life by reducing dependence on spectacles or contact lenses. However, the decision to undergo an elective surgical procedure is rarely based on visual acuity and refractive error alone," said Clare O'Donnell PhD. "Patients may be motivated by practical, occupational, lifestyle, psychological, and social considerations, and the relative importance of these factors is likely to vary according to age, visual requirements, experience of alternative methods of refractive correction as well as the procedures being considered.

Our data showed that patient-driven lifestyle preferences, particularly the desire for appliance independence, were key motivators for patients considering refractive surgery.

"As providers we naturally spend a lot of time reviewing our patient suitability criteria, optimising our pathways,



refining our procedures, and assessing the safety and efficacy of the surgery. We arguably spend less time thinking about what brings patients to see us in the first place. Since there have been changes in both visual needs relating to an increased reliance on digital technology and in our procedure offerings since much of the previous research on this topic was published, we conducted this study to improve our understanding of what currently motivates people to explore surgical options for refractive correction."

The study involved a retrospective audit of patients who attended a virtual consultation because they were considering refractive laser, phakic IOL, or cataract surgery. Free text motivation statement data were extracted from the consultation notes and analysed using Python. Motivation statements were summarised and stratified by age, sex, procedure type, and contact lens use. The 16,307 patients ranged in age from 18 to 103 years (mean was approximately 55 years), and 53% were female.

The analyses showed that desire for freedom from glasses or contact lenses was the most frequently reported motivation (73.2%), followed by clinical recommendation (32.0%), vision deterioration/need for improvement (30.3%), and contact lens discontinuation (26.9%). However, motivations for exploring surgical options for refractive management varied by age, procedure, and contact lens experience. Contact lens discontinuation predominated in patients younger than 40 years old, while spectacle independence and clinical need became increasingly important in older age groups. Clinical recommendation was frequently cited as a motivation in IOL surgery patients (65.7%). Among patients wishing to cease contact lens wear, the main reasons given were a desire for lens independence, problems with dry eye, poor visual performance, and difficulty handling lenses.

"Our data showed that patient-driven lifestyle preferences, particularly the desire for appliance independence, were key motivators for patients considering refractive surgery," Professor O'Donnell concluded. "Spectacles, contact lenses, and surgery are options that exist throughout the patient's refractive lifecycle. Better understanding clinical need and lifestyle preferences throughout our patients' journeys may allow us to better support decision making through informed and individualised counselling, expectation management, and treatment selection, whatever option is ultimately chosen."

Clare O'Donnell BSc (Hons), PhD, MBA, MCOptom is Head of Eye Sciences at Optegra Eye Health Care and Reader at Aston University, Birmingham, UK.

Increased Depth of Focus Without the Downsides

Enhanced monofocal IOL shows strong clinical performance in real-world study.

CHERYL GUTTMAN KRADER REPORTS

In a real-world multicentre study of patients undergoing cataract surgery, bilateral implantation of a partial-depth-of-field enhanced monofocal IOL (enVista Aspire/enVista Aspire toric, Bausch + Lomb) resulted in high levels of spectacle independence at far and intermediate distances along with some functional near vision—without causing significant dysphotopsia.

"It is a pleasure to share these data from a study involving a large number of surgeons and subjects with characteristics representative of the broad pool of patients encountered in routine practice," said Cathleen McCabe MD.

"The results of this study indicate that surgeons can take advantage of this advanced optics IOL that gives more functionality than a conventional monofocal IOL without the downsides that can occur with full range of vision lens technologies."

Available in the US since 2023 and in Europe since 2025, the Aspire family of IOLs combine the benefits of the enVista platform, notably its glistening-free hydrophobic acrylic material and in-the-bag stability, with a unique optical design that broadens the depth of focus to intermediate distances while minimising dysphotopsias. It is an aberration-neutral lens with higher-order aspheric coefficients on the posterior aspheric surface that create a small, continuous increase in IOL power within the central 1.5-mm diameter while gradually distributing light energy.

"A monocular defocus curve for the enVista Aspire shows approximately 1.50 D of continuous depth of focus for a visual acuity of 0.2 logMAR or better," she said. "And, the toric version is a great platform for minimising residual astigmatism because it is available in cylinder powers down to +1.25 D at the IOL plane in the US (+0.9 D internationally), allowing us to treat the large group of patients with low levels of astigmatism who could benefit from the predictable correction achievable with a toric IOL."

The real-world study was conducted at 57 US sites. A total of 310 subjects (620 eyes) comprised the per protocol analysis series including patients who completed the study after undergoing bilateral surgery and without any major protocol deviations. Eligible patients had preoperative corrected distance visual acuity (CDVA) of 20/40 or worse bilaterally, with or without glare, and projected postoperative CDVA better than 20/20, with refractive errors (spherical equivalent and corneal astigmatism) correctable with the available IOL powers.

The results showed excellent refractive predictability with a mean manifest refraction spherical equivalent of -0.18 ± 0.37 D. In eyes implanted with a toric IOL (n = 326), 83% achieved residual refractive cylinder ≤0.50 D postoperatively.

Binocular uncorrected visual acuity was ≥20/32 in 96.5% of patients at far and in 71% at intermediate. Visual acuity at near was not an endpoint, but questionnaire responses showed >50% of subjects had no or little difficulty doing near vision tasks without spectacles and at least 70% could see the display on their computer/mobile phone, close objects, or read/write their own handwriting with no or little difficulty.

"Based on the low residual refractive error and the fact that uncorrected and distance corrected intermediate visual acuity were almost the same, we can conclude that myopia was not driving near vision performance," Dr McCabe said

Patient-reported outcomes showed vision was rated 'good to excellent' at far by more than 96% of patients and at intermediate by 86%; 93% of patients said they could see 'pretty to perfectly well without glasses'; and 90% were 'completely to somewhat satisfied' with their vision.

Cathleen McCabe MD presented at an EU Clinical Trial Spotlight session. She practices with The Eye Associates, Bradenton and Sarasota, Florida, US.

Exclusive learning. Unlimited access for ESCRS members.

The new ESCRS Learning Hub brings together courses, surgical videos, Congress sessions, and CME-accredited eLearning in one integrated platform, giving members seamless access to trusted, premium ESCRS education all year long.

Predicting Possible Cataract Outcomes

Can preoperative aberrometry and straylight measurement help?

SEAN HENAHAN REPORTS

The current indication for cataract surgery relies on patient-reported complaints, visual acuity, and slit lamp assessment. However, preoperative visual acuity has been shown to be a poor predictor of surgical outcome, and no tool reliably predicts which patients will experience meaningful functional improvement with surgery.

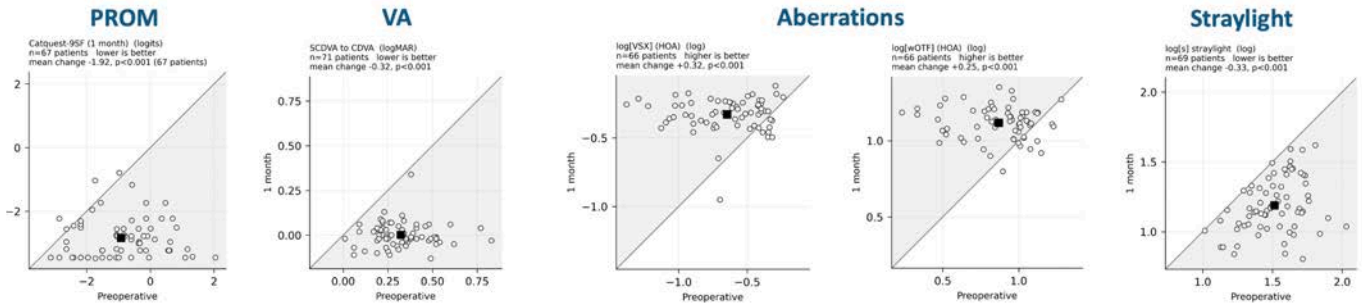
The primary indication for cataract surgery is a loss of visual function that interferes with daily activities due to lens opacities. If surgery is not expected to improve visual function, it should not be performed, notes Nic J Reus MD.

Cataract surgery has a high overall success rate, with 90% of patients reporting an improvement in their visual function. But what about the other 10%? With more than five million cataract surgeries performed in the EU each year, this means 500,000 patients do not report an improvement in visual function after surgery.

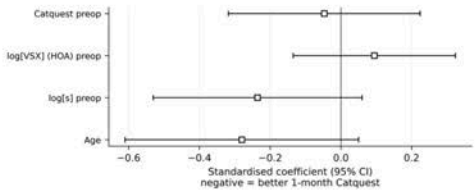
"This is more than the population of Iceland," he said. "Even this modest dissatisfaction rate produces the largest affected group of any elective procedure in Europe."

Cataract degrades optical quality through two independent mechanisms that have never been combined to predict outcomes—aberrations and straylight. Dr Reus and his colleagues in the ophthalmology department at the Amphia Hospital in Breda, Netherlands, conducted a study to determine whether objective optical quality metrics—such as aberrometry and straylight measurement—could provide a more direct measure of lens-induced optical degradation, independent of subjective reporting.

Changes with cataract surgery



→ PROM, VA, aberrations, and straylight all improve statistically significantly with cataract surgery.



Predictor	β (logits)	95% CI	P
Preop Catquest-9SF, per logit	-0.02	-0.17 to 0.12	0.74
log(VSX), per log unit	0.22	-0.31 to 0.74	0.42
log(s), per log unit	-0.73	-1.64 to 0.19	0.12
Age, per 10 years	-0.23	-0.50 to 0.04	0.10

→ None of the preop measures predicts the postop Catquest-9SF score; all confidence intervals include zero.

The study evaluated 53 patients who underwent preoperative and one-month postoperative aberrometry (iTrace, Tracey Technologies) and straylight measurement (C-Quant, Oculus) in both eyes. Aberrometry was expressed as the log of the visual Strehl ratio, an optical metric that incorporates an age-related neural contrast sensitivity function at 900 trolands. Straylight was expressed as logs.

Cataract degrades optical quality through two independent mechanisms that have never been combined to predict outcomes—aberrations and straylight.

The researchers also assessed visual function with the Catquest-9SF questionnaire before and after surgery. They measured uncorrected (UDVA), corrected (CDVA), and spectacle-corrected distance visual acuity (SCDVA).

A linear mixed-effects model (random intercept for patient) assessed whether preoperative log[VSX], log[s], baseline Catquest-9SF score, and age predicted the postoperative Catquest-9SF Rasch score.

Cataract surgery significantly improved mean visual acuity. SCDVA improved from 0.32±0.18 preoperatively to 0.29±0.18. UDVA and CDVA improved by similar degrees. Aberrations also showed statistically significant improvement in all measures ($P < 0.0001$).

Patient-reported visual function also improved significantly. Mean Catquest-9SF Rasch score changed from -1.10±1.25 to -2.86±0.70 ($P < 0.0001$). In a linear mixed model adjusted for preoperative Catquest-9SF, log[VSX], log[s], and age, only age independently predicted postoperative patient-reported outcomes.

None of the preoperative measures predicted the postoperative Catquest-9SF scores. Catquest scores clustered at the questionnaire ceiling, leaving little variance to predict outcomes, Dr Reus noted.

"These findings indicate that the relationship between measured optical degradation and postoperative patient-reported visual function is not straightforward," Dr Reus concluded. "Further research is needed to better understand how objective optical metrics relate to patient-reported outcomes."

Don’t Miss!

Digital Operating Room: Don’t Miss Today’s IME Forum!

Join today’s ESCRS Independent Medical Education Forum exploring how the Digital Operating Room is transforming cataract surgery through integrated diagnostics, AI, 3D visualisation, and connected workflows.

Discover practical strategies for improving precision, ergonomics, safety, and surgical outcomes with a real-world case, insights from the latest ESCRS Clinical Trends Survey, and an expert panel on implementing digital technologies in everyday practice.

Victoria Room 3
Monday, 14 September 2026
13:00–14:00 BST

Chaired by Drs Filomena Ribeiro and Bruce Allan, with faculty Drs Morten Gundersen, Lukan Mishev, and Seth Pantanelli.

Discover how digital technologies can enhance cataract surgery and support their successful integration into clinical practice.

DON'T MISS TUESDAY

Don’t miss Tuesday’s UKISCRS Symposium, ‘Addressing the Anterior Segment in 2026.’

Presentations include the following:

- Drop-free bilateral cataract surgery: the new gold standard?
- Making sense of the cyl: controversy and clarity with toric IOLs
- Managing cataract in eyes with previous glaucoma surgery
- Big things happen in small spaces
- Presbyopia correction in patients with previous corneal refractive surgery
- Lenticule extraction: still SMILE-ing?

Victoria Room 5/6
8:30-10:00 a.m.

Meet.
Connect.
Refresh.

The ESCRS Member Lounge is the place where conversations happen and connections grow.

Located in the middle of the Exhibition Hall, the lounge is a vibrant and highly visible hub designed to bring the ESCRS community together to connect, collaborate, and unwind.

ESCRS

EUROPEAN SOCIETY OF CATARACT & REFRACTIVE SURGEONS

Experience the heart of ESCRS at the Member Lounge.

Annual ESCRS Clinical Trends Survey Underway: Your Participation is Essential

Survey participants will be entered into a raffle to receive a free registration for the 2027 ESCRS Annual Congress in Madrid.

The 12th annual ESCRS Clinical Trends Survey has been launched at the 2026 Annual Congress in London. This survey builds on the success of prior surveys, which have more than 19,000 participants to date.

The survey asks ESCRS members key questions about the issues they face in practice, with the goal of gathering input from a significant proportion of members for review by ESCRS leadership. Building on the 2025 edition, the 2026 survey adds questions on evolving clinical and technological areas, such as retina.

Data from previous surveys shaped much of the content for this year's ESCRS Clinical Forum Independent Medical Education programmes, and results from the 2026 survey will guide future programming and identify new areas of education.

The 2026 ESCRS Clinical Trends Survey includes a wide range of contemporary topics, such as:

- Cataract extraction
- Presbyopia correction
- Astigmatism management
- Ocular surface disease
- Glaucoma
- Corneal- and lens-based refractive surgery
- Retina
- Medical education

How to participate

The survey can be completed in person at the ESCRS Annual Congress in London at the Survey Lounge, located in the Exhibition Area Hall across from the ESCRS booth. The lounge will be open 11–13 September and will provide seating and complimentary refreshments. If you are unable to complete it during the Congress, we encourage you to take this 15-minute survey at tfgedu.questionpro.com/ESCRS2026. Please respond as soon as possible, as the survey closes in October.

By completing the survey, and supplying an email address, respondents will be entered into a raffle to win free registration for the 2027 ESCRS Annual Congress in Madrid. Most importantly, responses provide the data that drives future education programming. Respondents who prefer to remain anonymous can still complete the survey and provide ESCRS with valuable feedback.

Be a Pioneer in Clinical Research

Apply now for the ESCRS Pioneer Research Award

The ESCRS Pioneer Research Award (PRA) aims to support and encourage independent clinical research in the field of cataract and refractive surgery.

The award competition is open to ophthalmologists up to the age of 45 (at the application deadline). Eligible participants must hold a full-time clinical or research position at a clinical or academic centre within the European region.

Purpose of the Award

The Pioneer Award aims to fund various new initiatives, which may include:

- a novel research idea for the development of clinical trial studies;
- a non-interventional or observational study;
- a natural history/epidemiological study;
- a comprehensive series of retrospective case-control studies; or
- a patient or disease registry.

Successful applicants may receive up to €50,000 for a single project with a duration no longer than two years.

A PRA application requires clear reference to a current systematic review and meta-analysis, if available, published on the topic of which the applicant wishes to apply. The supervision of an established researcher is required by ESCRS.

Only one application per lead investigator will be accepted. Should more than one application be submitted, all will be rejected unless the programme lead specifies which to keep in peer review.

Application Deadline: 24 September 2026

ESCRS

EUROPEAN SOCIETY OF CATARACT & REFRACTIVE SURGEONS

NOTES

Vision to Venture

An **ESCRS** Programme

Turn your clinical expertise into business success.

A new ESCRS programme for ophthalmologists looking to build, grow and lead successful businesses.

WEEKEND ONE

Business & Financial Planning

30 OCTOBER – 01 NOVEMBER 2026

Budapest, Hungary

NEW

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MEDICAL DEVICE REGULATION EU-MDR CERTIFICATION

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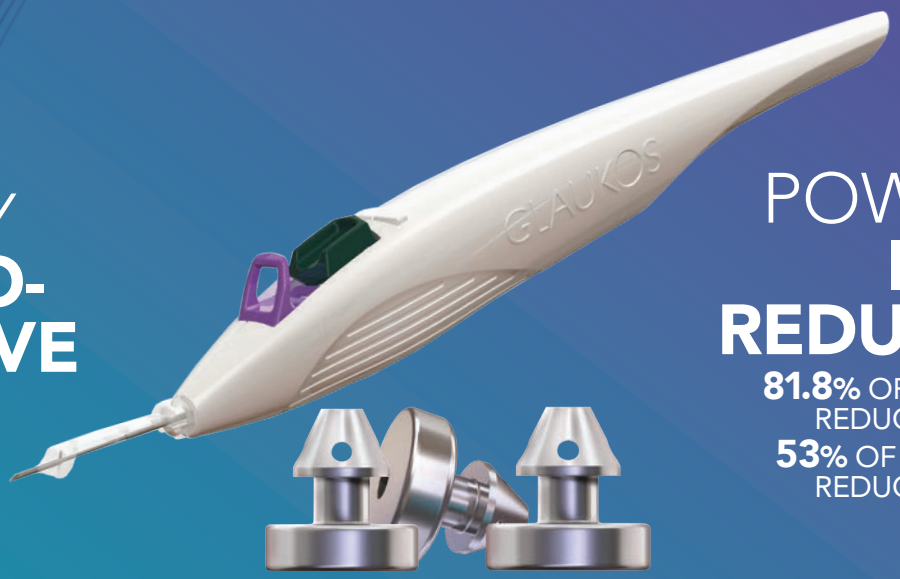

POWERFUL IOP REDUCTIONS[1]

81.8% OF PATIENTS ≥20% REDUCTION IN IOP

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TMB® TRABECULAR MICRO-BYPASS

GLAUKOS

1-Sarkisian Jr, Steven R., et al. "Effectiveness and safety of iStent infinite trabecular micro-bypass for uncontrolled glaucoma." Journal of glaucoma 32.1 (2023): 9-18.

iStent infinite® IMPORTANT SAFETY INFORMATION

INDICATION FOR USE: The iStent infinite System is intended to reduce intraocular pressure safely and effectively in adult patients diagnosed with primary open-angle glaucoma, pseudo-exfoliative glaucoma or pigmentary glaucoma. The device is safe and effective when implanted in combination with or without cataract surgery in those subjects who require intraocular pressure reduction and/or would benefit from glaucoma medication reduction. The device may also be implanted in patients who continue to have elevated intraocular pressure despite prior treatment with glaucoma medications and/or conventional glaucoma surgery. **CONTRAINDICATIONS:** The iStent infinite System is contraindicated under the following circumstances or conditions: •In eyes with primary angle closure glaucoma, or secondary angle-closure glaucoma, including neovascular glaucoma, because the device would not be expected to work in such situations.• In patients with retrobulbar tumor, thyroid eye disease, Sturge-Weber Syndrome or any other type of condition that may cause elevated episcleral venous pressure. **WARNINGS/PRECAUTIONS:** • For prescription use only. • Intended users are trained ophthalmologists only. • This device has not been studied in patients with uveitic glaucoma. • Do not use the device if the Tyvek® lid has been opened or the packaging appears damaged. In such cases, the sterility of the device may be compromised. • Due to the sharpness of certain injector components (i.e., the insertion sleeve and trocar), care should be exercised to grasp the injector body. Dispose of device in a sharps container. • iStent infinite is MR-Conditional • Physician training is required prior to use of the iStent infinite System. • Do not re-use the stent(s) or injector, as this may result in infection and/or intraocular inflammation, as well as occurrence of potential postoperative adverse events • There are no known compatibility issues with theiStent infinite and other intraoperative devices (e.g., viscoelastics) or glaucoma medications. • Unused product & packaging may be disposed of in accordance with facility procedures. Implanted medical devices and contaminated products must be disposed of as medical waste. • The surgeon should monitor the patient postoperatively for proper maintenance of intraocular pressure. If intraocular pressure is not adequately maintained after surgery, the surgeon should consider an appropriate treatment regimen to reduce intraocular pressure. • Patients should be informed that placement of the stents, without concomitant cataract surgery in phakic patients can enhance the formation or progression of cataract. **ADVERSE EVENTS:** The most common postoperative adverse events reported in the iStent infinite pivotal trial included IOP increase ≥ 10 mmHg vs. baseline IOP (8.2%), loss of BSCVA ≥ 2 lines (11.5%), ocular surface disease (11.5%), perioperative inflammation (6.6%) and visual field loss ≥ 2.5 dB (6.6%). **CAUTION:** Please see DFU for a complete list of contraindications, warnings, precautions, and adverse events.

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