

EDUCATION

World Glaucoma Week 2017

AEVR Briefing Focuses on Translating Glaucoma Therapy from Bench to Bedside



DECADE OF VISION
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Alliance For Eye And Vision Research



Featured speaker Malik Y. Kahook, M.D. (University of Colorado School of Medicine)

On March 9, AEVR held its *World Glaucoma Week 2017* Congressional Briefing, co-hosted by all major glaucoma societies and research organizations (see box below). Entitled *Translating Glaucoma Therapy from Bench to Bedside*, the event featured NEI-funded clinician-scientist Malik Y. Kahook, M.D., who serves as the Slater Family Endowed Chair in Ophthalmology at the University of Colorado Anschutz Medical Campus in Denver. He also serves as the Vice Chair of Clinical and Translational Research and Chief of the Glaucoma Service and Co-Director of Glaucoma Fellowship in the Department of Ophthalmology. He specializes in the medical and surgical treatment of glaucoma and cataracts, and his research focuses on multiple unmet needs including advanced cataract surgery devices and implants, novel glaucoma therapies, treatment of macular degeneration, and advanced imaging techniques.

Glaucoma, the second leading cause of blindness that affects more than 60 million individuals worldwide, is a neurological disease affecting the optic nerve and causing loss of peripheral vision—and ultimately blindness. It affects more than 2.7 million Americans over age 40, with that number estimated to more than double by year 2050. It includes both diagnosed and undiagnosed cases, as often individuals are unaware they have the disease until vision is lost. It is a driving factor—along with cataract and diabetic retinopathy—in the annual cost of vision impairment reaching \$373.2 billion by

year 2050, or \$717 billion when adjusted for inflation, as estimated in a 2014 report issued by Prevent Blindness.

Certain characteristics such as age, ethnicity, and optic nerve appearance are associated with disease development. Groups at highest risk include African Americans over age 40, individuals over age 60—especially Mexican

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—Dr. Kahook

Americans, and those with a family history of the disease. Elevated intraocular pressure (IOP) is a significant risk factor for developing glaucoma. Although not all forms of glaucoma have “high” IOP, its reduction is the basis for all treatments. In its most common form—primary open angle glaucoma (POAG)—nerve damage results from high IOP, which occurs when the fluid that circulates in and out of the front part of the eye drains too slowly. NEI-funded research has resulted in pressure-reducing drug regimens, and NEI’s *Ocular Hypertension Treatment Study (OHTS)* found that pressure-reducing eye drops delayed disease onset. In addition to drug regimens, glaucoma is also treated through conventional surgery—which makes a new opening for fluid to leave the eye—and trabeculectomy, where laser therapy results in enhanced flow of fluid out of the eye.

Since the average glaucoma patient is treated for 14 years with an IOP-reducing drug regimen, their adherence is important in disease management. Yet, studies have found a non-adherence rate of from 50 to 75 percent, often due to a variety of factors including physical limitations of age, forgetfulness, frequency of dosing and number of medications, side-effects, and cost. Although researchers have developed adherence aids—such as uniform cap colors for glaucoma therapies, simplifying drug regimens, and developing dosing reminders and positioning devices—these have not been widely adopted, primarily since human factors have not been adequately addressed.

Dr. Kahook discussed a new concept called “Guided Administration of Pharmaceuticals” or “GAP” Therapy in which breakthroughs are developed that have the following characteristics: patient independent, physician-administered and monitored, safety profile equal to or better than previous therapies, long duration or efficacy, repeatable for lifetime of the patient, and 100 percent adherence.

He described four types of GAP Therapy breakthroughs, including: punctal plugs, in which devices are placed in the tear drainage ducts to slowly deliver drugs to the tear film; sub-conjunctival depots that provide long-term delivery of drugs to the eye; ocular surface inserts that are minimally invasive and provide

significant flexibility to deliver multiple drugs for glaucoma treatment; and intra-ocular injections that represent an invasive method for delivering biodegradable drug-eluting pellets that deliver therapy over months to decrease IOP. He described the pros and cons of each, especially with respect to their lifetime efficacy in comparison to a traditional glaucoma drug regimen. He also discussed new developments in minimally invasive drug delivery, including a long-term active drug depot punctal plug, developed in his laboratory at the University of Colorado, which addresses many of the shortcomings that lead to poor adherence.

Dr. Kahook emphasized that, although topical glaucoma drug therapies will remain primary despite adherence concerns, alternative approaches will become common—overcoming the hurdles to adoption—and that the pace of innovation suggests that drops may not be the primary method of treatment in a decade. He concluded by observing that enhancing glaucoma care and finding treatments will require extensive basic research, and that breakthroughs are not singular events but the result of decades of research. Curing glaucoma will require federal funding for that research and to keep the talent pool—especially emerging vision scientists—engaged. And, most importantly, we should remember that this work requires the active engagement of patients.



Dr. Kahook with Fauzia Khan, M.D., a Health Policy Fellow in the office of Cong. Diana DeGette (D-CO), which he visited that morning under the auspices of NAEVR. Cong. DeGette serves on the House E&C Committee, which has authorizing authority over NIH.

NAEVR Position Remains Firm on \$2 Billion NIH Increases

Irrespective of the President’s FY2017 and FY2018 budget proposals, NAEVR’s funding positions have not waived, urging Congress to:

- Support the \$2 billion FY2017 NIH funding increase to \$34.1 billion, as proposed by the Senate Appropriations Committee, and a \$2 billion FY2018 increase over FY2017 funding. These increases to the NIH base would be in addition to the supplemental funding for specific projects in the *21st Century Cures Act*, reflecting real growth above biomedical inflation.
- Support FY2018 NEI funding at \$800 million, building upon the Senate-proposed FY2017 NEI funding level of \$741 million.

About World Glaucoma Week 2017...

The first *World Glaucoma Day* was held on March 6, 2008, and the United States House of Representatives passed H.R. 981, which recognized the event and supported the NEI’s efforts to research the causes of and treatments for glaucoma. Since 2010, the day has expanded into a week of educational events held worldwide, with all major glaucoma professional societies and research organizations co-sponsoring AEVR’s 2017 event, including:

- Research to Prevent Blindness (RPB)
- American Glaucoma Society (AGS)
- ARVO
- Glaucoma Research Foundation (GRF)
- Optometric Glaucoma Society (OGS)