

## Top Innovators Delve into Latest Concepts at G360's New Horizons Forum

By William Freeman

Two of ophthalmology's leading innovators headlined the New Horizons Forum at the Glaucoma 360 meeting.

Sean Ianchulev, MD—arguably the most prolific ophthalmic product inventor in the US—led off the meeting with the keynote lecture, titled “The Innovation Journey of an iDoctor.” He shared his winding road to become an innovator and surgeon, then described the glaucoma products he is focused on now.



Sean Ianchulev, MD, MPH

Ianchulev is currently a professor of ophthalmology at New York Eye and Ear of Mount Sinai, where he also directs the program for technology and innovation.

In addition, he is the founder and executive chairman of Eyenovia, Iantrek, and RemoniHealth.

Ianchulev said he grew up on the other side of the iron curtain in Communist Bulgaria.

His mother was a retina surgeon and chief of a hospital department of ophthalmology. As he spent time with her and her patients, he fell in love with the medical field.

Yet he was impatient as a teenager under the Communist system.

When the Berlin Wall came down in 1989, he escaped to the US with just \$200 in his pocket to pursue his undergraduate studies and eventually an education in ophthalmology.

Ianchulev ultimately received his medical degree and a master's of public health from Harvard University and completed his specialty training at the Doheny Eye Institute.

Among his numerous inventions are the miLoop and miCor 700 cataract surgery devices (purchased by Carl Zeiss Meditec), ORA diagnostic system (purchased by Alcon), CyPass glaucoma stent (purchased by Alcon), and the Optejet microdose smart delivery system for topical therapeutics (developed by Eyenovia). Also, his robotics team at New York Eye and Ear worked with Preceyes in developing the first robotic cataract surgery system.

### Iantrek Allograft Biotissue Stent

More recently, as president and CEO of Iantrek, he has invented the Iantrek allograft biotissue stent for glaucoma.

The stent is implanted in the supraciliary space to enhance uveoscleral outflow, one of the two most important outflow pathways in glaucoma, yet one that is underutilized.

The stent includes a cyclodialysis microcannula, named the CycloPen, for implanting the device.

Ianchulev lamented that there are no glaucoma drainage devices



Illustration of the CycloPen delivery handpiece for the Iantrek allograft biotissue stent for glaucoma

approved in the US to enhance uveoscleral outflow, which led him to work in this area.

Ianchulev pointed to advantages of the Iantrek device, including its material. The highly porous hydrophilic matrix material and its permeable substrate are designed to minimize fibroblast response.

This hardware-free device has already been implanted in glaucoma patients, with one-year follow-up results shown at the 2023 American Academy of Ophthalmology meeting. The data demonstrated a reduction in intraocular pressure (IOP) from a baseline of 22.4 mmHg with 1.3 medications to 13.2 mmHg and 0.5 medications.

Ianchulev said he envisioned the biotissue material being used as a supraciliary bio-scaffolding for the reinforcement of a cyclodialysis reservoir, reformation of a sclerotomy, and occlusion (closing) of aberrant cerebrospinal fluid serous ingress. Many researchers are looking at how cerebrospinal fluid entry into the optic nerve is altered in glaucoma.

### Other Ianchulev Projects

In addition, Ianchulev is preparing an initial launch of the T-Rex trabeculorrhexis/canalotomy device, the first system designed to perform circumferential flexible goniotomy.

At Eyenovia, Ianchulev developed the Optejet, a novel drug delivery device that delivers 80 percent less drug volume than standard eye droppers.

Ianchulev is also a leading advocate for office-based cataract surgery, having co-authored an article on the

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topic in the American Academy of Ophthalmology's journal, *Ophthalmology*, in 2016. It showed the outcomes of more than 21 thousand cases in the US demonstrated equivalent safety and effectiveness to hospital and ASC cataract surgery.

While Ianchulev clearly has achieved much in the way of innovation, he ended his lecture by reminding the audience that it takes a village to bring innovative technologies to the market.

### Ike Ahmed, MD, Looks at Future of Interventional Glaucoma

Ike Ahmed, MD, FRCS, discussed the future of interventional

level of glaucoma severity to choose an option for a patient.

One of the greatest challenges today for the glaucoma surgeon is selecting the best option to treat different stages of the disease, given the more than 25 surgical product options available today.

Ahmed emphasized the importance of earlier intervention, referring to a study by Caprioli in the 2008 *American Journal of Ophthalmology* on the effect of timing and intervention on the rate of



Ike Ahmed, MD, FRCS

earlier intervention as a way to slow the progression of glaucoma. As Ahmed put it, “Glaucoma is only young once,” meaning that doctors have only one chance to impact a patient's outcome before it's too late.

He said he views the current mindset in glaucoma to be passive, noting that it can be convenient to wait before intervention, but this is often not the best path for the patient.

Glaucoma patients often experience compliance issues with their medications, with some being asked to instill three or more drops and failing to follow the planned treatment schedule.

Ahmed said he considers medications and more invasive