July / August 2024
#74

the Ophthalmologist®

The Art of Eyes

Presenting our 2024 collection of the finest images, illustrations, and paintings produced by practitioners working in the field.

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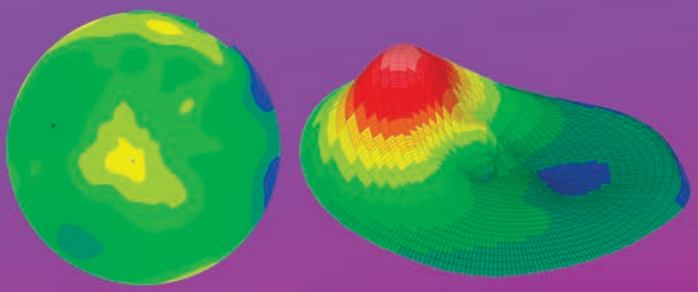

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DECIPHER THE SECRETS OF PREMIUM IMPLANTS
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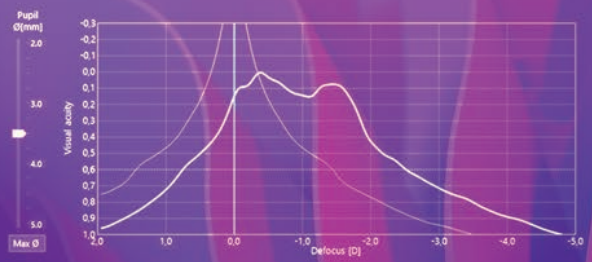

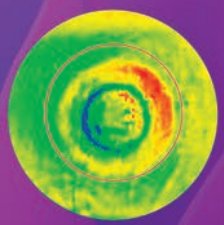

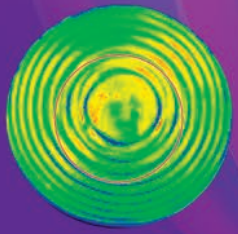

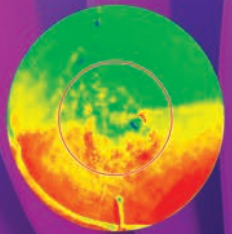

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The Art of Eyes 2024

This year's collection of ophthalmology-inspired images shows the profession's creative streak is as strong as ever

Ten years ago we published the inaugural edition of "The Art of Eyes," which, among other things, demonstrated recent advancements in imaging technology. The issue's cover depicted a cluster of nascent retinae generated from 3D embryonic stem cell cultures. It was an homage to the beauty of the eye and the progress made from when the human retina was first photographed 128 years earlier.

Much has changed, even since 2014. The impact of artificial intelligence is arguably at its tipping point, many new products have been launched, and there have been notable improvements in the scope of practice. As for "The Art of Eyes," we have broadened our horizons to a format more akin to a gallery, including illustrations, paintings, photography, digital images, and other forms of visual creative expression from ophthalmologists and ophthalmic practitioners.

In the world of the professional, the idea of artistry might be undermined by the notion that it is not a "serious" pursuit. But art, of course, can provide plenty of enrichment. A 2017 study from the American Academy of Ophthalmology identified that 86 percent of practicing US ophthalmologist members were very satisfied with ophthalmology as a career choice. And as the works submitted to us show, a practitioner can love the discipline of their profession while also drawing on art for more personal goals. For some, it is a personal pleasure; for others, it's an education. Often, it is both.

Jamie Irvine,
Associate Editor

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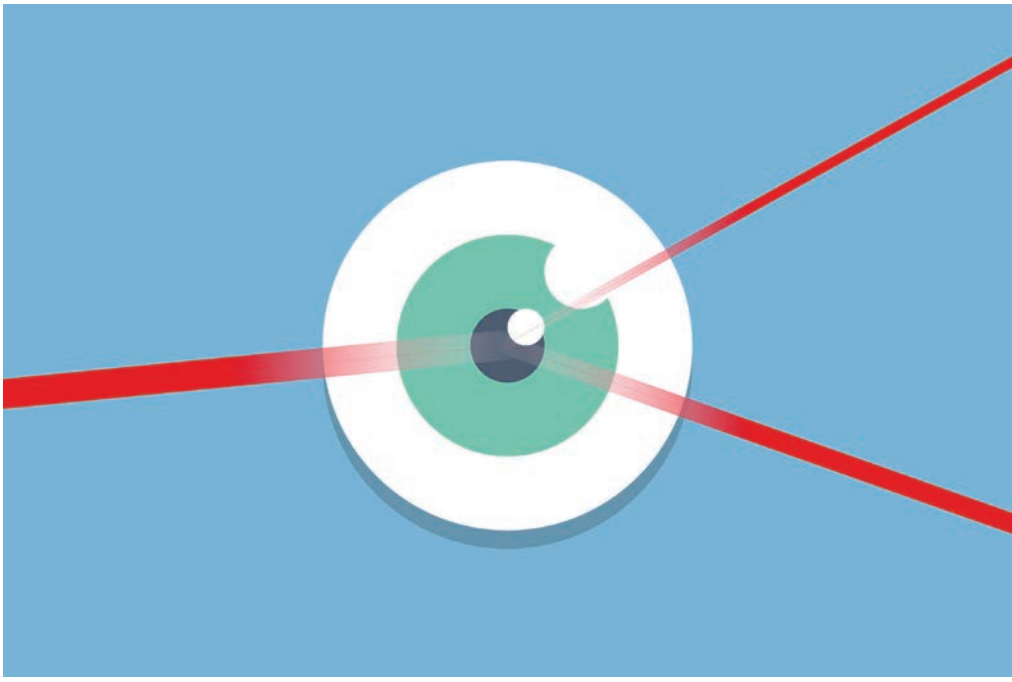
Landmark nAMD Treatment

Could robot-assisted radiotherapy offer a new treatment choice for neovascular age-related macular degeneration?



For the majority of patients, neovascular age-related macular degeneration (nAMD) demands long-term management of the condition. Existing literature notes that the current cornerstone treatment for nAMD – intravitreal injections of anti-VEGF agents, such as aflibercept, ranibizumab, or off-label bevacizumab, given roughly every one-to-three months – can be slightly more effective than a pro re nata (PRN) injection regimen (1).

But what if there was a way to further cut down intravitreal injection frequency for patients?

Well, now there might just be: a research team at King's College London has successfully tested a custom-built, robotically controlled device that administers three beams of highly focused overlapping radiation at the macula of patients.

In a randomized, sham-controlled trial designed to test efficacy of the device (2), the researchers enrolled 411 participants between 2015 and 2019, with 274 receiving the stereotactic radiotherapy (SRT) treatment and 137 receiving the sham treatment. The study, published in The Lancet, reported a 22 percent reduction in the number of ranibizumab injections required in the SRT patients; the researchers estimate that these results indicate that the innovative treatment could potentially save 1.8 million injections per year globally.

"The key attraction [of SRT] is that it doesn't involve an intravitreal injection and can be delivered in a simple, one-off, outpatient procedure," explains study lead Timothy Jackson, a consultant ophthalmic surgeon at King's College Hospital, London. "[And] it only needs to be delivered once, so thereafter we do not rely on patient compliance to drive efficacy."

Even taking into account the cost of SRT treatment, in the UK (where the study was conducted) the reduced dosing of ranibizumab led to net cost-savings of around £565 per patient over a two-year period.

Whereas The Lancet study focused exclusively on how ranibizumab anti-VEGF agent injection frequency is affected by SRT, Jackson states that "On biological principles, we would anticipate that [SRT] works with other anti-VEGF agents, but without data to prove that we need to be circumspect in asserting that is definitely the case." In terms of next steps for the team, he notes that "After year 2 participants revert to standard care. However, they and investigators remain masked, so we will be able to collect robust real-world data out to year 4. That will be really useful data as it allows us to look at the durability of treatment effect, long-term safety, and how the treatment performs off trial."

When it comes to the global future of the SRT device, Jackson is optimistic about their development, but remains cautious about its broader implications: "Research has previously tried to find a better way to target radiotherapy to the macula… but so far nothing has been sufficiently precise to target macular disease less than 1 mm across. With this purpose-built robotic system, we can be incredibly precise. However, the positive and negative effects of radiation can manifest over a long time horizon, so it will be important to review the year 3 and 4 data before advocating widespread adoption."

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Explorers of Darkness

A drawing selected from The Museum of Optography, which, at its core, focuses on 'The Last Image' bleached onto the retina at the moment of death. Here, a group of explorers mount their way through the inner-retina.

Credit: Derek Ogbourne, Fine Artist and Founder of the Museum of Optography: *http://museumofoptography.net/*

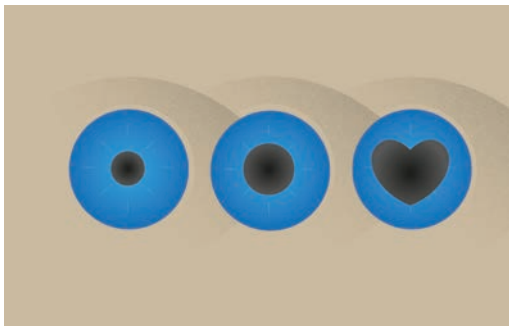
QUOTE *of the month*

"First, identify your ideal patients and the problem you want to solve. Understand their demographics, needs, preferences, fears, frustrations, wants, and aspirations. Choose one avatar and one problem to solve. Avoid trying to solve many problems for different people."

Rod Solar, "Sixteen Weeks to Launch" *(top.txp.to/sixteen/weeks/to/launch)*

Beauty in the Iris

New Cognition study reveals how pupil size can impact a person's perceived attractiveness



Prompted by the idea that "beauty brings many social benefits," researchers have investigated how pupil size can affect a person's attractiveness.

"The primary goal of this study is to conclusively determine whether constricted pupils – compared to dilated pupils – enhance perceived attractiveness," explains study author Martina Cossu.

The team enrolled over 3,000 participants, asking them to judge pairs of photos using a slider scale from 0 ("very unattractive") to 100 ("very attractive"). The paired photos, although identical in every other way, were manipulated so that in one photo the models had constricted pupils, and in the other dilated pupils.

The findings indicate that "constricted pupils enhance physical attractiveness by making the eyes appear brighter," confirms Zachary Estes, a co-author of the study.

Reference

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Verifying Your Vision and Values

The importance of a vision statement – and how the concept influenced this year's inaugural Ophthalpreneurs meeting

By Bernie Haffey, President and Founder of Haffey&Co.

In April 2024, I had the pleasure of leading a Vision and Values workshop at the Ophthalpreneurs meeting in beautiful Stresa, Italy. This short article summarizes the session, which was executed in less than one hour – a true sprint!

Vision

The subject of the session was "Why my organization should create a vision statement." Briefly, a vision statement is a concise, memorable, and aspirational statement describing your organization's long-term goals. It represents a visible future state, and is often written in future tense. It can present bold claims which, over time, the organization can defend and ultimately own. Vision statements can be audacious – sometimes they are written by organizations who have no present right to the claim their statement makes. But ultimately, they help to guide an organization's decisions and actions.

We can break a vision statement down into superlative and descriptor components. The Ritz-Carlton hotel chain positions its vision, for example, as "To be the premier worldwide…" (superlative) "provider of luxury travel and hospitality products and services" (descriptor).

Why do you need a vision statement?

Briefly, a well-constructed vision statement can facilitate:

Organizational alignment. Well-constructed vision statements enhance alignment of functions and individuals to a defined future state or destination.

Employee engagement. Well-constructed vision statements engage and motivate team members and affiliates in a common purpose and direction. Employees who understand the organization's long-term goals are proven to be more motivated and likely to remain with your organization.

Decision making. Good vision statements guide decisions and actions (for example, is scenario A or scenario B more likely to achieve our vision?)

Strategic marketing. An effective vision statement can strengthen your position in the marketplace. Here, you should think in terms of making a bold claim to own a market or segment of a market, which you will defend and, over time, own.

At the Stresa workshop, attendees sought to create a vision statement for Ophthalprenuers itself. A pre-meeting survey identified strong words in "global", "community," and "entrepreneurship." From there we fashioned five options, from which this vision statement was chosen:

"Ophthalpreneurs: The global community driving business innovation and entrepreneurship in private ophthalmology."

"A vision statement is a concise, memorable, and aspirational statement..."

Values

With the vision statement accomplished, an organization should agree on a set of shared values. Having shared values will help a company to:

- set expectations for behaviors necessary to achieve your vision
- shape your culture, which can become a competitive advantage
- align teams around a common language that improves speed and efficiency
- provide higher quality products and services at lower cost
- simplify the process of hiring, firing, and awarding promotions

The session in Stresa was rewarding and enjoyable as a very rapid introduction and application of these critical elements. I am sure that Ophthalpreneurs – as it absorbs and refines the lessons above – will continue to go from strength to strength!

Securing a Green Future

It might pay to stop to think about the logic of ophthalmic regulations that stifle sustainability

By John Hovanesian, cataract and cornea specialist at Harvard Eye Associates in California.

According to a 2020 survey of over 1300 eye surgeons and staff members, a staggering 93 percent of our peers believe that we waste far too much packaging and materials in eye surgery. And yet, within our profession, our ability to make any type of real headway towards sustainable practices is impeded by regulatory and psychological barriers.

One common barrier to sustainability in ophthalmology manifests itself as inertia – the feeling that "We have always done things this way and always will." This inertia is then bolstered by a fear of regulations and red tape. But of whose regulations are we so fearful? For US practitioners, regulators include the FDA, the Centers for Medicare and Medicaid Services (CMS), the Association of periOperative Registered Nurses (AORN), and the Accreditation Association for Ambulatory Health Care (AAAHC). On top of these, we might also be wary of policies put in place by the American National Standards Institute (ANSI) and the International Organization for Standardization (ISO).

These regulatory bodies' rules can often be viewed as gospel – unimpeachable and held up by faith alone. But the fact is that many rules set to govern medicine-based practices are often rooted in non-evidence based medicine.

So, what if we stop to think about the logic of regulations that are currently stifling sustainability?

To date, EyeSustain – an international cooperative of physicians, staff members, medical students, and industry personnel – has published position papers in two important areas of how ophthalmology might make further steps towards sustainability.

"What if we stop to think about the logic of regulations that are currently stifling sustainability?"

The first of these papers – "Reducing topical drug waste in ophthalmic surgery" – highlights how many surgical facilities in the US, particularly those in larger hospitals, require that a bottle of eye drops must be used only for one patient before being discarded. The authors state that this practice "significantly increases the cost and carbon footprint of ophthalmic surgery and the risk for periodic drug shortages," before going on to note that no regulation actually requires this practice, and that bottles of partially used eye drops can instead be reused on different patients until they are empty or they expire, all without compromising patient care.

Another ophthalmic sustainability issue – the paper instructions for use (IFUs) – is addressed in Emily Schehlein's 2024 paper. Schehlein suggests that paper IFUs could be replaced with QR codes printed on the outside of surgical packaging. This small change would allow the most recent information to be available instantly and in multiple languages anywhere in the world.

Currently, there are very few global facilities performing surgery that do not have internet access – at least on a mobile phone. But for those facilities where internet access is either unreliable or non-existent, a paper copy of IFU could easily be provided once or twice a year. Schehlein recommends that facilities also print a paper copy from a downloadable PDF to be used as backup in instances when internet access is limited.

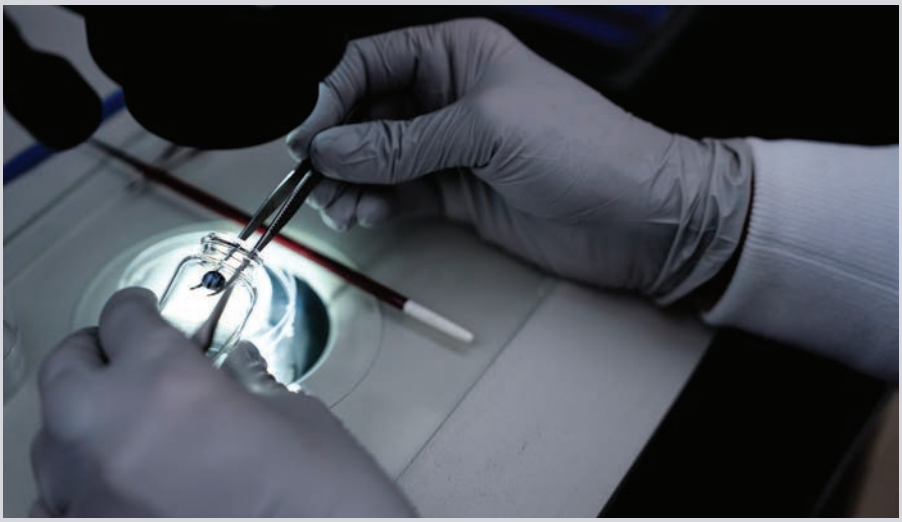
The EyeSustain Pledge is a simple commitment that any surgical facility can make toward sustainability. It involves educating your staff about sustainability, evaluating surgical packs for rarely used products (in other words, items that can be separately opened only when they are needed), using bottles of eye drops for multiple patients when possible, assessing the need for full body draping, and frequently evaluating the options of reusable versus disposable instruments and products.

It will take years of ongoing work to change some of the long-standing, wasteful practices that are unfortunately so common in ophthalmology. Meanwhile, I believe that everyone in the profession can take an interest in this area at a grassroots level, making small incremental changes towards the greater good. I think that Anne-Marie Bonneau – best known as the "Zero-Waste Chef" – put it most eloquently when she said, "We don't need a handful of people doing zero waste perfectly. We need millions of people doing it imperfectly."

By overcoming the fear of regulatory pushback and the need to perform "perfectly" every single time, each one of us can work towards a more sustainable future. This would be a future that is not only realistic and achievable, but also benefits those generations of ophthalmologists to come.

How Biomarker Detection is Personalizing Treatment Decisions in Diabetic Macular Edema

Enabling early intervention with technological advances, healthcare professionals can improve outcomes for people with DME



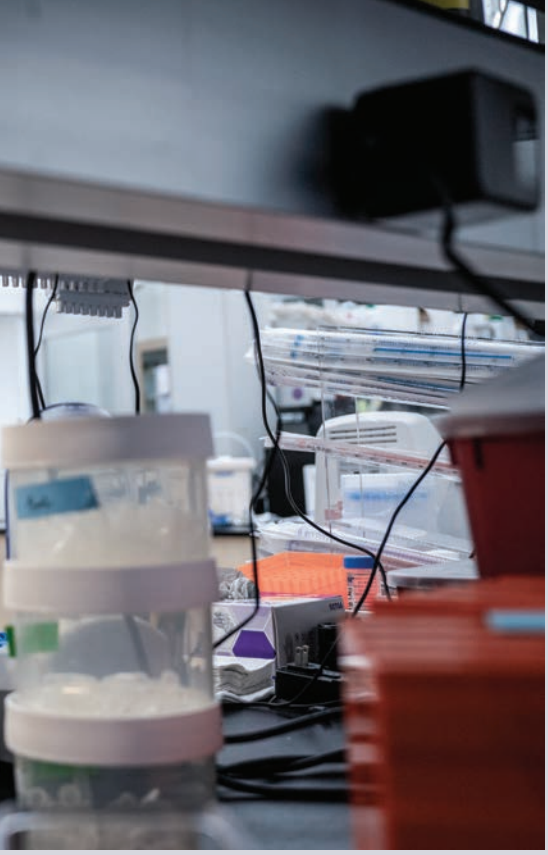
Managing diabetic macular edema (DME), the main cause of vision loss in people living with diabetes, is a complex challenge due to late detection and treatment response variability (1, 2). With deepening understanding of ocular biomarkers and advances in artificial intelligence (AI), healthcare professionals are gaining the tools to swiftly identify DME and deliver timely interventions to help improve patient care (3, 4).

DME is characterized by inflammation, retinal thickening, and macular swelling (2). Some studies suggest that almost one in three people with diabetes are affected by DME (5). When improperly managed or left untreated, progressive retinal damage from DME may severely impair vision (6). "If patients do not respond to treatment, they lose visual acuity," adds Dr. Mathias Schifflers, International Medical Affairs Head of Eye Care at AbbVie.

How can we use biomarkers to predict how patients will respond to treatment?

Inflammation has a key role in the pathophysiology of DME, driven by several biochemical processes triggered through hyperglycemia (7), says Schifflers. "Unlike other retinal diseases such as neovascular age-related macular degeneration, we see the expression of multiple inflammatory cytokines, broadening possible treatment targets. There are multiple pathways that could be driving the edema; for example, if there is a greater inflammatory component, the edema may be less likely to resolve quickly with anti-vascular endothelial growth factor (VEGF) agents. The presence of various inflammatory cytokines is associated with different DME phenotypes and can be used to help determine prognosis and response to treatment."

Imaging innovations have changed the landscape of DME through increasingly advanced ocular biomarker detection (8). Dr. Jie Shen, Vice President of Translational Sciences at AbbVie, explains: "Right now, we use optical coherence tomography (OCT) to look at structural features of the disease: at which layer of the retina is the edema? How thick is it – how much fluid has accumulated, especially around the macula?" Shen has decades of experience



"As understanding of ocular biomarkers increases and AI devices are validated, treatment decisions will continue to become more personalized, elevating the standard of care."

in ophthalmology and says these retinal thickness measurements can be used to detect severity and location of the edema. Monitoring for changes in these factors is one aspect of measuring DME treatment efficacy (9).

Research shows that certain OCT biomarkers indicate how an eye with DME may respond to different treatment classes, allowing personalized decision-making in patient care (10). "Many groups, including leading retinal experts, have published on the role of OCT biomarkers in predicting response to treatment with intravitreal therapies," Schifflers observes. "We are conducting studies to understand which patients potentially respond well to specific treatments by analyzing optical biomarkers." OCT biomarkers such as hyper-reflective foci, outer retinal layer disruption, and intraretinal cysts may help to predict treatment response (10).

How is research and clinical practice evolving now that we better understand the pathophysiology of DME?

"This is where AI comes in," says Shen. "Even with the most advanced OCT machine, it's not necessarily at a point that you can delineate exactly which retinal cell layer has edema and readily quantify the edema volume."

Schifflers adds, "AbbVie is working at the forefront of what science can provide by partnering with AI technology and academic researchers to investigate treatment responses. This will help us to guide treatment using OCT to identify predictive features, really changing the standard of care."

"AI could predict disease progression based on an individual retina's structural features, even maybe getting to a point at which it can determine what kind of therapy a person would be most responsive to," says Shen.

By utilizing technological advances in clinical practice to enable early intervention, healthcare professionals can improve outcomes for people with DME (3). Schifflers adds: "Some key groups have recognized the value of using biomarkers to tailor treatment to patient phenotype, helping ensure patients are initiated on the treatment most likely to provide an optimal response. As understanding of ocular biomarkers increases and AI devices are validated, treatment decisions will continue to become more personalized, elevating the standard of care."

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The Art of Eyes 2024

Showcasing a selection of art from across the spectrum of ophthalmology

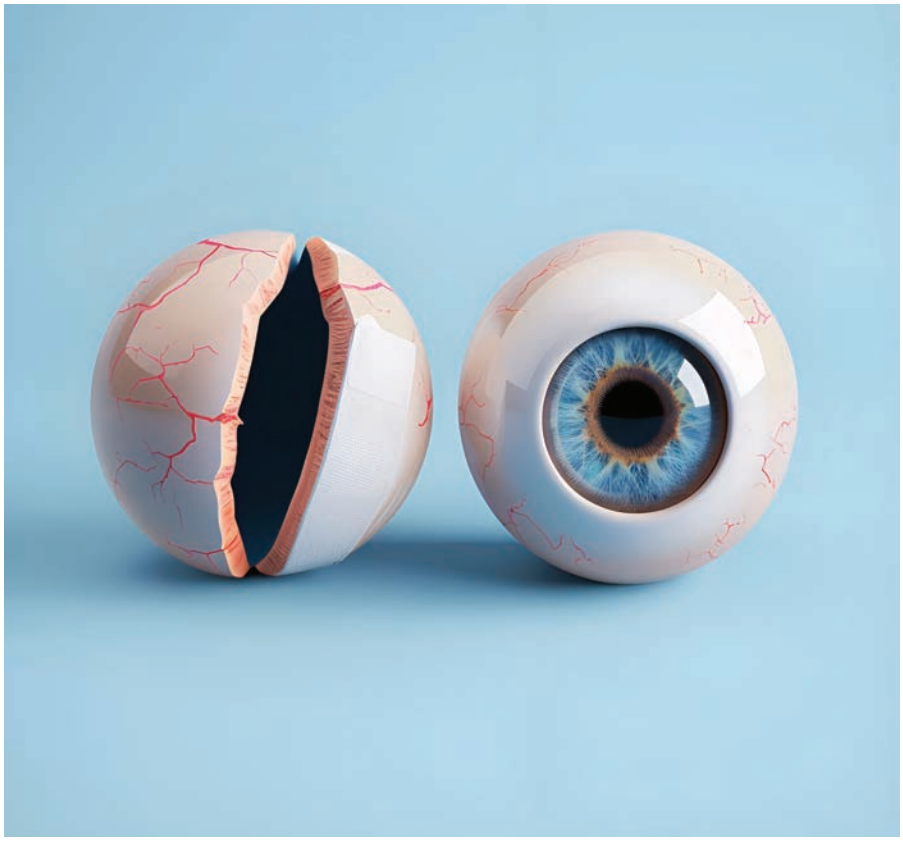
This year marks the 10-year anniversary of The Ophthalmologist's Art of Eyes feature. Once again we are proud to present the finest images, illustrations, and paintings produced by practitioners working in the field.

INTANGIBLE *to* TANGIBLE

Nima Ghadiri is a consultant ophthalmic physician. "This holistic, integrative speciality exists at the interface between the eye and systemic medicine," he says.

Ghadiri recently co-hosted the Uveitis North-West training day ,"A Palette of Possibilities," at the Whitworth Art Gallery in Manchester, UK. He believes that art can be invaluable in giving form to the subjective experiences of patients, transforming the intangible into tangible visual representations. In ocular inflammation (which can be invisible to the naked eye), art can capture the complexities of the condition, and even create a visual narrative.

Title: Reflections on the Eye



EYES *of* CONFLICT

Fares Antaki was born and raised in Aleppo, Syria. Currently a vitreoretinal surgery fellow at the Cleveland Clinic Cole Eye Institute, he has had a long-standing passion for art and technology. The rise of generative artificial intelligence models has enabled him to combine these interests, easing the technical skills required for art creation.

Of this image, he says: "The rise of worldwide armed conflicts has brought immense suffering. For survivors, the aftermath can involve life-altering wounds – including ocular injuries. Losing vision means more than just the loss of sight; it often signifies the loss of livelihood for entire families, perpetuating a cycle of misery."

www.faresantaki.com

The TEAL INVASION

Rushmia Karim completed her medical degree at the University of New South Wales, Australia, and earned a Masters' degrees in Ophthalmology and Clinical Epidemiology from the University of Sydney. She also holds a Genomics degree from Imperial College London. She later trained in the London ophthalmology vocational program, including Moorfields Eye Hospital, where she completed a fellowship in Strabismus and Paediatric Ophthalmology and has subspecialty training in neuro-ophthalmology.

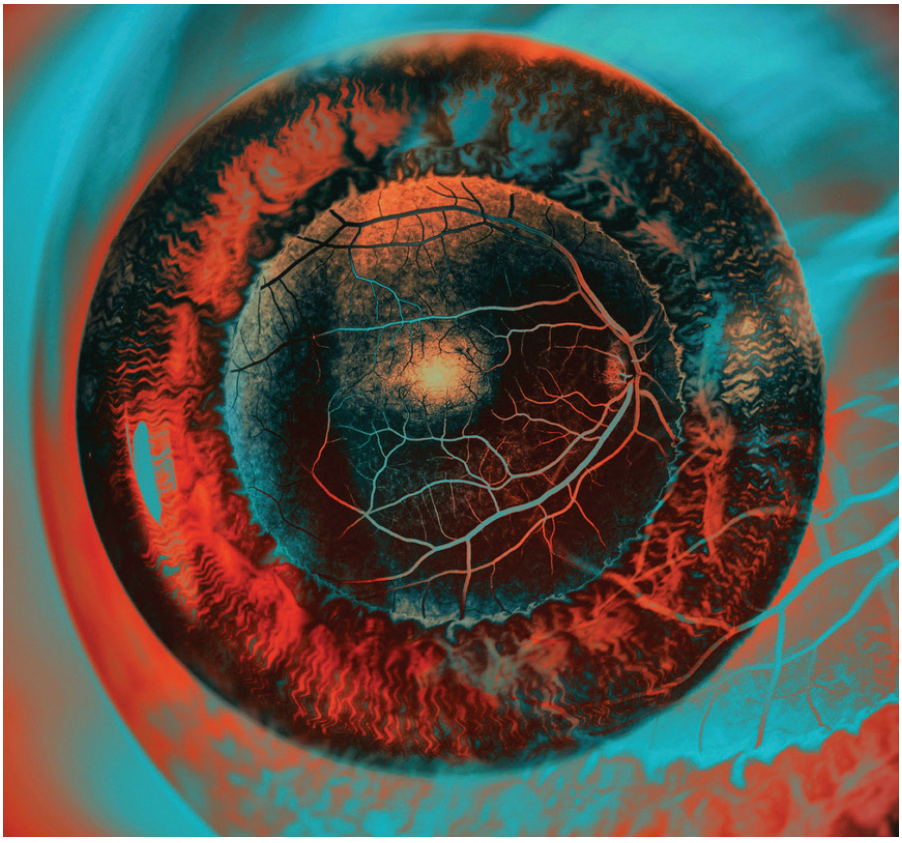
She is a Fellow of the Royal Australian and New Zealand College of Ophthalmologists and the Royal College of Ophthalmologists, UK, and is affiliated with the Save Sight Institute at the University of Sydney.

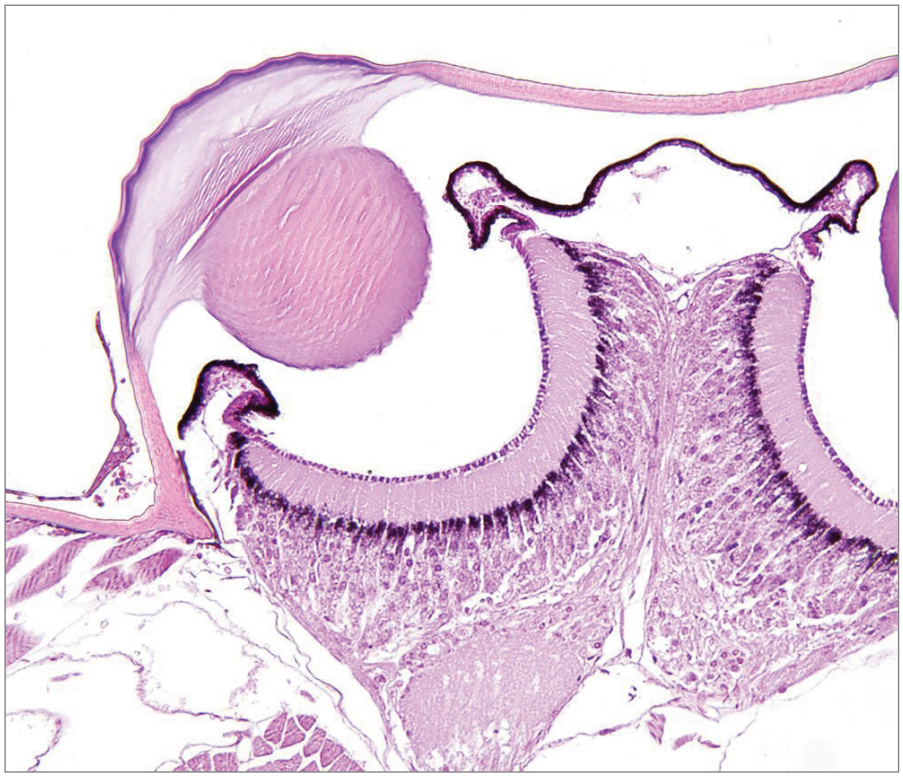
"During the Australian federal election I painted the political landscape that would end up shaping Australia."

PATTERNS *of the* IRIS

Monika Majchrowicz has been practicing ophthalmology for over 20 years in Bielsko-Biała, Poland. In her view, "the iris is one of the most fascinating and beautiful tissues in the human body. Each iris has unique and intricate patterns – not even identical twins have iris patterns that are the same."

Majchrowicz occasionally isolates the iris from its surroundings in her photography, presenting it in a simple, minimalist style. At other times, she combines iris photos with those taken by a fundus camera for a less realistic effect. These close-up photos reveal details such as color gradients, textures, patterns, and even tiny blood vessels, making the eyes appear like alien landscapes.





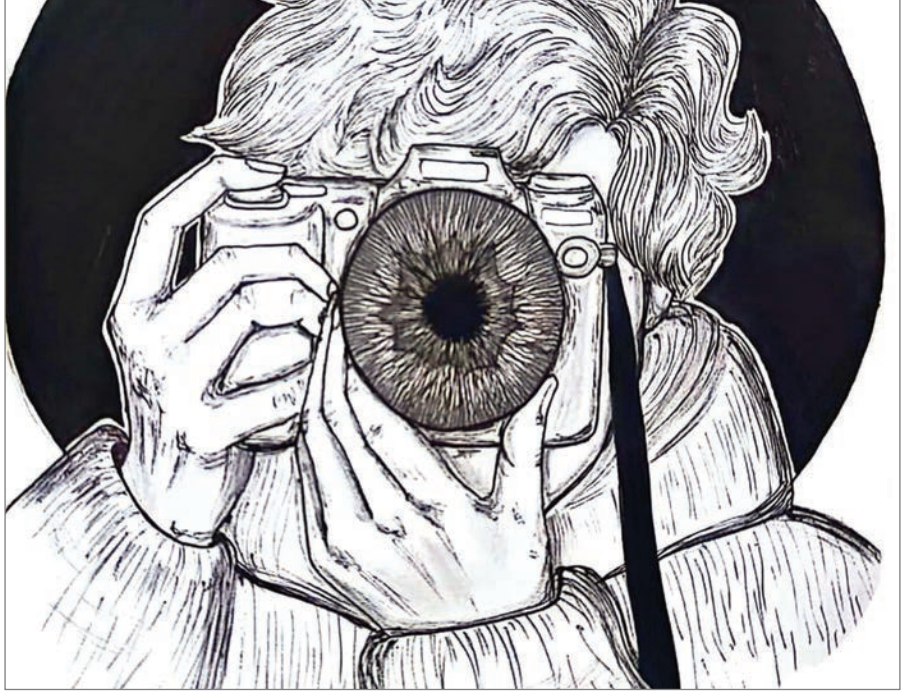
The COMPARATIVE OCULAR PATHOLOGY LABORATORY *of* WISCONSIN

The Comparative Ocular Pathology Laboratory of Wisconsin (COPLOW) was founded in 1983 when Dick Dubielzig was hired to provide pathology services at the University of Wisconsin Veterinary School. COPLOW provides diagnostic services for veterinary ophthalmologists, educational services, and clinical research of ocular pathology and anatomy.

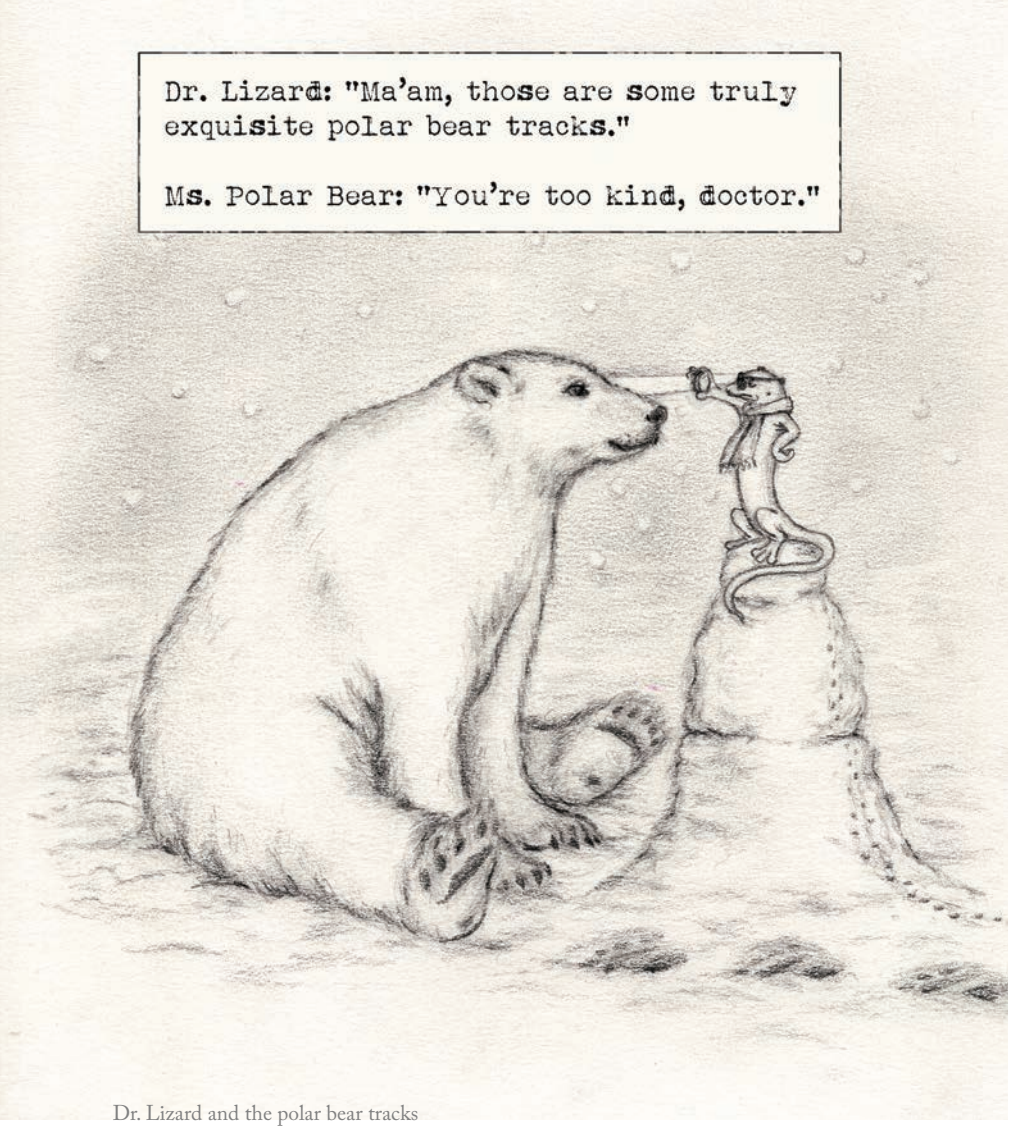
www.vetmed.wisc.edu/lab/coplow/

DEEP *into the* EYE

Mirna Ehab is an Egyptian doctor, self-taught artist, and medical illustrator, who has a strong belief in the ability of art to express ideas, teach, and learn.



The eye, the inspiration for modern day cameras.



Dr. Lizard and the polar bear tracks

The RETURN *of* DR. LIZARD

Dorothea Laurence is a second-year resident at the university clinic in Göttingen, Germany (Universitätsmedizin Göttingen). Between graduating from medical school and her current residency, she spent a few years in the US with her husband and daughters. That's where her love for English-speaking cartoon animals and mixed-media illustrations was born. Her favorite tools are dip-pens and ink, pencils and watercolors.

During the first year of her residency, the pun-leaning terminology in ophthalmology inspired her to create the enigmatic character "Dr. Lizard," who was featured in the summer art issue of The Ophthalmologist in 2021. Since Dr. Lizard's first appearance, his impeccable diagnoses have become a regular contribution in the magazine of one of the two main German ophthalmology associations, "Der Augenarzt" (BVA, Berufsverband der Augenärzte Deutschlands)."

www.dorothealaurence.com.
www.instagram.com/dorotheaslaurence/?hl=en

EYE *on* UKRAINE

Ariana Allen is a Ukrainian-American ophthalmology resident at Duke University, where she also completed her medical school training. Allen's piece, Eye on Ukraine, was first featured at the Ukrainian Art Festival in Durham, NC in 2023. As the war in Ukraine continues, Allen hopes this painting will not only highlight the beauty of sight, but also encourage individuals not to be blind to world issues that may seem distant but have far-reaching consequences.

www.vetmed.wisc.edu/lab/coplow/

"Eye on Ukraine" is a acrylic on canvas painting depicting an eye with a vivid iris of blue and yellow set within a multicolored eyelid that stands out against a stark black background.

EYE SEE STARS

Antonio Yaghy is an intern at UMass Memorial Medical Center in Worcester, MA, USA. In addition to his passion for ophthalmic research, he enjoys creating digital art, playing music, and writing poetry. His artistic works have been selected for publication in medical journals including the AMA Journal of Ethics, JAMA Oncology, the Canadian Medical Education Journal, and Palliative & Supportive Care.

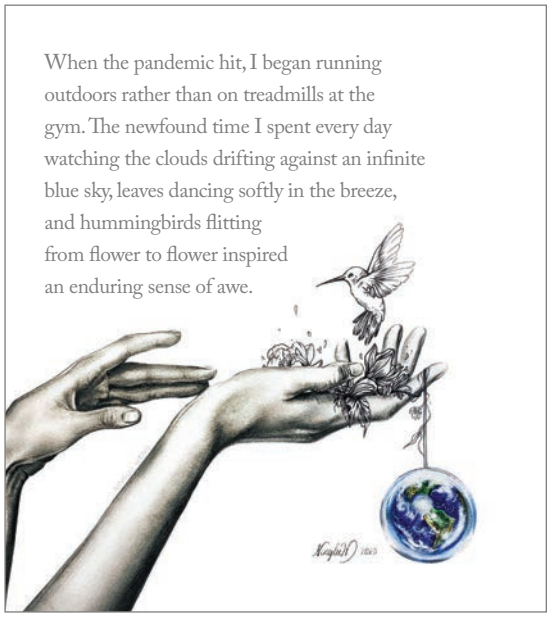
Highlighting the profound connection between our eyes and the universe, reminding us of the wonders that sight allows us to perceive.

FLOURISHING FURNITURE ART

Reem Osama is a lecturer of ophthalmology at Ain Shams University in Cairo and a Fellow of the Royal College of Surgeons of Glasgow. As a practicing vitreoretinal surgeon, Osama combines medical expertise with a deep passion for art.

Osama comments: "I have had this vision since my teenage years that I would not earn money from my practice in medicine but always from my art… I make hand-painted furniture pieces. Each of them is unique and has a strong inspirational story."

https://www.facebook.com/reemosamaart



VISUAL PERCEPTION

Ninglu Weng is a medical student from Canada with a keen interest in both ophthalmology and the visual arts.

https://www.ningluweng.com/

FOUR FACES

Luigi Marino has been an eye surgeon since 1983. He is currently President of IDEA International Dry Eye Academy, Director of European Dry Eye Institute, member of American Academy of Ophthalmology (AAO) and European Society of Cataract & Refractive Surgeons (ESCRS).

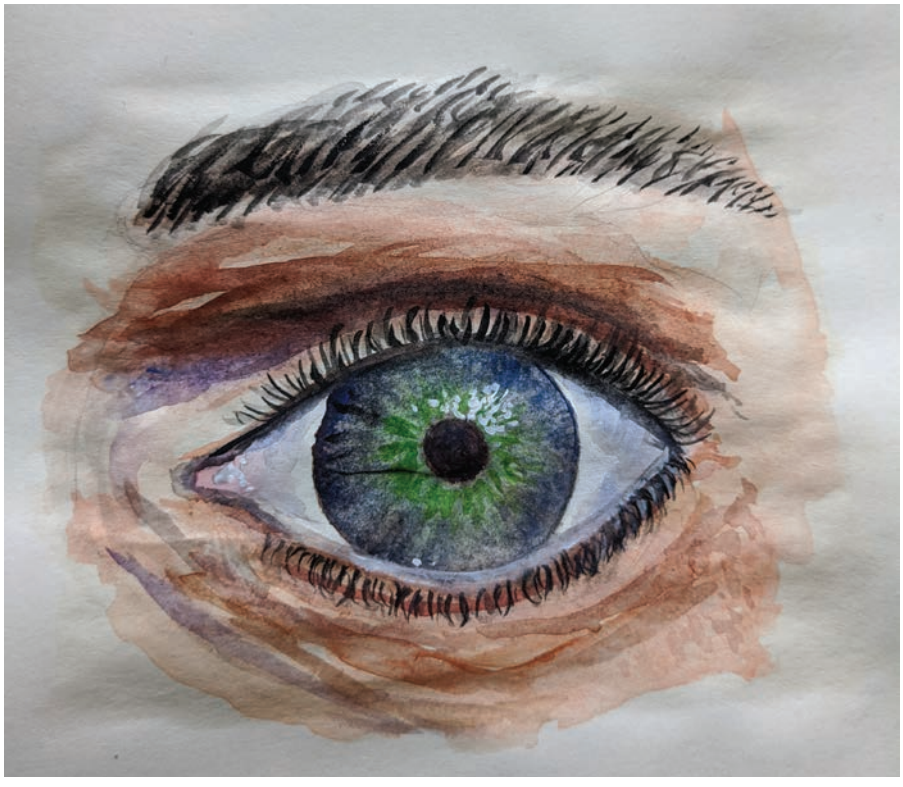
https://www.instagram.com/profluigimarino/?hl=en

The COLORS *of* RETINAL PATHOLOGY

Feyene Art is the pseudonym of an optometrist who began painting and drawing before starting optometry school. Reflecting on this period, they said "I started making art to closely study fundus photography and capture retinal pathology colors and shapes I might otherwise miss. Posting the paintings on Instagram received positive feedback from other ophthalmologists and optometrists, encouraging me to sell them and their prints to help pay off student loans. Fundus photos looked surreal to me initially, and I believe anyone unfamiliar with them would see them as abstract paintings."

www.instagram.com/feyeneart/

Chorioretinitis sclopetaria

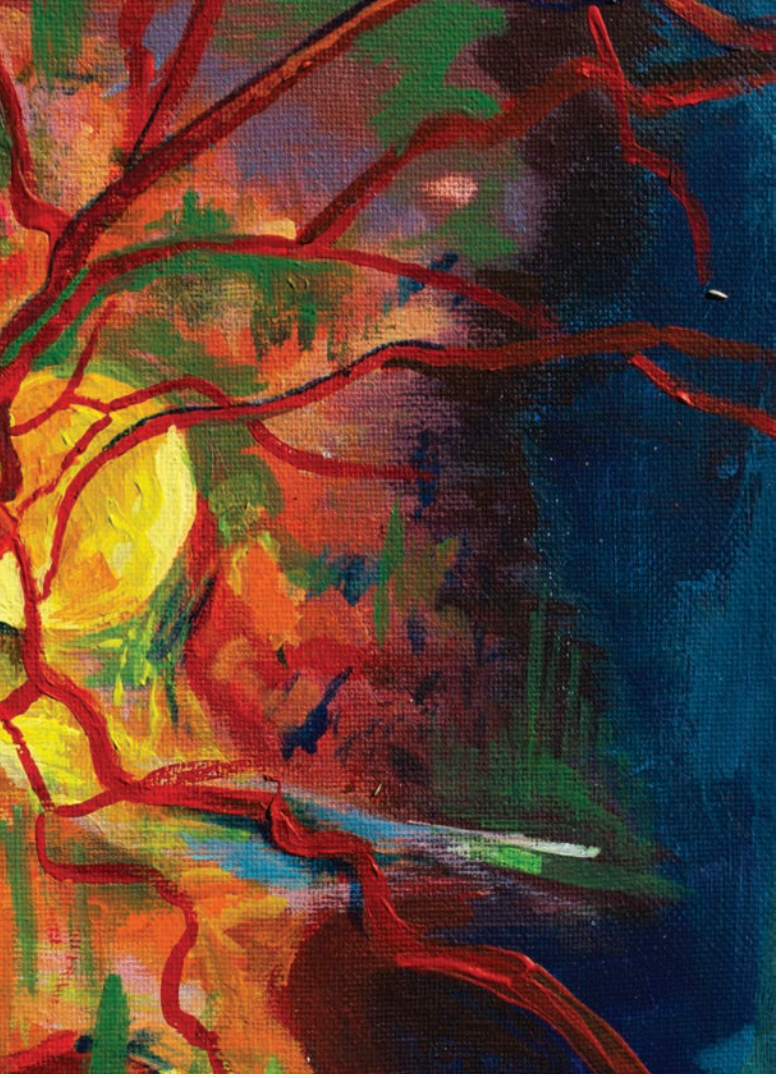


PROGRESS OVER PERFECTION

Tanya Trinh is a triple fellowship qualified Australian ophthalmologist with extensive expertise in the areas of refractive, cornea, cataract and pterygium surgery. She is a staff specialist at the Sydney Eye Hospital, Principal Surgeon at Mosman Eye Centre and is also the co-director of Australia's Keratoprosthesis Program. She currently trains fellows, registrars, and residents in the public and private system in Sydney, Australia.

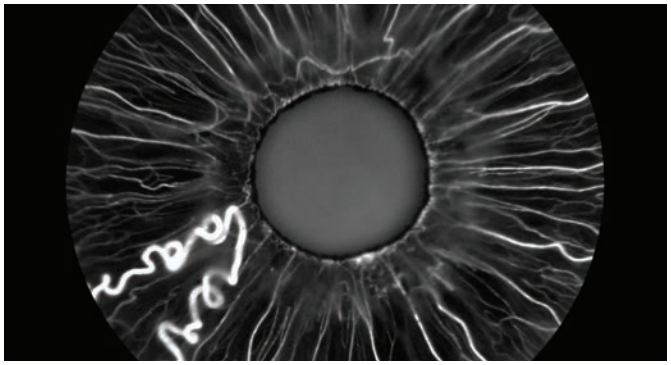
https://www.instagram.com/drtanyatrinh/

The constant evolution of watercolors remind me of the importance of enjoying the journey and not solely focusing on the destination.



ANOMALOUS IRIS VESSEL

Michael P. Kelly, FOPS is Director of Remote Diagnostic Imaging at Duke University Eye Center in Durham, North Carolina. He is a Fellow – and the immediate past president – of the Ophthalmic Photographers' Society. He has written fifty peer-reviewed publications and five book chapters, and has given over one hundred lectures. His image is an anterior segment fluorescein angiogram of a patient referred for the presence of a suspicious vessel coursing over the iris.



ANTERIOR SEGMENT

Pushing Back on BAK

Miriam Kolko explains how she and her research group EyeTRU helped to change the law in Denmark on generic eye drop ingredients

Why did you bring the issue of generics and benzalkonium chloride (BAK) in eye drops to public attention in Denmark?

Around 10 years ago, my patients were asking me about generics. They would show me different bottles of latanoprost and ask, "Are these all the same?" And I had to reply, " I don't actually know." They were supposed to be the same treatment, but the bottle designs were different, the boxes were different. Together with a colleague, I began to purchase all the different generics of latanoprost and measured their physical and chemical properties. And we found significant differences in all of them, not so much with the active component, but with the inactive components. With topical medications such as eye drops, one of the inactive components is preservatives, in particular benzalkonium chloride (BAK).

Our following studies showed that there was a difference between BAK-containing generics and brand-name latanoprost in terms of the effect on human conjunctival goblet cell survival. The generic variant with BAK was very toxic, but the original brand name drops – with polyquad preservative – were much less toxic.

We found that in Denmark there are very few regulations to follow when you introduce a generic, certainly compared with all the phases you need to go through with a new branded medicine. As a result of our collaboration with Fight for Sight Denmark and the Danish Glaucoma Society, we instigated a change in the law. Now in Denmark, it is no longer legal to substitute BAK into a generic variant where the original brand name does not have it.

"I think it's our duty to do what we think is the best for patients."

What do patients need to know about BAK?

There are other negative ingredients, but BAK is the "bad guy." It's one of the more toxic preservatives, and the one most commonly used in eye drops. We're working to make patients aware of the existence of BAK in their eye drops and asking the question, "Why would you put a toxin into an eye drop for chronic use?" It's not about efficacy; it's been shown that there is no efficacy difference between BAK-free and BAK-containing eye drops.

In my opinion, the only case where BAK could perhaps be useful is in short-term antibiotics treatments as it kills bacteria. But generally, the more BAK comes into contact with the eye, the more toxic it becomes to the ocular surface. And the more side effects the patients suffer, the less adherent they become.

If patients are getting side effects from a generic, they should communicate this to their physician or eye doctor because it might not be the most appropriate treatment for them. Physicians should also be aware that if we use more eye drops, it's better to use a combination where only one contains BAK, as opposed to all three. The less BAK, the better!

Do you have a taste for activism now?

I think it's our duty to do what we think is the best for patients. We should engage them because, in the end, it's patients that actually have the power. But they need to understand what opportunities they have, understand their disease and their choices, and know what is harmful. When something does not make sense or is causing harm, we should speak up, talk to the authorities, join forces with patient organizations and societies, and approach politicians because it is possible to actually make a difference.

We still need to do more research to convince the authorities to phase out BAK and work towards optimizing the requirements for generics much more than we do. I'm not against generics, of course, but it's important that we are certain that generics are as efficient – and have no more side effects – than the original medication.

Miriam Kolko is senior consultant and glaucoma specialist at the Copenhagen University Hospital and Professor in Translational Eye Research at the Department of Drug Design and Pharmacology at the University of Copenhagen, Denmark.

ANTERIOR SEGMENT

Femto for Limbal Stem Cell Transplants

Introducing an innovative application for a tried and tested refractive and cataract surgery laser

Boris Malyugin, Professor of Ophthalmology and Deputy Director General, S. Fyodorov Eye Microsurgery State Institution in Moscow, has been heavily involved in a project that seeks to enhance safety and reproducibility of limbal stem cell transplants through the application of a femtosecond laser more typically used for refractive, cataract and therapeutic surgery. Here, we dig into the condition and the collaboration to improve treatment.

What are the main challenges in addressing limbal stem cell deficiency?

When I started treating patients with limbal stem cell deficiency (LSCD), I realized how challenging it would be just to establish a correct diagnosis and distinguish it from many other ocular conditions involving corneal neovascularization. Clearly, you need the correct diagnosis to build the proper treatment strategy. Luckily, we now have several tools to help us – in addition to studies of the pattern of corneal staining with low molecular weight fluorescein. For example, sophisticated analysis of specific keratins expressed by corneal and conjunctival epithelium has been done with the help of immunohistochemistry. High resolution optical coherence tomography (OCT) with epithelial mapping and angiography, as well as corneal confocal microscopy, have also proved very helpful. Unfortunately, only big treatment centers can afford to invest into these expensive and time-consuming technologies and employ those people who are knowledgeable enough in ocular surface disorders.

Another challenge has been finding the best treatment strategy for each specific patient. In some cases, we need multi-stage treatment, especially with chemical burns and trauma, when collaborative work with an oculoplastic team might be necessary. And then there is the surgical procedure itself. And that's where femtosecond lasers could play a more major role thanks to their intrinsic characteristic: high precision, minimal collateral damage, short learning curve, and the elimination of human errors. All of these factors yield better outcomes.

How exactly can femtosecond lasers help treat LSCD?

In 2018, we developed a procedure called glueless simple limbal epithelial transplantation (GSLET). In 2020, the technique was published in the journal Cornea, and four years later we presented the mid-term results (1,2). In GSLET, we create eight partial-thickness corneal tunnels located in the periphery of the affected cornea and put in limbal fragments harvested from the subject's healthy, unaffected eye. In this way, we create specific limbal stem cell (LSC) reservoirs rather than place them on the surface of the cornea as happens with the other techniques. These LSC niches serve as bioreactors that generate new epithelial cells that repopulate the corneal surface and restore its normal anatomy.

For us, the next logical step was to use a femtosecond laser to create the corneal tunnels. These tunnels have a specific configuration to allow limbal fragments to be fixated inside them without use of additional sutures, thus decreasing the collateral damage. This technology is called femtosecond laser-assisted GSLET or FS-GSLET and it has proved very successful. Our study results are currently under review for publication by one of the major journals in the field.

The latest innovation is in using the same laser – namely, Ziemer's FEMTO LDV Z8 – to harvest the LSCs. This process, when performed manually, requires advanced skills and is not very intuitive. Again, the laser helps us conduct this procedure in a more controlled and precise manner, which enhances the surgical outcome.

Personally, I believe that, with this laser, an average surgeon can become a very good one, and a very good surgeon can become perfect. And maybe the average one will also become perfect at some point!

Why the Ziemer Z8?

Well, I have partnered with various companies, big, small, and medium-sized. And I can say that, though the big players are very powerful and good at what they do, the internal decision-making process usually is slow and sometimes very complicated... My experience with Ziemer has been the opposite. The company does its best to stay close to the surgeon, lowering the barriers and listening carefully to the clinical needs. The feedback to requests is almost immediate, and that is a great driver for innovation!

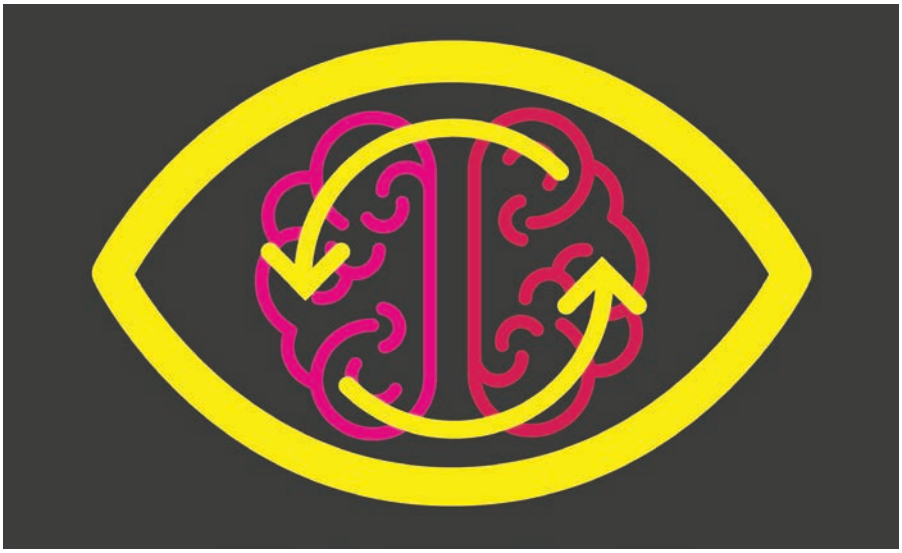
See references online at: top.txp.to/femto/limbal/cell/transplantation

GLAUCOMA

Neuroprotection: The Future of Glaucoma Treatment?

Assessing the power of neurorepair, early detection, and combination therapy in glaucoma management

By Ghazi O. Bou Ghanem, MD, and David J. Calkins, PhD, Vanderbilt Eye Institute, Department of Ophthalmology and Visual Sciences, Vanderbilt University Medical Center, Nashville, TN, USA.



Current glaucoma treatments focus on lowering intraocular pressure (IOP), which is akin to fighting a raging fire with a bucket of water – the intervention slows the inferno, but it cannot extinguish it. For many patients, there simply are not enough "buckets." And, like many other researchers, we share the realization that more must be done.

The truth is this: our single-minded pursuit of managing IOP is failing a significant portion of patients. Glaucoma progressed in 20 percent of participants in a UK-based glaucoma treatment study (UKGTS) by 24 months (1), and an earlier study revealed that 46 percent of patients receiving IOP-lowering surgery progressed to blindness within a decade even when IOP was "controlled" (2). Patients need a paradigm shift – a multi-pronged strategy that not only targets IOP management but also actively supports, protects, and even repairs RGCs and the optic nerve.

We want to create glaucoma treatments that do more than lower pressure; we want to empower RGCs to fight back. This goal demands a greater understanding of the relationship between the mechanical stress, vascular and metabolic dysfunction, and inflammatory cascades that contribute to glaucomatous damage to the optic projection. Think of it as equipping the system and its constitutive elements (RGCs, axons, glia, vessels, extracellular matrix, and so on) with a comprehensive toolkit to manage oxidative stress, optimize energy production, and mitigate inflammation. The good news is that neurons are inherently resilient fighters, with adaptive responses in their arsenal (3). It is important to note though that these responses are limited by resource constraints and require external support for long-term survival and recovery.

One field that could have a positive impact in this regard is neuroprotection or neurorepair. This approach has the capability to combine diverse strategies, each targeting a specific aspect of the disease during a specific point in progression, to create a personalized treatment regimen for each patient or for each type of glaucoma. But it hinges on early detection. The sooner we intervene, before irreversible damage sets in, the greater the chance of success. New biomarkers – molecular, electrophysiological, and imaging – are of particular interest, as they offer earlier and more accurate detection. Other testing methods, like clustered testing, are an additional way we can quickly identify eyes with rapidly progressing glaucoma; thus, improving the feasibility of glaucoma clinical trials (4).

The road to a combination neuroprotective future is not without its bumps, however. Combination therapy trials are notoriously difficult and expensive. They will require adaptive trial designs that adjust based on interim data analysis, as well as robust collaborations between researchers, industry, and regulatory bodies. The validity of preclinical models is also crucial. No single model can perfectly capture the intricate complexities of glaucoma. Therefore, evaluating treatment regimens in a battery of diverse experimental models, including non-human primates with their close resemblance to human ocular anatomy, is paramount. Only through this multifaceted approach can we establish robust evidence for the effectiveness of combination therapies, setting a foundation for evaluation in clinical trials (5).

The future of glaucoma treatment is not about a single magic bullet but rather a well-equipped and diverse arsenal. Through the power of neuroprotection, early detection, and combination therapy, we can rewrite the narrative against this condition – one that moves beyond the limitations of IOP-centric approaches.

See references online at: top.txp.to/Neuroprotection/Future/Glaucoma/Treatment

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RETINA

Surgical Tips for Retina – Part 2

In the second of this two-part series, Ferenc Kuhn and Andrzej Grzybowski discuss what the ophthalmologist needs to address during eye surgery

Retinal surgery has gradually become vitreoretinal (VR) surgery; it's extremely rare today that a posterior segment surgeon performs scleral buckling only. This two-part series, therefore, discusses a handful of highly selected surgical tips related to vitreoretinal procedures. In Part 1, we covered the preparation needed before surgery begins.

No procedure, especially VR surgery, should be performed without the surgeon first designing a plan. The plan is akin to a map – how to get from place A to place B. The surgeon should have a rough idea of the eye's condition prior to surgery, and the anatomy to arrive at as the surgery is completed. This strategy mostly concerns preparing for what is in the "road" that connects the two endpoints. Naturally, the plan is always modified based on how the actual surgery evolves and how tissues react to the surgeon's manipulations.

Here, we review several tips that are useful during surgery.

1. Placement of the (intrascleral) cannulas

The role of the three cannulas is mainly to provide access to the vitreous cavity for the infusion line and for the instruments to be used. The trocar at the time of scleral penetration should have a ~15-degree angle to the surface; its distance from the limbus in an emmetropic eye is 3–3.5 mm, and they are ideally positioned in the right eye at 7 o'clock (infusion line; 5 o'clock in the left) and at 2:30 and 9:30 for the "working" cannulas. A fourth cannula is inserted, typically superiorly, if truly bimanual vitrectomy is performed.

2. Anterior segment: the lens

When the strategy has been formulated, the surgeon must take into consideration that every VR surgery leads to cataract development (not only "if the patient is over 50 years old," as the literature used to claim). In other words, cataract development is not a complication but a side effect of vitrectomy. In patients compromised by age, concomitant cataract surgery should be offered, especially if silicone oil is to be used. The old counter-argument that cataract surgery increases the severity of the postoperative inflammation is no longer valid with today's phacoemulsification technology.

3. The vitreous: the sequence and completeness of the removal

If there is no severe vitreoretinal traction, and especially if the vitreous is transparent (for example, no vitreous hemorrhage is present), a posterior-anterior approach is recommended. The vitreous removal is started centrally and posteriorly, and is gradually extended towards the mid-vitreous cavity and then towards the periphery and the retrolenticular space. For this latter area, vitreous removal is highly advantageous if there is severe VR traction (proliferative vitreoretinopathy [PVR], proliferative diabetic retinopathy [PDR]) and in eyes with retinal detachment or trauma. In a phakic eye, small air bubbles should be injected behind the lens; if they remain there, vitreous is still present behind the lens. This is first detached by gentle

aspiration and then removed by holding the vitrectomy probe's port sideways, minimizing the risk of lens touch/cut.

4. Posterior vitreous detachment (PVD)

One of the most misleading concepts in the literature has been the myth of spontaneous PVD developing in conditions such as vitreous hemorrhage, retinal detachment, PVR, PDR, and trauma involving the posterior segment. However, if the surgeon actively tries to verify the presence of vitreous on the posterior retina – and triamcinolone is an almost mandatory vehicle for this – they will discover more often than not that what appears to be PVD is in fact vitreoschisis (a thin layer of vitreous is still undetached from the retinal surface). If this is not detached and removed, a host of complications (from macular pucker to retinal detachment) may arise.

The most common method of surgical PVD-creation involves using high flow/aspiration but no cutting, as the vitrectomy probe is dragged along the disc margin on the temporal side, barely touching or just above the retinal plane. It is triamcinolone that helps the surgeon visualize the vitreous, both when it is still attached and when it finally pops up. Once separation has been achieved, the cutting action is to be activated so that no VR traction is transmitted towards the periphery where separation of the two tissues is impossible.

If aspiration is insufficient to lift the posterior vitreous, a barbed needle/blade can be used to engage the vitreous; this is ideally done under a contact lens to increase the resolution and avoid retinal damage.

"No procedure, especially VR surgery, should be performed without the surgeon first designing a plan. The plan is akin to a map – how to get from place A to place B."

Credit: shutterstock.com

5. Macular pucker

A forceps or a barbed needle/blade can be used to lift the scar tissue from the retinal surface – almost all eyes with a pucker have a true PVD. Care must be taken if there is an area in the scar that seems to be very prominently elevated, especially if it is whitish colored – this may be a retinal fold. The entire membrane should be detached within the vascular arcade, and serious consideration should be given to also remove the internal limiting membrane (ILM). The ILM may already be partially broken, and, more importantly, its removal prevents recurrence of the pucker (otherwise occurring in up to 10 percent of the eyes).

6. Surgery on an injured eye

Surgery on an injured eye is always a challenge because of the many unknowns and the relatively small number of rules related to management. Moreover, this surgery might require different experience or training based on different cases. Below we touch upon two very basic issues of the tissue in the tactics category.

- **Anterior segment: hyphema**
  If liquid, the blood can be removed through a single paracentesis created on the temporal side. The cannula is used both to push down the opening's inferior lip and to irrigate the anterior chamber (AC). If the blood is clotted, an AC maintainer must be positioned first, ideally inferotemporally and with its tip slightly downwards over the iris (to prevent damaging the endothelium and the lens). The vitrectomy probe is used to engage and remove the clot; the port should be kept sideways and always occluded by the clot.
- **Anterior segment: the iris**
  This diaphragm must always be reconstituted if damaged; should posterior segment surgery be required, the reconstruction of the iris is the last step, only when the VR situation is deemed final. If during the initial examination/surgery a wide pupil is found, the iris may be missing (rupture) or simply retracted by fibrin (contusion). In the latter case the iris must urgently be pulled using serrated vitrectomy forceps so that the fibrin "glue" is broken and a normal-sized pupil created.

Moira Chinthambi working at Kabudula Health Centre, Lilongwe, Central Malawi. Copyright: Sightsavers/Thoko Chikondi

PROFESSION

Reaching Out in Malawi

Moira Chinthambi discusses eye care outreach and her involvement with the Sightsavers Inclusive Eye Health program

Moira Chinthambi is an ophthalmologist at Kamuzu Central Hospital, Lilongwe city, Malawi.

Can you talk about the eye health project you were recently involved in?

The eye health project was in partnership with Sightsavers and funded by the UK Government and the British public through the UK Aid Match program. It was a program based around inclusive eye health, and there were a number of services being offered across the rural population. The project was conducted in the South West Health Zone of Malawi, and also in the Lilongwe district. Lilongwe is the capital city of Malawi, but we focused mainly on the rural community.

We did a lot of outreach – providing eye health screenings within the community and reaching over 120,000 people. If we identified any patients with eye diseases, we would give them treatment; for example, if they had cataracts, we would perform these cataract surgeries at the local community eye hospitals. We would send our ambulances out into hard-to-reach areas and pick up those patients who needed to be referred and bring them to the nearest community hospital, where we would be waiting to do the cataract surgeries.

When I joined ophthalmology, many of my family members were disappointed; they wanted me to do the "bigger" things – obstetrics, gynecology, and surgery. Everyone kept saying, "It's just the eye. It's just a tiny little organ." I think many people underestimate the value of good eye care. After all, fixing this "tiny little organ" can significantly impact someone's life.

How did the project promote inclusivity for disabled people and women?

We worked hand in hand with the Federation of Disability Organisations in Malawi (FEDOMA) – with a focus on the training of healthcare staff. Then, during the cataract surgery camps, we were able to prioritize people living with disability. It wasn't solely about training and awareness; it was also about involving those minority groups and making sure they also got access to eye health care – if they needed surgery, they got surgery; if they needed eye drops, they got eye drops.

Why do minority groups have less access to eye care in Malawi?

In terms of women, I think the primary reason is our cultural beliefs or the cultural norms of our society; men tend to be prioritized more than women in almost every aspect of life. If a man and a woman are unwell, it's likely that the man will be made the priority in terms of receiving treatment. This cultural norm also relates to decision-making – most of the families are headed by men, it is the man who makes the decision. I think this is a significant barrier [for women] accessing eye care services.

The infrastructure of our country also presents a major challenge. There can be vast distances between hard-to-reach areas and the nearest health facility. So, although we have a good referral system, most people have to travel over 20 kilometers to their nearest hospital. Unless it is provided through initiatives like the inclusive eye health programme, transport to hospitals is not always available in rural communities.

People living with a disability may need someone to escort them to the hospital; If no one is available, they simply cannot go. Most of these people with disabilities also have financial constraints or may be unable to travel. If these individuals do manage to get to the hospital, many of our health facilities are still not disability friendly.

What are the main eye care issues you encounter in your country?

Firstly, it's geography – some rural areas are remote and difficult to reach; in Malawi, the majority of the population live in rural areas.

Secondly, there is an issue of awareness; most people do not know about all the services that are being offered at the hospital. For example, if someone is born with a visual impairment, people just assume that is "just the way God designed it" and so they're not brought to the hospital.

PROFESSION

Rising Star: Pooja Khamar

Power List Rising Star Pooja Khamar talks about her strong family ties to ophthalmology, her ophthalmic heroes, and the core principles that guide her career

Pooja Khamar is a consultant and lead trainer in cataract and refractive services, and a clinician and a translational scientist at Narayana Nethralaya Eye Institute, Bangalore, India.

For Pooja Khamar, ophthalmology was a calling. Growing up with an uncle, Bakulesh Khamar, who was a renowned retina specialist and an aunt, Mayuri Khamar, who was a glaucoma specialist, she not only gained an early introduction to the eye care world but also to the area of translational research. She watched her uncle achieve what was in the 1980s the rare dream of becoming a clinician-researcher in translational sciences, pursuing translational research in his extra-duty hours. Khamar saw him become one of the first people in India to work on long-term preservation of corneas, granting in remote areas access to corneal transplantation, ocular oncology drug delivery systems, and the development of several vaccines – including COVID-19 vaccinations. This left an indelible mark on Khamar. When it came to embarking on her own career journey, she did so with a similar dream – to make a lasting impact on ophthalmology through a combination of clinical and translational research.

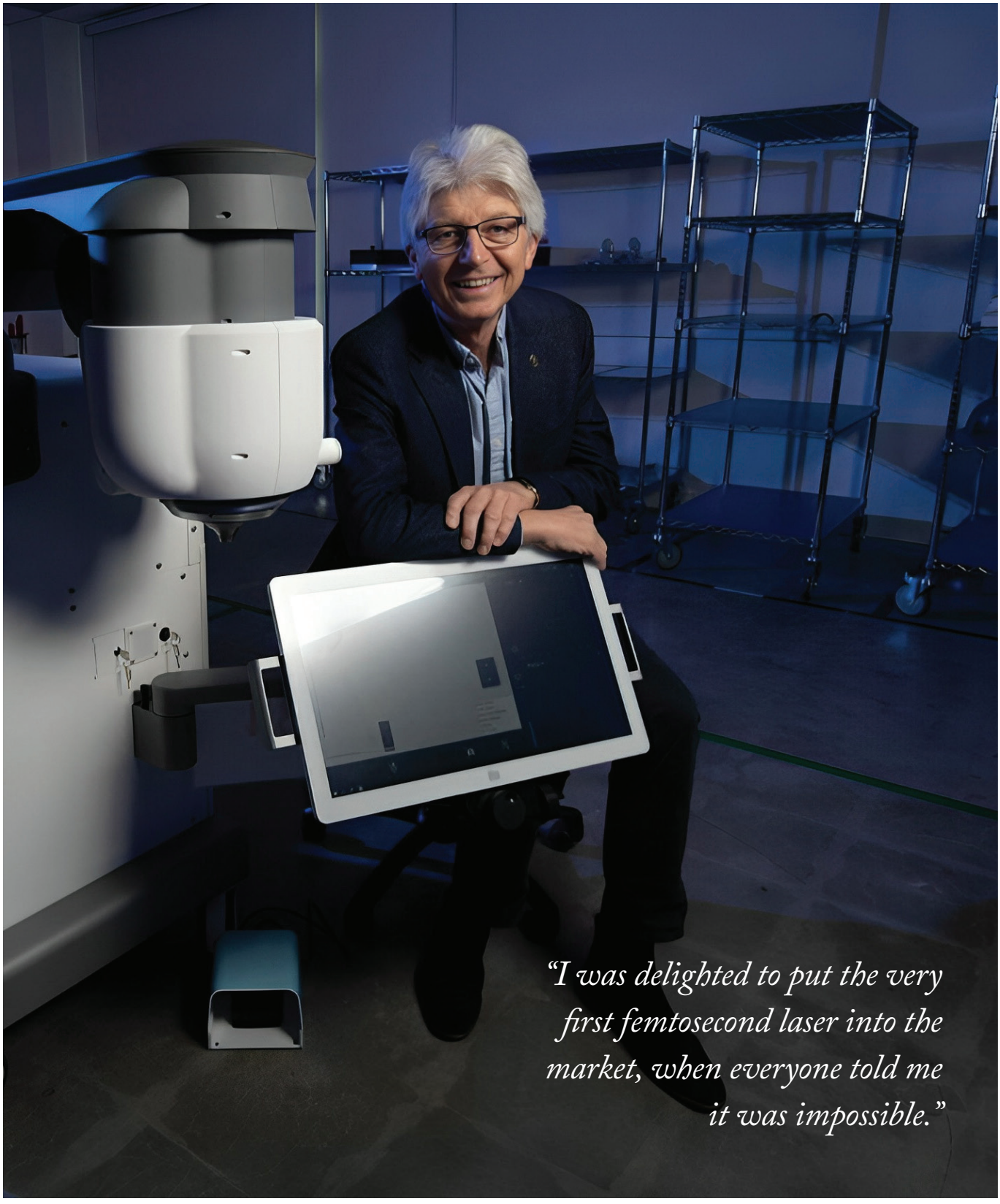
"One of the core foundations on which Pooja Khamar has built her career is the idea of 'singing for your soul'"

Of the core principles that formed the foundation on which Pooja Khamar has built her career, the first is the idea of "singing for your soul" – or, as one of her mentors, Power Lister Rohit Shetty told her, "Enjoy the journey and don't worry about the destination." This philosophy has served as something of a guiding principle, contributing to the joy that Khamar has for the work that she does. Khamar's career has thrived through her fellowship and subsequent work at Narayana Nethralaya Eye Institute, India. Bhujang Shetty, the Institute's late chairman and founder, was the originator of two of Khamar's other guiding principles: make sure the needs and happiness of patients are your paramount concern, and look beyond the patients' conditions to take a holistic medical approach.

To Khamar, this idea of a holistic medicine will form the backbone of ophthalmology's future. To this end, the translational research that she and her team have worked on has included investigating targeted therapies, biomarkers – both imaging and molecular – and genetic testing, as well as artificial intelligence and nanoparticle drug delivery systems. A particular highlight for Khamar is developing the first point-of-care stepwise diagnostic kit. As she explains, "Through this Bio-M Pathfinder Kit, clinicians will measure various molecular biomarkers within a clinical setting with just a Schirmer's strip or an aqueous or vitreous humor, and from this, customize targeted therapies that can be designed for patients with ocular surface conditions, dry eye, diabetic retinopathies, ARMDs, glaucoma, myopia and many other conditions." Khamar's research has not gone unnoticed in the ophthalmology community, with four of the five papers that she presented at the 2019 ASCRS conference in San Diego, California, receiving awards.

Khamar emphasizes that her career "has not been a solo endeavor." She says, "I have received wonderful support from my team and my mentors, who have helped me to keep moving." Shetty, says Khamar, "is among the finest translational scientists and refractive surgeons I have ever encountered. It had been a lifelong dream to receive training under his guidance, and I patiently waited for an opportunity to pursue a fellowship with him." She also points to Power Listers John Marshall, Abhay Vasavada, Damien Gatinel, and Arthur Cummings as having a "profound effect" on her. And she expresses gratitude to her family, particularly her father, Mayur Khamar, "for standing as a steadfast guardian and supporting me in pursuing my dreams, even in the face of numerous challenges he encountered on my behalf."

It's clear that this appreciation flows back to Khamar. As one of her ophthalmic heroes, Damien Gatinel says, "I have had the privilege of knowing Pooja Khamar for nearly a decade. During this time, I have witnessed her remarkable journey from being a skilled clinician to emerging as a pioneering translational scientist. She undoubtedly deserves the recognition she receives, and her remarkable journey is bound to inspire countless young clinicians to embark on similar dynamic roles in the field of medicine."


"I was delighted to put the very first femtosecond laser into the market, when everyone told me it was impossible."

Laser Focus

Sitting Down With…
Tibor Juhasz, femtosecond laser pioneer and CEO of ViaLase

Having obtained a PhD in physics, what drew you to ophthalmology?
It really started by accident. After completing my PhD in Hungary, I was lucky enough to be offered a research position at the University of Rochester, New York, with Gérard Mourou – the world leader in ultrashort pulse laser technology at the time. (Important sidenote: for this work, Mourou and Donna Strickland would go on to be awarded the 2018 Nobel Prize in Physics). After a short time in Rochester, I spent several years in Southern California, doing postdoctoral research and continuing to work in laser technology, including consulting for a company that was evaluating laser applications in ophthalmology. That effort was unsuccessful because we needed much shorter laser pulses to achieve the desired effects.

Eventually I rejoined Mourou in his new lab at the University of Michigan, where he was focusing solely on femtosecond lasers. One day, one of Mourou's graduate students inadvertently lifted his safety goggles and caught a stray laser beam, causing a retinal injury. However, the damage to the retina was extremely small and confined, without any collateral damage. Suddenly, we were all much more excited about ophthalmic applications for femtosecond lasers! Our work together demonstrating the femtosecond laser's capacity to create ocular tissue incisions with micron-level precision without damaging adjacent tissue would ultimately revolutionize laser refractive surgery, cataract surgery, and corneal transplantation.

What were the challenges of bringing femtosecond laser technology to the world's attention?
One problem was that the lasers were very big – filling an entire lab! Plus, you needed at least a couple of graduate students to run around them all day making adjustments to keep them operating. So, the first challenge was to engineer a femtosecond laser that could sit in a small, confined area. The second challenge was to make the laser more stable and less expensive to operate. Although we recognized that there were many potential applications for the femtosecond laser in ophthalmology, we began with flap creation for refractive surgery. At the time, lamellar flaps were made with a microkeratome, but it was difficult to achieve a consistent thickness and the bladed flaps were prone to complications. The femtosecond laser significantly reduced both the uncertainty and the complications, making LASIK safer and more predictable for patients. Bladeless, femtosecond laser LASIK has for years been considered the standard in the field, and more than 24 million patients have benefited from it.

What are you currently focused on in the laser space?
Today, I am focused on glaucoma because I feel there is a real unmet medical need in this area. There are many treatment options for glaucoma patients, but they all have shortcomings of some kind. The femtosecond laser can be used to create drainage channels through the trabecular meshwork. The channels increase the outflow of aqueous humor, thereby decreasing intraocular pressure (IOP) without damage to the adjacent tissues. And, because the femtosecond laser beam can be delivered through the cornea, the procedure can be performed completely non-invasively, without opening the eye. This minimizes or eliminates surgical trauma, speeding up recovery.

How does this process improve on current micro-invasive glaucoma surgery (MIGS)?
MIGS is similar in that it creates an opening in the trabecular meshwork (TM), but in most cases it also involves implantation of a stenting device into the TM. It can be hard to visualize and correctly place the stent and, of course, the patient has undergone corneal incisions to achieve this goal. With an incision-free, precise, femtosecond approach, creating the TM opening can be done noninvasively in a way that is more reproducible and easier to visualize, thereby making it more accessible to a wider range of ophthalmologists and their patients.

How far away are we from seeing femtosecond lasers in glaucoma surgery?
We're now three years out from a pilot study to evaluate the safety and efficacy of the procedure we call FligHT (femtosecond laser, image-guided, high-precision trabeculotomy). In the cohort studied we have seen no serious adverse events and a mean IOP reduction of approximately 34 percent at the two-year timepoint. I think the study indicates that FLigHT is going to be a potentially safe and effective procedure. For example, it creates a single channel – measuring only 500-µm wide by 200-µm high – through the TM and into Schlemm's canal. I can see this working very well as a first-line treatment; it can also be used in patients who are either phakic or pseudophakic who are unhappy or uncontrolled on IOP-lowering medical therapy.

What stands out for you as a particularly proud moment in your career?
As R&D team leader at IntraLase, I was delighted to put the very first femtosecond laser into the market, when everyone told me it was impossible. The safety and efficacy of FLigHT appears to be favorable based on our first-in-human study, so I believe we will defy the odds again by successfully bringing to market the first device capable of performing a noninvasive, non-incisional trabecular bypass procedure in glaucoma.

Read the full version of this interview at top.txp.to/laser/focus

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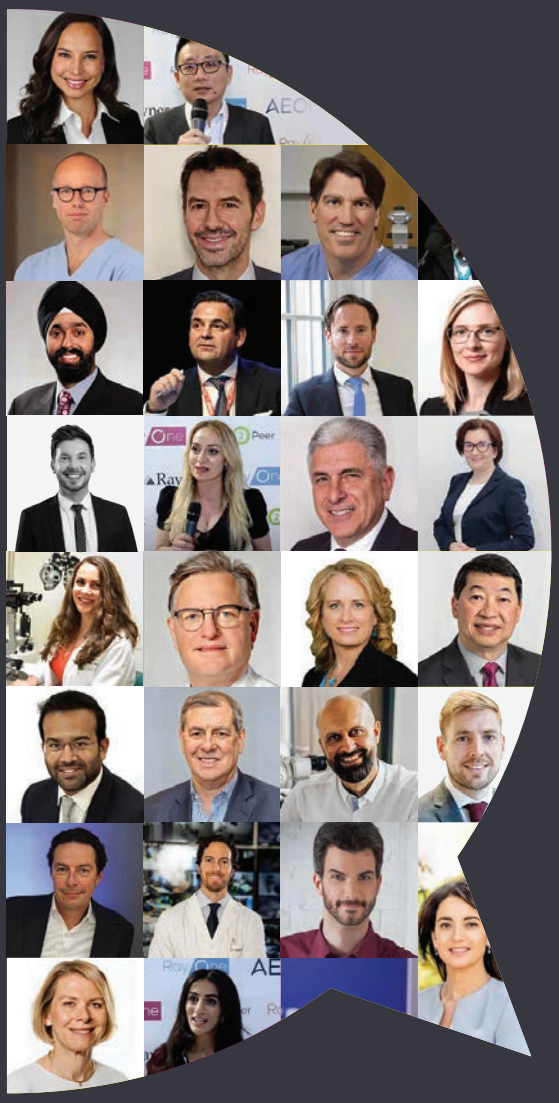

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