summer 2021

scheie vision

Penn Medicine | Department of Ophthalmology

VIRTUAL REALITY:

New Method to Assess Functional Vision

IN THIS ISSUE

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A MESSAGE FROM THE CHAIR

Welcome to the summer edition of *Scheie Vision*. Despite the challenges we continue to face, our Department has advanced progress in research, education, patient care, and community service. You can read about each of these missions, as well as how our Department has remained proactive in the fight against COVID-19, in this issue.

Our researchers continue to make impactful developments, including conducting research on COVID-19. Dr. Kenneth Shindler is collaborating with researchers worldwide to study the potential of neem bark extract to limit the cell-to-cell spread of SARS-CoV-2, the virus that causes COVID-19. This issue also features a recent collaboration between Gyroscope Therapeutics and UPenn to develop gene therapies for blinding eye diseases. In addition, we highlight a study on the use of virtual reality technology to evaluate the functional vision of patients with inherited retinal diseases, including those who have been treated with gene therapy. You can also read about a study led by Dr. Juan Grunwald that showed that progression of retinopathy is strongly associated with a higher incidence of cardiovascular disease events in patients with chronic kidney disease. Finally, we provide exciting news about a $6.6 million grant renewal to further investigate glaucoma genetics in African Americans.

In this edition, we also highlight our missions to provide outstanding patient care and to support underserved populations. We share the projects of two Penn Medicine CAREs grant recipients, Dr. Ranjoo Prasad and first year resident Brian Nguyen. Both initiatives support patient needs that were created by the COVID-19 pandemic. We also highlight a glaucoma awareness campaign that provided free screenings to Black individuals in Philadelphia. Recently, the team published articles in *Preventive Medicine Reports* and *Health Communications* that analyzed these efforts.

This year, the Department has hosted several live virtual events spotlighting the incredible advances in patient care and research made by our faculty, including Drs. Mina Massaro, Jean Bennett, and Ranjoo Prasad. We also highlight achievements from our featured alumnus, Dr. George Kurz, who recently published a book about his many years in medicine.

We also include memories and stories about Dr. Jane Portnoy from her colleagues and friends. Dr. Portnoy sadly passed away on March 28, 2021, surrounded by her family. She was a treasured member of our Department for the past 20 years. Among her many accomplishments, Dr. Portnoy was the first woman board-certified ophthalmologist in the Commonwealth of Kentucky. The Department plans to sponsor an award for the graduating medical student who best embodies the extraordinary courage, compassion, and humanitarian spirit exhibited by Dr. Portnoy.

I would like to express my utmost gratitude and appreciation to the faculty, staff, trainees, alumni, patients, and friends who continue to make Scheie an exceptional institution. As we navigate these difficult times, the remarkable efforts of each and every one of you have allowed us to preserve and propel the missions of the Scheie Eye Institute. I hope these articles provide hope and encouragement, and I wish you all a safe and healthy summer.

Sincerely,

Joan O'Brien, MD

GLAUCOMA AWARENESS CAMPAIGN PROVIDES FREE SCREENINGS TO BLACK INDIVIDUALS IN PHILADELPHIA

By Rebecca Salowe

In 2018 and 2019, a team at the Scheie Eye Institute conducted a multimedia messaging campaign throughout Philadelphia on glaucoma risk in Black individuals. Recently, the team published articles in *Preventive Medicine Reports* and *Health Communications* that analyzed these efforts. These articles focused on the yield of messaging approaches and the personal experiences of participants, respectively.

WHY A CAMPAIGN?

Black individuals are underrepresented in medical research and face inequalities in access and quality of care. Glaucoma is one disease that exemplifies this disparity.

"Individuals of African descent are five to six times more likely to be diagnosed with glaucoma than European Americans, and up to 15 times more likely to experience vision loss from this disease," said Joan O'Brien, MD, Chairman of the Ophthalmology Department. "However, the majority of glaucoma studies to date have been conducted in cohorts of European or Asian descent. This not only limits understanding of disease biology, but also impedes translation of findings into clinical action for the most affected group."

Dr. O'Brien is the Principal Investigator of a glaucoma genetics study in African Americans, which has enrolled over 10,200 individuals since 2010 to address this disparity. In 2018, the Primary Open-Angle African American Glaucoma Genetics (POAAGG) study team launched a multimedia messaging campaign throughout the city of Philadelphia.

The campaign had three main goals. First, the team aimed to increase awareness of elevated glaucoma risk in Black individuals, emphasizing the importance of early treatment to prevent irreversible vision loss. Up to 50% of individuals with glaucoma are unaware that they have this disease. Second, they sought to provide free glaucoma screenings to any interested individuals, especially those without access to healthcare providers or insurance. Finally, these individuals were offered the opportunity to enroll in the POAAGG study, if eligible.

"We saw these goals as complementary," explained Dr. O'Brien. "We sought to address the more immediate need to provide earlier diagnosis and treatment to patients without access to care, but also to contribute to the long-term goal of discovering genetic variants associated with this disease and improving treatment options for future generations."

The team chose to pursue these goals through a marketing campaign due to a strong precedent for using this approach. Prior groups have shown that marketing campaigns strengthen community connections and are a powerful method to recruit underrepresented populations to research studies.

A VARIETY OF MESSAGING STRATEGIES

The campaign consisted of multiple unique messaging approaches to reach the target audience. The majority of approaches stemmed from a partnership with WURD Radio, the only Black-owned health talk radio station in Pennsylvania. With WURD Radio, the study team recorded commercials, patient testimonials, physician interviews, and show sponsorships. Messages mentioned the importance of early diagnosis and the availability of free glaucoma screenings, while also emphasizing that glaucoma is familial and disproportionately affects the Black community.

"We were connected to WURD Radio and met with Sara Lomax-Reese (President and CEO) and Monica Lewis (Director of Sales and General Manager), where we learned about their commitment to addressing racial health inequities in Philadelphia through messaging to their loyal listeners," said Ava Kikut, a current PhD student

A community member receives visual acuity testing at an outreach event.

at Annenberg School for Communication who previously worked on the campaign. "Their openness to working with us to help others learn about glaucoma was integral to this project. And so began a meaningful partnership."

In addition to messaging approaches with WURD Radio, the study team also created postcards, outreach event flyers, and social media posts to reach the Black community.

All messaging approaches provided a phone number to call to schedule a free glaucoma screening. Individuals were scheduled in either a private screening room at the Scheie Eye Institute or at a future outreach event. Exams were conducted by fellowship-trained glaucoma specialists and included a full suite of glaucoma equipment to allow for certain diagnosis.

"The glaucoma screenings were useful in recruiting patients from the community to the POAAGG study, but their deeper importance lay in connecting community members with key glaucoma care resources," said Selam Zenebe-Gete, the lead Clinical Research Coordinator for the POAAGG study. "The glaucoma specialists consulted with patients on their screening results and potential treatment options. Participants could also opt in to be contacted post-screening for help with insurance concerns and setting up regular appointments at Scheie."

COMPARING THE EFFICACY OF MESSAGING APPROACHES

At the conclusion of the campaign, the study team sought to understand which messaging approaches were most effective. This information could help inform future campaigns or recruitment efforts in minority populations.

Throughout the campaign, the team carefully tracked how many phone calls resulted from each messaging approach, using the TrialX iConnect recruitment tracking and analytics system. The results of this investigation were published in *Preventive Medicine Reports* in 2020.

Overall, the six-month campaign led to 154 patient inquiries, with a total of 98 individuals receiving free screenings with glaucoma specialists. Additionally, 60 of these individuals enrolled in the POAAGG study.

WURD approaches reached the largest audience, with 77% of inquiries arising from these efforts. In particular, commercials were the most successful in reaching the target population, likely due to their high frequency. From a financial perspective, print methods (such as postcards) were the most inexpensive, but reached a smaller number of individuals.

"Overall, the campaign showed us that commercials played at high-frequency through a trusted community resource, as well as postcards distributed at targeted healthcare locations, are particularly effective and affordable options for connecting with the African American community," said Dr. O'Brien. "Our hope is that these findings can help inform outreach and recruitment efforts for other understudied diseases in minority populations. The collegiality and trust that developed between community leaders and the study group was reinforced by working together as a team to serve this community."

INTERVIEWING THE PARTICIPANTS

The study team also sought to understand what influenced individual decisions to respond to the campaign. The 60 patients who enrolled in the POAAGG study were asked to participate in open-ended interviews about their

Participants were provided with free glaucoma screenings in a private screening room at the Scheie Eye Institute.

The POAAGG study team at an outreach event on 10/20/2018 at Vaux Big Picture High School.

The community outreach coordinator asked each participant the following open-ended interview questions:

Q1	Can you tell me how you feel about having participated in this study?
Q2	What were your reasons for participating in this study?
Q3	Did you have any reservations about participating in this study? If so, what?
Q4	If Q3 = yes: How did you overcome those reservations? If Q3 = no: What made you feel comfortable about calling to participate?
Q5	How did your experience participating in this study affect your feelings about research?
Q6	How did you feel about participating in genetic research prior to this experience?
Q7	What is your answer when you are asked what your race or ethnicity is?
Q8	What significance, if any, did your racial/ethnic identity play in your decision to participate in this study?
Q9	If we asked you how to motivate other people who are Black/African American to participate in research studies, what would you answer?

experience. Questions focused on motivations, reservations to join the study (and how they were overcome), feelings on genetic research, and how (if at all) African ancestry influenced the decision to enroll.

"The majority of participants expressed interest in potentially being involved with other research opportunities because of the positive impact the campaign had on the African American community," said Marquis Vaughn, Community Outreach Coordinator, who conducted the interviews. "The combination of awareness, medical intervention, and customized access to care can be attributed to the success of the campaign."

In total, 50 interviews were recorded with the consent of participants and were transcribed. The study team then conducted thematic analysis of the interview transcripts, guided by the integrated behavior model (IBM). Their findings were published in *Health Communications* in December 2020.

Overall, the study team found that the decision to enroll in the study was strongly influenced by a desire to learn more about personal health and to contribute to future care options for others. An important normative influence that encouraged enrollment was hearing about the study from a respected community media outlet, friends, and family.

Roughly one-third of respondents mentioned past and current racial discrimination in medical research as an important sociocultural frame within which they considered participation. Importantly, this was not an absolute barrier to participation, and could be overcome through a focus on the mutual goals of bettering the health of individuals and of others.

"Our research helps demonstrate how truly partnering with Black community members and leaders in Philadelphia can help researchers overcome distrust by emphasizing the value of the research in benefiting others, offering medical care during research appointments, removing barriers to access, and creating pathways of communication that emphasize improving health in the community," said Mohima Sanyal, a prior MD/MPH student at the University of Pennsylvania who worked closely on this study. "We are deeply grateful to all those who participated in this study and offered their insights and suggestions about which aspects of this research study motivated their participation." ■

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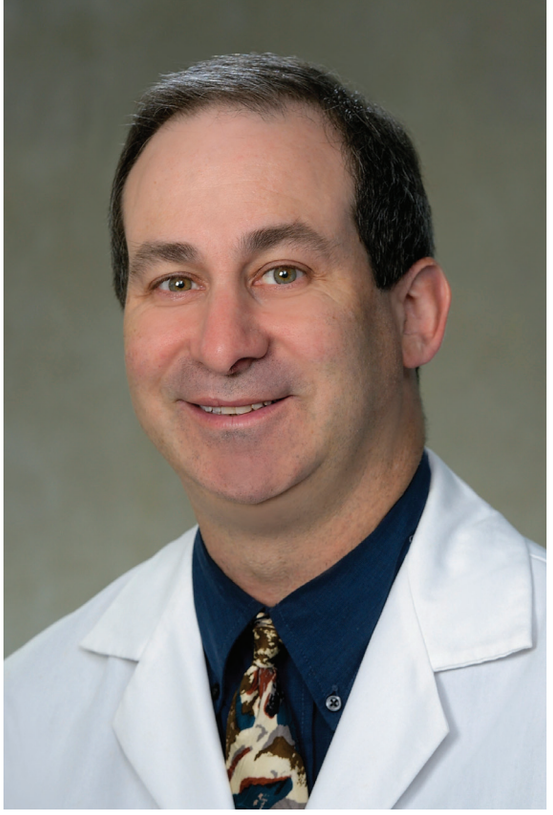
Ahmara Ross, MD, PhD



Kenneth Shindler, MD, PhD

Jean Bennett, MD, PhD (Daniel Burke Photography)

GYROSCOPE THERAPEUTICS

AND UPENN ANNOUNCE RESEARCH AGREEMENT TO DEVELOP OCULAR GENE THERAPIES

By Rebecca Salowe

In December 2020, Gyroscope Therapeutics Limited announced a research agreement with the University of Pennsylvania (UPenn) and Penn Center for Advanced Retinal and Ocular Therapeutics (CAROT) to develop gene therapies for three blinding eye diseases.

The team at UPenn will be led by four investigators with expertise in ocular gene therapy: Jean Bennett, MD, PhD, F.M. Kirby Professor of Ophthalmology; Ken Shindler, MD, PhD, Associate Professor of Ophthalmology; Ahmara Ross, MD, PhD, Assistant Professor of Ophthalmology; and Paris Margaritis, DPhil, Research Assistant Professor of Pediatrics at Children's Hospital of Philadelphia.

Dr. Bennett, who serves as the Co-Director of CAROT, pioneered the research that led to the first FDA-approved gene therapy for an inherited disease. This gene therapy successfully restored vision in children and adults with a retinal degeneration caused by mutations in the *RPE65* gene. For this accomplishment, Dr. Bennett was the co-recipient of the 1M euro Champalimaud Vision Award, $1M Sanford Lorraine Cross Award, and $1M Sanford and Susan Greenberg Outstanding Achievement Prize.

Dr. Shindler and Dr. Ross have extensive experience establishing *SIRT1* as a key target for preventing optic nerve degeneration. They showed that gene therapy using *SIRT1* as a therapeutic target enhances cell survival pathways after inflammatory, compressive, and glaucomatous damage to the optic nerve. Most recently, they published a study demonstrating that cell-specific delivery of *SIRT1* gene therapy can rescue retinal ganglion cells in optic nerve injury.

"Together, these experiences will help us to advance the potential of gene therapies to treat multiple eye diseases," said Dr. Shindler.

Gyroscope Therapeutics is a clinical-stage gene therapy company focused on eye diseases. Gyroscope's lead investigational gene therapy, GT005, is being evaluated for its potential to slow progression of geographic atrophy secondary to dry age-related macular degeneration (AMD). This investigational therapy received Fast Track designation from the Food and Drug Administration and is currently in Phase II clinical trials.

The research collaboration with UPenn will focus on the development of gene therapies for optic neuritis, retinitis pigmentosa, and glaucoma. Gyroscope will have

an exclusive option to the intellectual property associated with and resulting from the research conducted under this agreement.

> Gyroscope is expanding the potential for development of approaches that can be used to treat large numbers of patients suffering from devastating blinding diseases."

"Currently, optic neuritis and retinitis pigmentosa do not have effective treatments to reduce vision loss, and glaucoma is a leading cause of irreversible vision loss worldwide due to treatment failure in many patients," explained Dr. Shindler. "Development of novel treatments, therefore, holds tremendous potential to reduce vision loss."

The collaboration will harness the complementary expertise of Gyroscope and UPenn investigators.

"Gyroscope is an international company with expertise in benchwork science, fast-tracking investigational gene therapies, and moving an investigational gene therapy from preclinical models to clinical trials," said Dr. Shindler. "Our investigators have expertise in pioneering retinal gene therapies and investigating the *SIRT1* signaling pathway for neuroprotection."

"This partnership will help to advance our pre-clinical work," added Dr. Ross. "If the research proves to be positive, Gyroscope has the expertise to help bring these investigational therapies into the clinic."

The teams hope to generate adeno-associated virus (AAV) technology for use in multiple retinal degenerations and optic neuropathies, regardless of their underlying genetic etiology. Most ocular gene therapies under investigation target a specific genetic mutation and cannot be used more broadly.

"By focusing on treatments that target pathways for neuroprotection in both optic nerve disease and retinitis pigmentosa, Gyroscope is expanding the potential for development of approaches that can be used to treat large numbers of patients suffering from devastating blinding diseases," said Dr. Bennett.

"The prior success of Dr. Bennett's gene therapy makes us extremely hopeful that our focus on a therapy that has shown early promise in preclinical studies, in collaboration with Gyroscope, may allow us to evaluate novel gene therapies aimed at a broad range of optic nerve and retinal diseases," added Dr. Ross. ■

147 years

department celebrates 147 years

By Alexandra Brodin

The 49th Anniversary of the Scheie Eye Institute and 147th Anniversary of the University of Pennsylvania (UPenn) Department of Ophthalmology were celebrated virtually on Saturday, April 17, 2021. This annual continuing medical education (CME) conference, which featured presentations by ophthalmology faculty and residents in all subspecialties, was attended by more than 135 individuals. Each of the five panel sections was followed by engaging dialogue with attendees who submitted questions during the presentations.

The Scheie Eye Institute welcomed Raymond S. Douglas, MD, PhD as the Annual Honored Alumnus Lecturer. Dr. Douglas is a plastic and reconstructive surgeon and the Director of the Thyroid Eye Disease Program at Cedars-Sinai Medical Center in Los Angeles, CA. He earned his MD and PhD at UPenn and completed his residency at the Scheie Eye Institute. He went on to pursue a fellowship at the UCLA Stein Eye Institute. Dr. Douglas gave a presentation on novel treatments for thyroid eye disease.

The 15th Annual David M. Kozart Memorial Lecture was given by Irving M. Raber, MD. Dr. Raber served as Chief of the Cornea Service at the Scheie Eye Institute from 1979-1986. He is currently an ophthalmologist on the Cornea Service at Wills Eye Hospital and an Assistant Clinical Professor of Ophthalmology at Thomas Jefferson University. Dr. Raber presented an overview of the evolution of cornea transplants over the course of his extensive career in ophthalmology.

The Scheie Eye Institute is grateful to our two honored speakers for sharing their time and expertise, and to all who participated in our Alumni Event. We hope to gather and celebrate together in person in the not-so-distant future. ■

RESEARCHERS AWARDED $6.6 MILLION GRANT RENEWAL TO STUDY GLAUCOMA GENETICS IN AFRICAN AMERICANS

By Rebecca Salowe

Researchers at the Scheie Eye Institute have been awarded a five-year, $6.6 million National Eye Institute (NEI) grant renewal to investigate genetic variants associated with primary open-angle glaucoma (POAG) in African Americans. This grant builds upon the original $11.2 million study, funded in 2014, which recruited and genotyped 10,255 African American individuals from Philadelphia.

"In our original grant, we focused on enrolling African Americans from the Philadelphia community, genotyping these individuals, and identifying variants associated with this disease," explained Joan O'Brien, MD, Principal Investigator of the Primary Open-Angle African American Glaucoma Genetics (POAAGG) study. "Now, we seek to understand the biological importance of these variants. Our long-term goal is to translate this information into more personalized and targeted diagnostic and therapeutic strategies for this overaffected and understudied population."

POAG is a familial disease that affects 53 million individuals worldwide, with African Americans facing a disproportionate burden of disease. Current treatment options aim to lower the pressure in the eye but are insufficient to prevent vision loss in roughly one-third of patients.

"Our findings suggest that POAG has additional underlying disease mechanisms that are independent of elevated eye pressure," said Dr. O'Brien. "We know that there is a genetic component to the disease, as family history has a strong influence. Genetic studies can help to elucidate other disease mechanisms, providing further therapeutic targets."

African Americans are five times more likely to be affected by POAG than European Americans and up to 15 times more likely to experience subsequent vision loss. Despite this increased burden of disease, the majority of genetic studies of POAG have focused on populations of European and Asian descent. Many of the variants discovered in these

The POAAGG study team in 2019.

> We hypothesize that glaucoma, much like cancer, is not one, but many diseases with various underlying causes and genetic differences."

studies do not replicate in the genetically diverse African American population.

The POAAGG study sought to address this disparity. Over its five years of funding, the study enrolled 10,255 African American individuals from the city of Philadelphia. These individuals were recruited from ophthalmology clinics at the University of Pennsylvania (UPenn) and external sites, the Penn Medicine Biobank, and community outreach efforts.

"Community outreach was an essential part of this study," said Marquis Vaughn, Community Outreach Coordinator. "We sought to reach individuals without access to care through many different methods throughout the years. For example, we purchased a van to conduct free glaucoma screenings throughout the city. We also partnered with local community leaders and radio stations to spread word about the study and glaucoma risk."

A genome-wide association study (GWAS) was performed on cases and controls in this population, using a SNP array with custom content to maximize coverage of variants in admixed populations. Whole-exome sequencing was also completed on subjects in collaboration with the Regeneron Genetics Center.

The POAAGG study also collected extensive phenotypic information on glaucoma cases during exams by glaucoma specialists. These measurements ranged from more traditional clinical values, such as intraocular pressure and visual field testing, to more precise and unique measurements taken from images in the Scheie Image Reading Center.

"POAG is a heterogenous disease with a broad range of trait representation," explained Harini Gudiseva, Lab Director for the Ocular Genetics Laboratory and Project Manager for the POAAGG study. "Thus, it is also important to identify variants associated with specific phenotypes. These findings can help to identify subgroups of the disease and improve predictive models for development, progression, and intervention."

The five-year grant renewal will further leverage the vast amount of genetic data collected in the initial period of the grant. The team is seeking to validate and investigate additional variants for African American POAG using several orthogonal approaches.

First, the team plans to perform post-GWAS analyses in collaboration with Marylyn Ritchie, PhD, Director of the Center for Translational Bioinformatics at UPenn. These analyses include constructing a disease risk model, conducting a meta-analysis, and correlating phenotypes with genetic variants. They will also analyze the extensive exome sequencing data to identify rare and familial variants resulting in POAG.

In parallel, the team plans to use structural genomic approaches to explore 3D interactions in the genome. This analysis, conducted with Struan Grant, PhD, Director for the Center for Spatial and Functional Genomics at Children's Hospital of Philadelphia, will help to identify the true effector gene associated with a variant. Importantly, this is the very first application of this novel methodology to POAG.

Finally, the study will evaluate the functional significance of POAG-associated variants using novel cell-based and animal model systems.

"Functional studies aid in integrating causal variants/SNPs to downstream molecular pathways and allow us to capture biological insights into evaluating POAG risk and pathogenesis," said Venkata Ramana Murthy Chavali, PhD, Research Assistant Professor of Ophthalmology and Co-Investigator on the POAAGG study. "This integrated multi-omics approach, together with functional analysis, will accelerate our understanding of POAG and lead to the development of promising therapeutic targets."

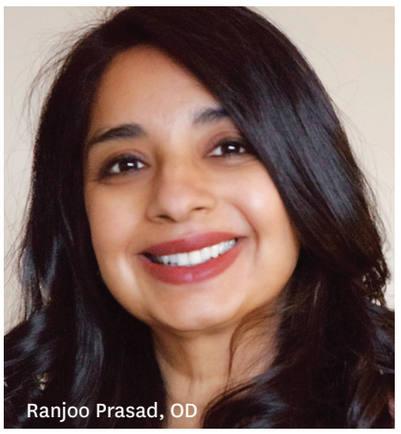
The long-term goals of this grant renewal are to define the genetic subtypes of POAG and to develop more targeted diagnostic and therapeutic interventions.

"We hypothesize that glaucoma, much like cancer, is not one, but many diseases with various underlying causes and genetic differences," said Dr. O'Brien. "If proven to be true, we can then name the subtypes of disease and develop precise, targeted treatments for each form." ■

PENN MEDICINE CARES: OUR COMMITMENT TO SERVICE DURING COVID-19

By Kristen Mulvihill

Brian Nguyen, MD (left) and Daniel Choi, MD (right), a second year resident, testing out the new mask.



Ranjoo Prasad, OD

In the fall of 2020, Ranjoo Prasad, OD, Director of the Penn Center for Low Vision Rehabilitation, and Brian Nguyen, MD, first year ophthalmology resident, received Penn Medicine CAREs grants for two community-related projects.

The Penn Medicine CAREs Grant program provides institutional support each year to faculty, staff, and trainees who volunteer their time to serve the community. CAREs grant recipients exemplify the values of Penn Medicine and its commitment to make an impact through various service initiatives. Now more than ever, these initiatives are critical to provide support to vulnerable populations during the COVID-19 pandemic.

In collaboration with the Gift of Life Family House (GOLFH), Dr. Prasad is supporting a temporary transportation initiative to allow for continued access to specialty care during the pandemic. GOLFH is a hospitality house for transplant patients and their families who travel to Philadelphia for care. The Family House provides home-like accommodations and supportive services, including meals, activities, and transportation to hospitals for medical care. Though the Family House has remained open during the pandemic, the volunteer-led shuttle program was temporarily halted due to restrictions.

"Providing transportation enabled residents not to worry about navigation in an unknown city and relieved the additional burden of costs for gas, parking, and other means of transport," explained Dr. Prasad, who currently serves on the Advisory Board of GOLFH.

To address this shortcoming, the Family House has been subsidizing the costs for ride-share programs, such as Uber and Lyft. Support from this CAREs grant will continue to offset the ride-share costs and allow patients and their families to access appointments and care during the pandemic. As of March 2021, 485 trips were provided at no charge to guests of the Family House.

"My family had a very young member who had a transplant more than 12 years ago, and we stayed at a similar facility that provided a shuttle service," Dr. Prasad said. "I completely understand the need and importance to support the access for patients and their families during COVID-19."

Similarly seeking to fulfill needs created by the pandemic, Dr. Nguyen launched an initiative to make and distribute comfortable personal protective equipment. Despite the efficacy of face masks, some studies show that masks with elastic ear bands are uncomfortable and may cause pressure injury and headaches. This may result in a decline in compliance. Surgical masks used in the OR have ties instead of bands, making them more comfortable; however, Dr. Nguyen recognized that these masks were not readily available to the public.

In response, Dr. Nguyen made customizable 3D-printed bands that redistribute ear pressure to external hooks on the mask. After trialing some of the National Institutes of Health (NIH) templates of mask attachments, he printed out prototypes at the 3D printing lab at the University of Pennsylvania's Biomedical Library and selected the best design. He printed 100 attachments and initiated a pilot study at Scheie, finding that the hook attachment led to an 80% increase in mask utilization.

To date, Dr. Nguyen has distributed over 500 of these ear savers to vulnerable patient populations at the United Community Clinic. "I wanted to indirectly increase mask usage, especially amongst those in the community who were more likely to have worse health outcomes, such as those who were socioeconomically disadvantaged," he said. ■

worsening retinopathy

ASSOCIATED WITH GREATER INCIDENCE OF CARDIOVASCULAR DISEASE

By Kristen Mulvihill

A recent study led by Juan E. Grunwald, MD, Professor of Ophthalmology, found that progression of retinopathy is strongly associated with a higher incidence of cardiovascular disease events in patients with chronic kidney disease. This finding suggests that patients with worsening retinopathy should be assessed for cardiovascular disease.

Retinopathy is a disease that damages the retina and can cause vision loss. There are many different types and severities of retinopathy, including diabetic retinopathy, hypertensive retinopathy, and retinopathy of prematurity. Cardiovascular disease (CVD), also referred to as heart disease, is a class of conditions involving the heart or blood vessels. Chronic kidney disease (CKD), which leads to renal failure, is often linked to higher rates of both retinopathy and CVD.

The study, published in the *British Journal of Ophthalmology* in February 2021, detailed findings from the Chronic Renal Insufficiency Cohort (CRIC) study. The research team, led by Dr. Grunwald, previously reported results from the Retinopathy in Chronic Renal Insufficiency (RCRIC) study, demonstrating a cross-sectional association between retinopathy and CVD in a group of participants with CKD.

In the CRIC prospective study, trained personnel obtained fundus photographs from both eyes of participants at two timepoints, separated by three and a half years. Graders and a retinal specialist assessed these photographs at a retinal image reading center for the presence and severity of any cause of retinopathy, as well as the diameters of major retinal vessels.

Researchers then investigated the association between progression of retinopathy and concurrent incidence of CVD events, including heart failure, stroke, and peripheral artery disease.

Juan Grunwald, MD

The team discovered a strong correlation between worsening retinopathy and the simultaneous development of CVD. This association remained significant even after adjusting for established CVD and CKD risk factors—such as age, sex, smoking, etc.—suggesting that progression of retinopathy offers additional insight on CVD development beyond that provided by known risk factors. In addition, these results suggest that there may be common mechanisms that cause progression of eye and cardiovascular disease.

Since the progression of retinopathy is strongly associated with the prevalence of CVD, the study suggests that patients with worsening retinopathy should be assessed for CVD.

"Our results suggest that patients with kidney pathology should have their eyes examined and those who show progression of retinopathy should be carefully monitored for worsening of their cardiovascular disease," said Dr. Grunwald. ■

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neem bark extract has the potential to treat COVID-19

By Alexandra Brodin

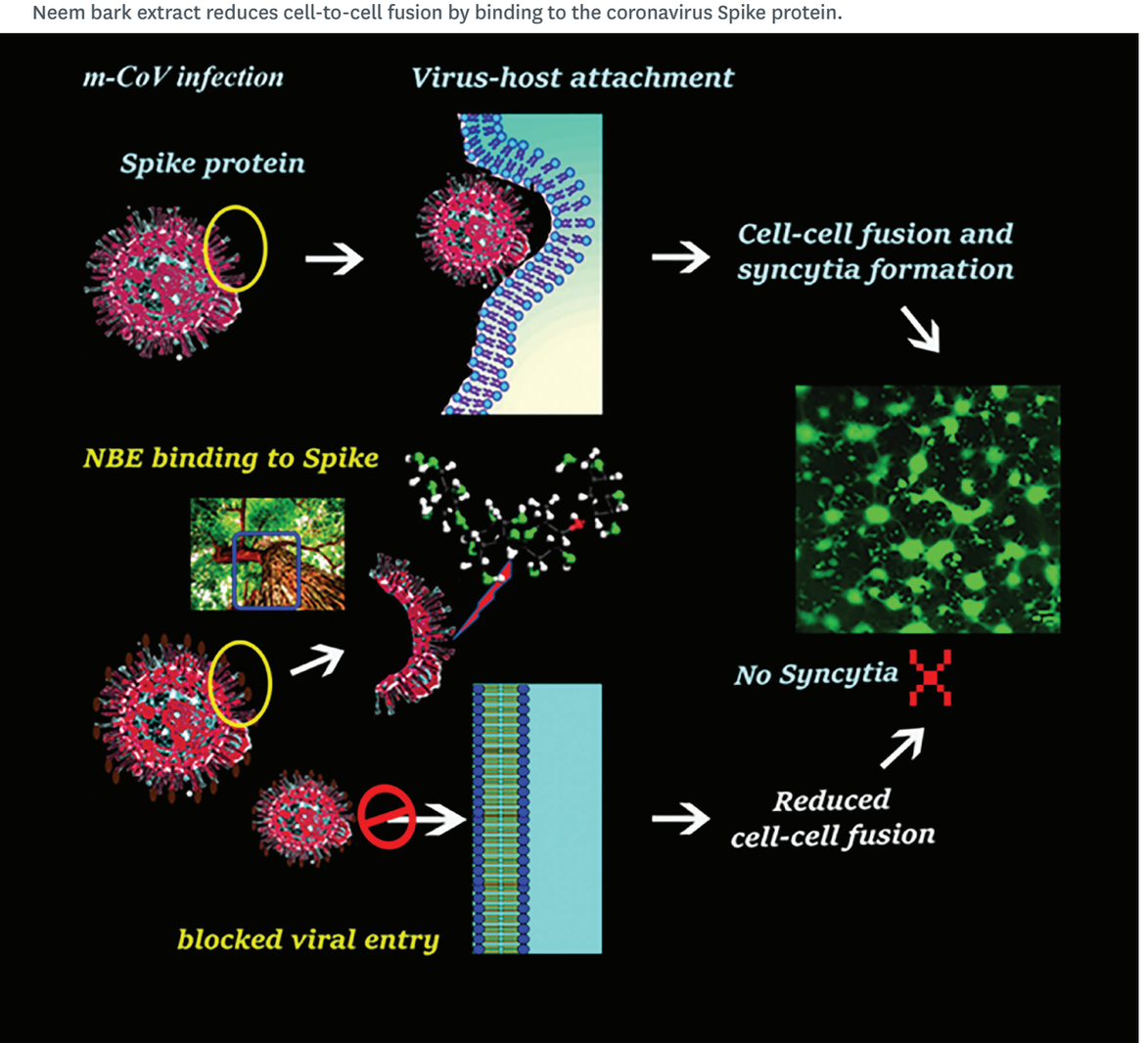
Azadirachta indica (neem) is a type of tree whose bark, leaves, and seeds have long been used in India as traditional phytomedicine. Dr. Jayasri Das Sarma, a Neurovirologist/Neuroimmunologist at the Indian Institute of Science Education and Research (IISER)-Kolkata and an Adjunct Professor in the Department of Ophthalmology at the University of Pennsylvania (UPenn), is leading a large multicenter, cross-disciplinary study on the potential of neem bark extract (NBE) as a therapy for COVID-19. Dr. Das Sarma is collaborating on this study with Dr. Ken Shindler, specialist in neuro-ophthalmology in the UPenn Department of Ophthalmology.

The project, titled 'Leveraging reverse genetics strategies to study structure-function interplay of virus-host attachment spike protein to design therapies for COVID-19,' is funded by the Indo-U.S. Science and Technology Forum (IUSSTF). The award period began in October 2020.

Although neem is widely used for its antifungal and antibacterial properties, its antiviral and anti-inflammatory activities are less well-known. Dr. Das Sarma recently published a study in *Frontiers in Cellular Neuroscience* showing that NBE binds to the Spike protein found in mouse hepatitis virus (MHV), a group 2 coronavirus that serves as a model for neuroinflammatory diseases in humans. In this study, NBE binding to the Spike protein inhibited cell-to-cell fusion and viral replication, effectively reducing neuroinflammation.

The novel coronavirus (SARS-CoV-2) that causes the respiratory disease COVID-19 (as well as SARS, OC43, and other human coronaviruses) also contains the Spike protein, composed of two subunits known as S1 and S2. The Spike protein gives SARS-CoV-2 its characteristic jagged shape and mediates viral entry into host cells. The S1 subunit first binds to a receptor located on the surface of the host cell, and then the S2 subunit fuses the viral and host cell membranes. This way, genetic material from the novel coronavirus enters the host cell and uses the cellular machinery to replicate the virus and spread to other host cells.

Neem bark extract reduces cell-to-cell fusion by binding to the coronavirus Spike protein.

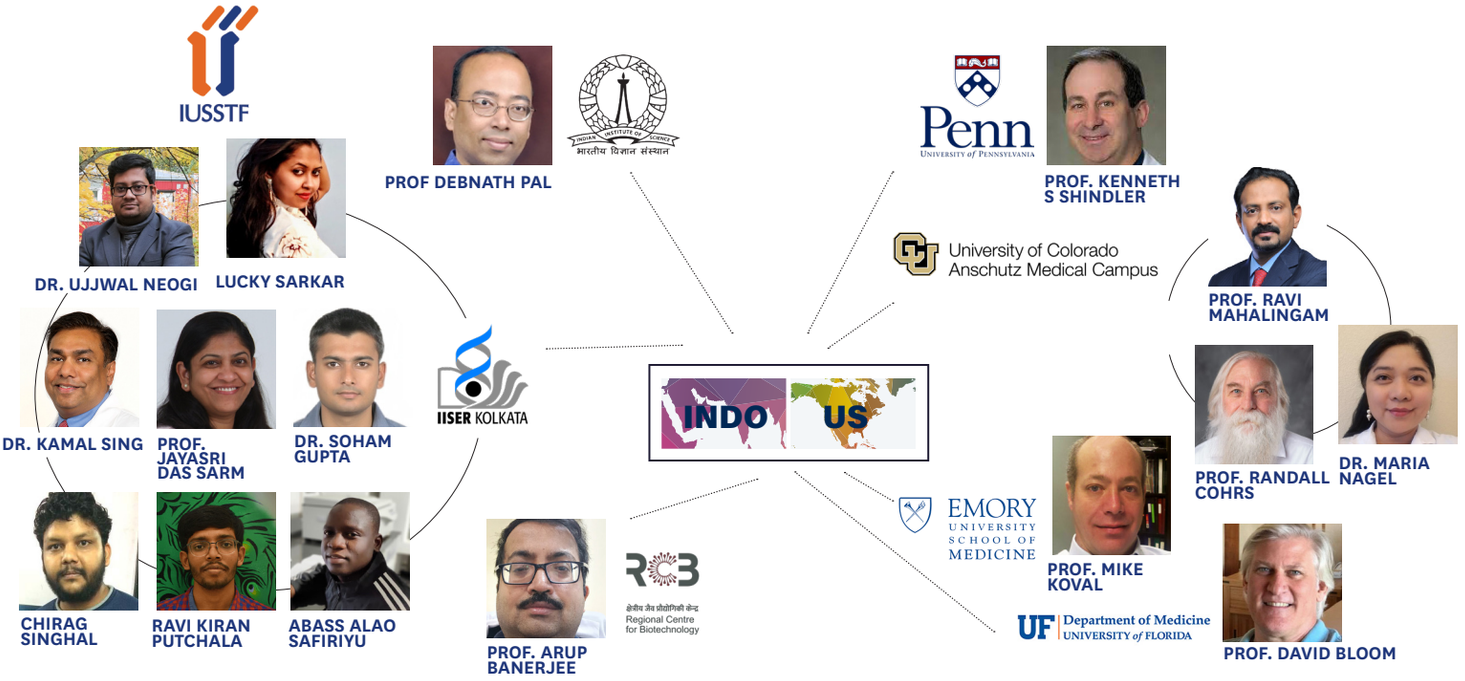


However, if another compound binds to the coronavirus Spike protein, the virus is unable to bind to a host cell. Similar to its antiviral activity against MHV, NBE may reduce viral entry and spread of SARS-CoV-2 by targeting the coronavirus Spike protein.

"The theory that Dr. Das Sarma and her group of collaborators from around the globe are looking at is whether NBE can block the Spike protein from the SARS-Cov-2 virus that causes COVID-19," explained Dr. Shindler.

Dr. Debnath Pal, a collaborator at the Indian Institute of Science, is

Drs. Das Sarma and Shindler worked with a number of collaborators on the NBE study, as shown below:



using an in silico approach to investigate which compounds in the NBE bind most effectively to the Spike protein.

"It's a big protein, so we want to see the minimum that is required to mitigate the pathogenicity of the virus," Dr. Das Sarma said. Additional collaborators at University of Colorado, University of Florida, and Emory University are examining the ability of NBE to block viral entry into a variety of different cell types.

Dr. Das Sarma's group is also creating a recombinant murine coronavirus containing the Spike gene from SARS-CoV-2. With this recombinant virus, her team can use murine models to study the effect of NBE on viral spread and pathogenicity of SARS-CoV-2.

Dr. Shindler's lab has shown that the murine coronavirus MHV causes optic neuritis, or inflammation of the optic nerve. The ability of this virus to move up and down the optic nerve, as well as the isolated nature of the optic nerve, provides an excellent model for evaluating the role of the Spike protein in viral spread. Dr. Shindler plans to use the recombinant murine coronavirus to investigate the effect of COVID-19 on the optic nerve, as well as the potential for NBE to prevent damage to the optic nerve.

Although Dr. Das Sarma's team is making tremendous progress, the COVID-19 pandemic has presented challenges in carrying out this research. For example, shipping physical materials and reagents between labs all over the world, which was a complicated process before the pandemic, has become even more difficult. International travel is also much more restricted, which poses limitations on researchers, trainees, and students who are involved in the research. Moreover, the use of a high-biosafety level (BSL) facility is often required to conduct research on viruses. Although a BSL-3 facility is available to collaborators at UPenn, use of the facility is in very high demand due to the increasing volume of studies on SARS-CoV-2.

However, videoconferencing has allowed collaborators to stay in contact, share data, and continue the investigation. "One good thing is that these online platforms are helping us a lot. We can still keep our work going. At least we have the opportunity to meet with people overseas without any barriers," said Dr. Das Sarma.

Studying the therapeutic benefit of NBE with respect to the novel coronavirus has several potential exciting outcomes. One is that NBE may offer a treatment for not only the SARS-CoV-2 virus, but also other types of coronaviruses that may lead to outbreaks in the future. In addition, Dr. Das Sarma's team is learning much about the antiviral activities of neem, which may lead to future studies and therapeutic applications beyond the immediate need to treat COVID-19.

"It's also exciting to just work in the network that Dr. Das Sarma has put together to show how this work in virology can advance science and get people to collaborate across different fields," said Dr. Shindler. "For me, it's exciting to have ophthalmology play a small role in something so broad, involving multiple systems in the body."

Dr. Das Sarma and Dr. Shindler are currently coordinating on plans to test the effect of NBE on the pathogenicity of the recombinant murine coronavirus in summer 2021.

References:
Sarkar L, Putchala RK, Safiriyu AA, Das Sarma J. *Azadirachta indica* A. Juss ameliorates mouse hepatitis virus-induced neuroinflammatory demyelination by modulating cell-to-cell fusion in an experimental animal model of multiple sclerosis. Frontiers in Cellular Neuroscience. 2020;14:116.

How Well Do You Know Your Scheie and Ophthalmology History?

short answer

1. Which member of the royal family did Dr. Harold G. Scheie treat?

2. An oil painting by Thomas Eakins was commissioned in 1889 to honor the retirement of an anatomist and surgeon from UPenn, known for his skill in eye surgery. This famous painting depicts a public surgery in a medical amphitheater. What is the name of this painting?

3. Where was the first American ophthalmic hospital established?

4. Who was the first Chairman of the Ophthalmology Department at UPenn?

5. In what year was the first female resident appointed to the Scheie Eye Institute?

6. In what century was the first wearable pair of eyeglasses invented?

7. Who was the first and only ophthalmologist to be named President of the American Medical Association?

8. What country published the first-ever journal focused on ophthalmology?

true or false

1. In the 1700s, optical glassmaking was very secretive and typically passed down from father to son.

2. The Ophthalmology Residency Matching Program was established in 1960.

3. In the early- to mid-1800s, several well-known eye surgeons reported digging up bodies from graves in order to obtain cadavers for dissections.

4. The very first residency program at UPenn was introduced by the Ophthalmology Department.

5. In the early 1800s, medical residents often served for several years in local hospitals and were well-paid for that time.

6. In the early 1800s, some patients had their eyes “trained” in the days prior to ophthalmic surgery, which involved putting a knife daily into the patient’s cornea.

7. To date, the Department of Ophthalmology at UPenn has had seven chairmen.

Created by Alexandra Brodin, Kristen Mulvihill, and Rebecca Salowe

COVID-19 recovery at a glance

The Scheie Eye Institute is seeing all patients in person and is fully operating at pre-pandemic patient volumes. Telemedicine appointments are still available in certain cases (check with your ophthalmologist).

Weekly Grand Rounds continue to be held in a virtual setting with CME credit available to all attendees.

National Eye Institute, industry, foundation, and philanthropic funding for vision research remains strong. Several of our physician-scientists are conducting research on COVID-19. Read more in the article, "Neem Bark Extract Has Potential to Treat COVID-19."

Our visitor policy now allows 1 person to accompany patients to their appointments. Optical shop visits remain available by appointment only; please call 215.662.8029 to schedule a visit to the Scheie Eye Institute optical shop. Masks are still required for patients, visitors, and staff at all times.

Last updated on 05/25/2021

Penn Medicine

short answer

1. Lord Louis Mountbatten (a cousin of Queen Elizabeth II), who was struck in the eye by a bamboo branch in Southeast Asia during WWII. Lord Mountbatten later led the ceremonies for the dedication of the Scheie Eye Institute in 1972.
2. The Agnew Clinic. This painting, which features David Hayes Agnew, is famous for its scientific realism.
3. New London, CT. The ophthalmic hospital was established in 1917 by Dr. Elisha North.
4. William Fisher Norris (1839-1901). Dr. Norris also helped to establish the first Hospital of the University of Pennsylvania, which was the first University teaching hospital in the United States.
5. 1960. The resident was appointed by Dr. Harold Scheie.
6. 13th century in Italy.
7. Dr. George E. de Schweinitz, second Chairman of the Department.
8. Germany. *Ophthalmologische Bibliothek*, published in 1801, was the first ophthalmic journal published in any language.

true or false

1. True. The few self-taught "oculists" were often viewed with contempt and aversion. Spectacles were sold by peddlers.
2. False. The Ophthalmology Residency Matching Program was established in 1977.
3. True. At that time, there was great difficulty obtaining cadavers for dissections.
4. True. The program began in 1937.
5. False. The length of early residencies typically ranged from six to twelve months, and residents were expected to pay for the privilege of serving in a hospital.
6. True. "Tapping the cornea" was thought to prepare the eye for surgery.
7. False. Dr. Joan O'Brien was the eighth Chairman appointed to the Department of Ophthalmology.

VIRTUAL REALITY

May Provide New Method of Assessing Functional Vision of Patients with Inherited Retinal Degenerations

By Alexandra Brodin

Investigators at the University of Pennsylvania (UPenn) Department of Ophthalmology have shown that virtual reality (VR) technology may offer an effective method of assessing functional vision in children and adults with inherited retinal diseases.

Functional vision refers to a patient's use of vision to perceive his or her environment and has traditionally been assessed using a physical orientation and mobility (O&M) protocol. An O&M protocol evaluates the patient's ability to comprehend his or her own position relative to the immediate environment and to navigate this space safely without aid.

Dr. Tomas Aleman, Associate Professor of Ophthalmology, Dr. Jean Bennett, F.M. Kirby Professor of Ophthalmology and Co-Director of the Center for Advanced Retinal and Ocular Therapeutics (CAROT), and collaborators, including Alex Miller at the UPenn Neurology Virtual Reality (VR) Laboratory, recently investigated a new type of O&M protocol. Their study, published in *Clinical Ophthalmology,* provides proof-of-concept data that using a VR O&M test is a safe and effective way to assess and quantify functional vision. The population for this study included both control subjects with normal vision and patients with *RPE65*-associated retinal disease, including patients who had been treated with gene therapy.

PHYSICAL VERSUS VR COURSES

Physical O&M courses were used in clinical trials of Luxturna, the first FDA-approved gene therapy for an inherited disease. Luxturna was developed by Dr. Bennett, Dr. Albert Maguire, Professor of Ophthalmology, and Dr. Katherine High, Emeritus Professor of Pediatrics at the Perelman School of Medicine and President and Chief Scientific Officer at Spark Therapeutics, among other collaborators. This gene therapy treats *RPE65*-related Leber's congenital amaurosis (LCA), a group of blinding childhood retinal diseases. In O&M courses used for the Luxturna trials, study participants followed arrows to reach a door that marked the end of the course under different levels of illuminance, avoiding obstacles along the way. Illuminance refers to the amount of light hitting an object or surface.

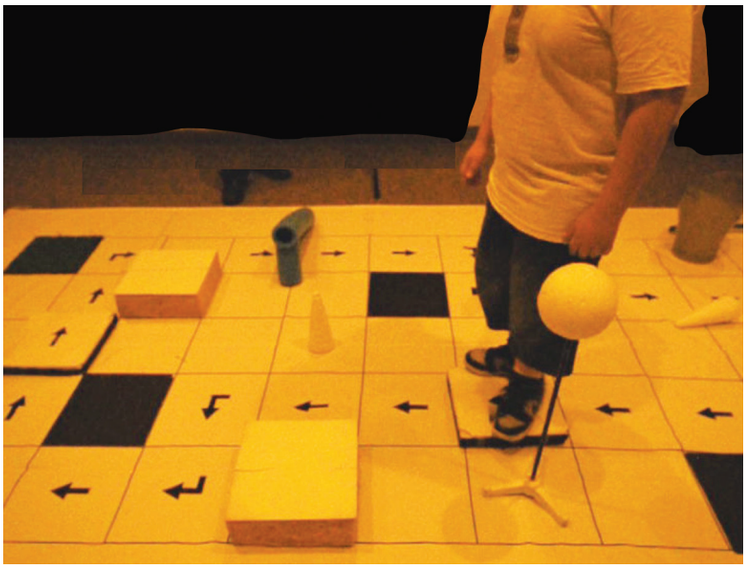
With VR mobility tests, study participants used goggles containing a head tracker, hand trackers held at waist level, and foot trackers to complete a virtual course similar to the one described above, including arrows to follow and obstacles to avoid. Prior to the official tests, participants were given time to practice and become familiar with the VR equipment. Investigators purposely kept the visual scenery simple to avoid complicating interpretation of results. Objects appearing in the VR course were achromatic and set against a dark background.

The virtual tests took place in two steps. The first step consisted of an orientation task, in which participants were evaluated on their ability to follow a path of red arrows. A luminance of the arrows was identified at which the participant was able to complete the course. Luminance, in contrast to illuminance, refers to the intensity of the light emitted from a surface. The layout of the course was changed between each attempt so participants could not memorize the path.

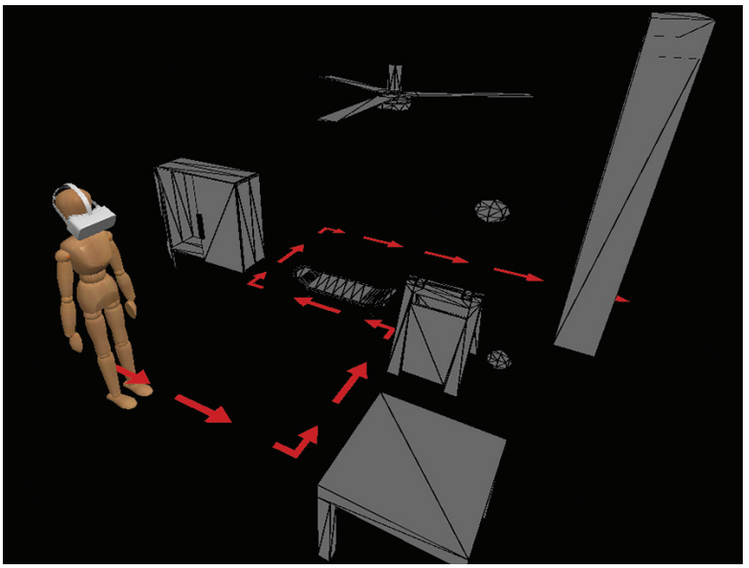
In the second step, participants were again instructed to follow the arrows, but obstacles such as boxes, spheres, and hanging signs were added to test the ability of the participants to use their vision to avoid collisions. Similar to the first step, the luminance of the objects was increased until patients could effectively avoid them without compromising speed and accuracy.

The investigators monitored each participant's progress from a desktop computer. Successful course completion depended on speed and accuracy, which the VR software was able to record automatically during the tests.

Accuracy was based on whether the participant stepped on each arrow as instructed. Errors included placing both feet outside the path, going off course, and colliding with obstacles. The investigators used the multi-luminance mobility test (MLMT) grading system to assign penalties for these errors. Dr. Bennett collaborated with vision scientists from Children's Hospital of Philadelphia to develop the MLMT grading system, which was then validated under sponsorship of Spark Therapeutics and published in 2018.



A patient completing a physical orientation and mobility course.



A virtual reality orientation and mobility course.

VALUE OF VR

The use of VR courses is not only safe and effective, but may also overcome several of the challenges associated with physical O&M courses. Among these challenges is a limited capacity for evaluating a wide range of vision loss severity. With VR courses, investigators may be able to assess a broader spectrum of disease severity because of their ability to limit complexity of visual stimuli and precisely adjust visual cues within the simulation.

"In future studies we can tailor the test to each individual retinal disease in order to both diagnose the condition and to monitor effects of treatment," said Dr. Aleman. "For example, for Stargardt disease, an inherited macular degeneration, we can add chromatic stimuli and tasks that require a higher level of visual discrimination than required in the current test."

Physical O&M courses also require investigators to spend significant time and resources to ensure that the space is prepared with proper course set-up and homogenous lighting, among other requirements. Adjusting the physical layout between tests to inhibit memorization is also time-consuming. VR O&M courses offer features that serve to overcome many of these challenges, including the automatized detection and recording of a participant's test performance, the lack of need for a specialized physical space, and the capacity for quick randomization of courses as well as modification of objects. In addition, the use of virtual obstacles eliminates the patient's risk of tripping and falling on real objects in the course.

"Use of the VR O&M courses allows us to carry out 20 times as many tests in an hour as we'd be able to do with the physical test. Further, at the end of the testing, we have a score," explained Dr. Bennett. "We don't have to rely on graders to score the results, a process which also risks revealing personal identifiers. Plus, the participants really enjoy the test!"

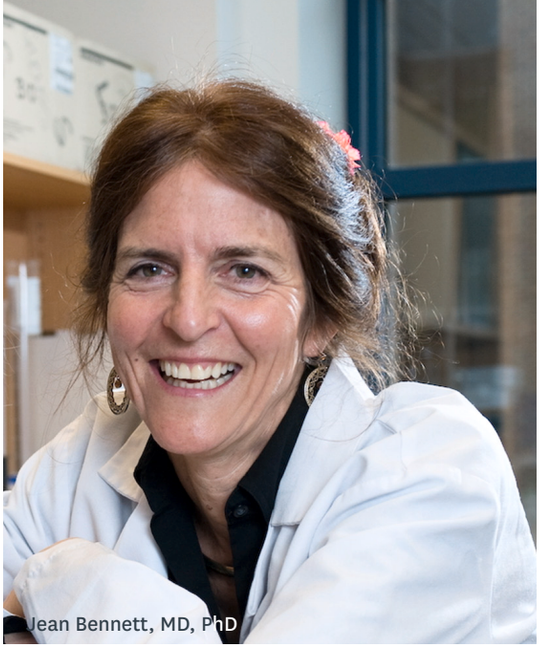
Another benefit of virtual testing is that the subject cannot progress through the course using echolocation, which involves the use of sound and touch to move through a space in the absence of visual stimuli. Many people with low vision are able to develop this helpful navigational skill. In physical O&M courses, however, a patient's use of echolocation can introduce confounding variables in evaluations of his or her functional vision.

As investigators anticipated, all control subjects in this study were able to successfully complete the VR O&M courses. Many patients with *RPE65*-associated retinal disease were also able to complete the courses, though required greater levels of arrow illuminance and object luminance, had approximately twice as many accuracy errors, and took at least twice as much time. As in clinical trials of Luxturna, the patients who received gene therapy were able to quickly and accurately navigate VR O&M courses after treatment.

These results indicate that VR O&M tests are worthwhile to explore as potential endpoints for functional vision in sighted participants, as well as patients with inherited retinal diseases. Future studies on VR O&M tests may serve to validate the protocol Drs. Aleman, Bennett, and collaborators have developed and may incorporate these tests in clinical trials to evaluate effects of experimental treatments. ■

References:
Aleman TS, Miller AJ, Maguire KH, Aleman EM, Serrano LW, O'Connor KB, Bedoukian EC, Leroy BP, Maguire AM, Bennett J. A virtual reality orientation and mobility test for inherited retinal degenerations: Testing a proof-of-concept after gene therapy. Clinical Ophthalmology. 2021;15:939-952.


Mina Massaro, MD


Jean Bennett, MD, PhD


Ranjoo Prasad, OD with low vision technology.

SCHEIE EYE INSTITUTE

hosts virtual series of educational events

By Alexandra Brodin

This year, the Scheie Eye Institute kicked off a virtual event series featuring educational presentations by physician-scientists from the University of Pennsylvania (UPenn) Department of Ophthalmology. This event series was spearheaded by Dr. Charles Nichols, Vice Chairman for Philanthropy and Development at Scheie and Chief of Ophthalmology at the Perelman Center for Advanced Medicine (PCAM).

The Department plans to continue to host these events leading up to the 50th Anniversary of the Scheie Eye Institute in 2022 and the 150th Anniversary of the Department of Ophthalmology in 2024. The purpose of these events is to share cutting-edge research and eye care information with patients and friends of the Scheie Eye Institute, as well as to expand awareness of all that Scheie clinician-scientists are doing to promote vision health.

"With the anniversaries approaching, it is Dr. Joan O'Brien's and my hope that these events will invigorate viewers' interest in the activities and research advances taking place at the Scheie Eye Institute," said Dr. Nichols. Dr. O'Brien, Chairman of the Department of Ophthalmology, gives a brief welcome address at the start of each event.

The first of these events, titled 'Dry Eye in a Virtual World,' was given on February 3 to an audience of more than 100 attendees. Dr. Mina Massaro-Giordano, Co-Director of the Penn Dry Eye and Ocular Surface Center and leading expert on dry eye disease (DED), provided tips and answered questions about managing DED. Dr. Massaro focused specifically on DED management during the COVID-19 pandemic. For many, the pandemic has led to an increase in time spent looking at screens, which can exacerbate DED symptoms. She also reviewed several exciting treatment options for DED and discussed the use of telemedicine to diagnose and treat this disease during the pandemic.

Dr. Jean Bennett, Co-Director of the Center for Advanced Retinal and Ocular Therapeutics (CAROT) at UPenn, presented her talk 'Reversing Blindness Through Gene Therapy' on March 31. In collaboration with Dr. Albert Maguire, among others, Dr. Bennett is internationally known for leading the development of Luxturna, the first-ever FDA-approved gene therapy for an inherited disease. Children and adults who are blind from *RPE65*-associated Leber's congenital amaurosis, an inherited retinal degenerative disease, can have their vision restored with a one-time injection of healthy genetic material into the retina.

In her presentation, Dr. Bennett discussed breakthroughs in retinal gene therapy and answered questions about potential therapies for other ocular diseases, including age-related macular degeneration (AMD). The Scheie Eye Institute plans to invite other guest speakers from CAROT to participate in these virtual events, including Dr. Katherine Uyhazi, who joined the Scheie faculty in January 2021. Dr. Uyhazi's research on cellular therapies shows tremendous promise for developing novel treatments for inherited blindness.

The most recent event took place on May 12 and was titled 'The Evolution of Protective Eyewear.' This event featured guest speakers Dr. Ranjoo Prasad, low vision specialist and the Director of the Penn Center for Low Vision Rehabilitation, and Dirk Breiding, J.J. Medveckis Associate Curator of Arms and Armor at the Philadelphia Museum of Art. Mr. Breiding gave a fascinating overview of eye protection throughout history, starting with armor used in the Middle Ages. Dr. Prasad followed with information on present-day recommendations for keeping the eyes safe, especially during outdoor activities such as camping and sports, as well as home improvement projects.

Dr. Nichols is currently working with the UPenn Development team to plan the next event in fall 2021. ■

If you are interested in receiving information about future events, please contact Paige O'Malley at **pomalley@upenn.edu.**

IN LOVING MEMORY OF JANE PORTNOY, MD

By Rebecca Salowe

The Scheie Eye Institute mourns the loss of Dr. Jane Portnoy, a treasured member of the UPenn Department of Ophthalmology for the past 20 years. Dr. Portnoy died on March 28, 2021.

Among her many accomplishments, Dr. Portnoy was the first woman board-certified ophthalmologist in the Commonwealth of Kentucky. She was a brilliant diagnostician and a true healer, who was passionate about serving others in all aspects of her life. She treated all of her patients and colleagues with selflessness and compassion. She leaves behind a beautiful legacy of altruism and courage, which will be an inspiration for generations to come.

To honor the legacy of Dr. Portnoy, the Scheie Eye Institute will sponsor an award to the graduating medical student who best represents her humanitarian values and exemplary life.

Below, faculty, staff, and alumni share their memories of Dr. Portnoy.

"She was very personable, always willing to go out of her comfort zone and the go-to neuro-ophthalmologist at Radnor. I loved her enthusiasm and her pupil lecture she would give the residents every year!"

— Madhura Tamhankar, MD

"I am lead Ophthalmic tech at the Radnor location and supported Dr. Portnoy in her clinic here since she arrived in August of 2000. On day one, she began giving all of us at Radnor her trust and appreciation of our work. After many more difficult days she would always let us know that she 'couldn't have done this day without all of you.' Dr. Portnoy always conveyed that we work together and we lunch together. The humility she displayed made any day a pleasure.

Dr. Portnoy was more than an amazing physician. She was a constant source of all of the qualities one looks for in a friend. She would put her patient's mind at ease from start to finish.

I will miss Dr. Portnoy, but I will keep her with me as a gift and use this with each and every patient I assist moving forward. We are all so fortunate to have had Dr. 'P' in our lives."

— Cathy Lawn

"I first met Jane in 1995 as a medical student and can attest to her skill, compassion, and quiet generosity. She will be missed but this award will allow her memory and dedication to live on."

— Scott Goldstein, MD

"Dr. Portnoy was not only a 'brilliant diagnostician and true healer,' but she was a great teacher as well. She taught me many valuable lessons during residency which I still carry forward to this day. She treated everyone with dignity and respect and had a true calming effect on her patients. She will be sorely missed and my prayers go out to her family. I am so glad that this award will allow her legacy to live on."

— Robert Stoltz, MD

"I had the pleasure of working with Dr. Portnoy for 12 years. She was always kind, pleasant, humble, and caring. She stood for fair treatment of all, including middle level personnel. She loved her staff and patients and we loved her. She was a fantastic baker. I even suggested to her, on more than one occasion, to stop being a doctor and open a bakery. She would just smile. I will truly miss her, my heart is broken. RIP Dr. Portnoy!"

— Donna Kirkland

Dr. Portnoy (center) and colleagues at the Scheie Anniversary Weekend in 2019.

Dr. Portnoy with two patients at the Mercy Fitzgerald Hospital.

"I am deeply saddened by the passing of Dr. Jane Portnoy. By far, I have not spent as much time with Jane as many of you have. However, the times I did share with her are filled with kindness and grace. She was the person who taught me the pupil during my OP200 rotation; the person to guide me through my first and only ECCE during residency; and the first person I saw on my first day on faculty. Throughout these years, we have had many conversations about our families and our lives. She was an amazing listener; possessed a fierce love for her family and community; and was so humble. When I had heard she had written a cookbook, I was utterly surprised and probably pestered her way too much with my questions about it. Jane will forever be a part of my life and I will sorely miss her and our conversations."

— Vivian Lee, MD

"Jane was an expert and giving physician. Her patients were devoted to her because she listened and truly cared for them. The same was true for her colleagues and friends. Jane lit up the room with her smile, and she focused always on others and never on herself. Jane was in every sense a healer."

— Joan O'Brien, MD

"I have fond memories of talking with Jane in between patients at the VA about our latest cooking and baking adventures. She brought over chocolate chip cookies when we first moved into our home and my daughter still talks about them. I will surely miss her kind and warm heart."

— Nirali Bhatt, MD

"I worked with Dr. Portnoy at the Mercy Fitzgerald office for a number of years. She had such varied interests, and it was not unusual for her to bake some treat and bring it in to share with the office staff. She spoke French with patients whose native language it was. She shared memories from her travels and experiences, and brought a cheerful spirit to the office. We all, patients and staff alike, feel her loss."

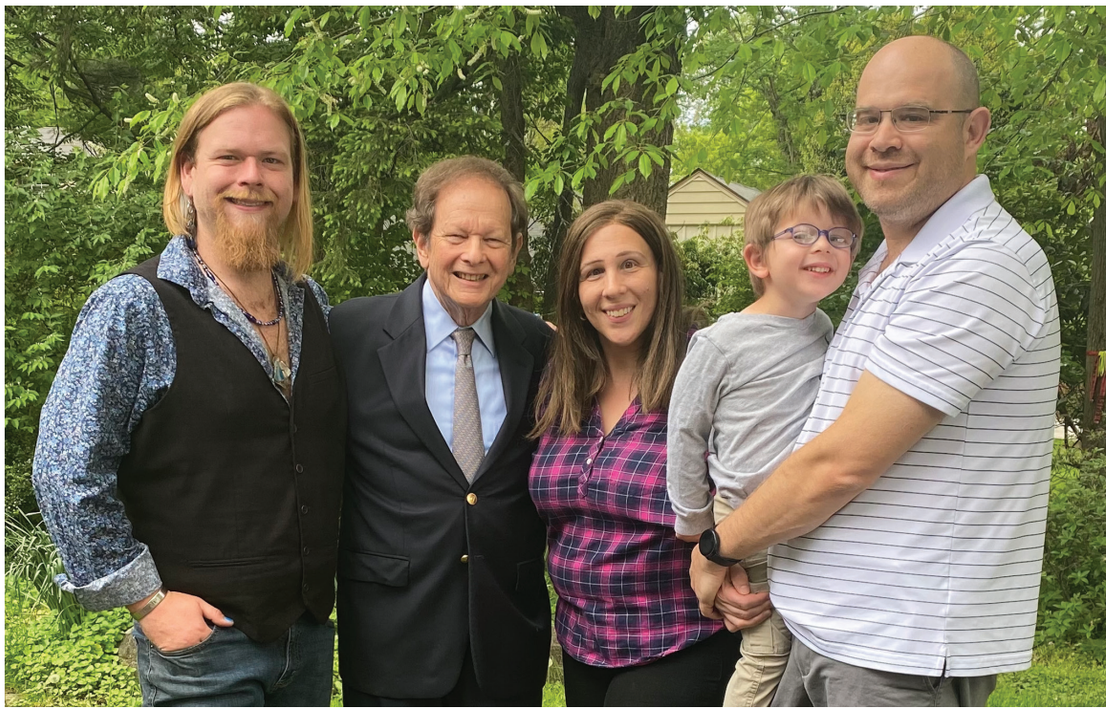
— Gaby Ortiz

"Jane was such a wonderful person. She and I were the helms of Penn eye care at Mercy Fitzgerald for almost two decades. This is how I got to know her well. She is such a kind person with so many outstanding qualities and she brought all these fine qualities when she came to work. Her patients really loved her, not only for the medical experience, but also for her care. Although I am sad about her passing, her legacy and her influence will live on. I am happy for that."

— Prithvi Sankar, MD

"Jane was an amazing colleague and friend, and a gifted ophthalmologist. Her compassion for her patients was unsurpassed. She had a true love for ophthalmology. I remember the amazing

Dr. Portnoy dancing at the Scheie Anniversary Weekend at the Rittenhouse Hotel in 2019.



Dr. Portnoy's loving family, including (left to right) Michael Portnoy, Marshall Portnoy, Julie Beth Portnoy Simon, Jordan Simon, and Alex Simon.

talk she gave on the history of ophthalmology that she researched using original documents from the Historical Medical Library at College of Physicians of Philadelphia. I loved to hear about Jane's family, her travels, her view of life. When she spoke of France, I felt like I was actually there. She even tried to civilize me by taking me to the opera (my first time!). Jane, you made life better for all of us. I miss you."

— Eydie Miller-Ellis, MD

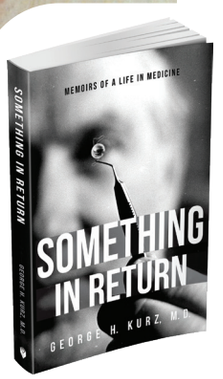
"I have known Dr. Portnoy for 20 years, first with the privilege of learning from her as a resident trainee, and then as a faculty colleague for the last 16 years. Our schedules overlapped almost every Thursday afternoon working at the VA eye clinic. Dr. Portnoy was a dedicated and compassionate physician and outstanding colleague, always willing to offer advice and assistance. In addition to her busy comprehensive ophthalmology practice, she had completed subspecialty training in neuro-ophthalmology and was an active member of the North American Neuro-Ophthalmology Society for as long as I have known her. I will always remember and be grateful for Dr. Portnoy stepping in and helping me on occasion when I was out of town and there were acute neuro-ophthalmology patients that needed attention at the VA.

Beyond our work together, Dr. Portnoy was a very caring friend who took a sincere interest in people's lives. We discovered years ago that her mother and my parents lived in the same community in Florida, and from that moment on she never missed an opportunity to inquire about my parents and share stories of her own mother. Dr. Portnoy also generously helped my family and me make arrangements to attend holiday services on several occasions when we had nowhere else to go. I will miss her caring and thoughtful discussions about our families and her unwavering dedication to her patients."

— Ken Shindler, MD, PhD

"Dr. Portnoy had such a kind soul, she respected and appreciated the staff who worked with her and would express that frequently. I feel fortunate to have her cookbook which she personalized for me. I have made many of her delicious recipes, the Jewish apple cake is superb! Dr. Portnoy will remain in my heart as one of the nicest and most gracious doctors who I worked with in my 30 years of working in Ophthalmology."

— Jeanne Nemetz



Dr. Kurz working on a Habitat for Humanity house in Lambertville, New Jersey in winter 2002.

Alumni Spotlight

George H. Kurz, MD

By Kristen Mulvihill

Born and raised in Philadelphia, George H. Kurz, MD was the first in his family to pursue a career in medicine. Now retired, Dr. Kurz led an impressive and fulfilling 40-year career, some of which took place at the University of Pennsylvania (UPenn). To commemorate these years, he recently published a book titled *Something in Return: Memoirs of a Life in Medicine*.

Dr. Kurz received his undergraduate and medical degrees at UPenn. He then completed a rotating internship and his ophthalmology residency at the Hospital of the University of Pennsylvania, 12 years prior to the opening of the Scheie Eye Institute. He pursued a fellowship in ophthalmic pathology at the Armed Forces Institute of Pathology under the mentorship of Lorenz E. Zimmerman, MD.

From 1963 to 1994, Dr. Kurz practiced general ophthalmology at Hunterdon Medical Center (HMC) in Flemington, New Jersey. Initially, all HMC specialists were required to spend one day per week at New York University (NYU) Medical Center. At NYU, Dr. Kurz taught residents and conducted research in the ophthalmic pathology laboratory. He also worked as a consultant in pathology at Wills Eye Hospital one day per week from 1978 to 1985. In addition, he taught family practice residents at HMC and medical students at Robert Wood Johnson Medical School, where he served as Clinical Professor of Ophthalmology at the time of his retirement in 1994.

"Teaching remained a favorite part of my life in ophthalmology," Dr. Kurz explained.

Following his retirement, Dr. Kurz developed interests in teaching English as a second language, constructing houses with Habitat for Humanity, and collecting bicycles to ship to developing countries. Having published a book in 1987 about his father's memoirs, he began compiling his own stories and writing *Something in Return: Memoirs of a Life in Medicine*, which was published in 2020.

"At the 50th reunion of our UPenn medical school class, more than 50 of us made speeches, thankfully brief, recounting exciting or unexpected events in our careers," Dr. Kurz said. "In my own medical career, so many events stood out in my memory that I set out to write about them when I connected with a creative writing group shortly after retirement."

Stuart L. Fine, MD, seventh Chairman of the Ophthalmology Department, wrote a foreword for the book, which recounts Dr. Kurz's experiences in the field of ophthalmology.

"My book is filled with many notable events, some inspiring, many humorous, and a few heartbreaking," Dr. Kurz said.

Dr. Kurz and his late wife Elisabeth, a Certified Ophthalmic Technician, also traveled abroad to teach and provide patient care, visiting China, Ecuador, the Philippines, and Africa. Assisting Tanzanian ophthalmologist Dr. George Msella, Dr. Kurz participated in the first intraocular lens implantation in Tanzania, which he shares in his book.

The day after the procedure, the patient sat up in bed and graciously thanked Dr. Kurz. "When I couldn't understand the Swahili that followed, a nurse explained, 'He's asking God's blessing for you. He is so happy he can see!'" he recalled. "I walked back downstairs with tears welling up in my eyes, overwhelmed with a feeling of what a privilege I had had."

Through the years, Dr. Kurz maintained a strong relationship with Scheie. He served as a visiting instructor and presented an annual series of lectures in pathology for a graduate course in ophthalmology.

"My favorite part of my connection with the Scheie Eye Institute became the annual alumni meetings, at which I often presented papers," he said. "In 2010, Dr. Fine invited me to give the Honored Alumnus Lecture at the 136th Anniversary of the Ophthalmology Department."

Dr. Kurz currently resides in Bucks County, Pennsylvania. Over the years, he has enjoyed bicycling, tennis, sailing, and waterskiing, and teaching these to his five children and seven grandchildren. He also sang in his church choir and held leadership positions in church committees and nonprofit organizations. ■

alumni president

dear friends

Scott M. Goldstein, MD
Pediatrics & Adult
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Tri-County Eye & Wills Eye Institute

Each and every one of us can look back at our time in medical school, residency, and possibly even fellowship to recall the hard work we put into mastering basic sciences, pathophysiology of disease, and clinical care so that we could take this knowledge forward to help our patients. It is clear to me that our short time at the Scheie Eye Institute fused the amalgamation of science and skill in all of us such that we have been able to navigate the world of ophthalmology with deft precision and skill.

Our exposure to cutting-edge research with a keen understanding of the importance of clinical trials and top-notch surgical training have served us well. However, despite the rigors of science and skills polished within the hallowed halls of our alma mater that have set us up for long-term success, there is one facet within medicine that I feel is often overlooked: advocacy.

Despite our strong inclinations to be scientists and surgeons, the legislative and business worlds dictate what we are allowed to do and how we practice medicine on a day-to-day basis. Individual state legislative bodies define scope of practice, with or without our involvement. Insurance companies can mandate which medications we should prescribe in the hopes of regulating costs, and set the rates we are paid for doing the heavy lifting of patient care.

A closer look at the rich legacy of those that came before us highlights the importance of being engaged in the advocacy process of organized medicine. Dr. de Schweinitz served as President of the American Medical Association in the 1920s. Dr. Adler, who established the first formal residency training program at Penn, was integral in running the American Board of Ophthalmology to ensure appropriate training of ophthalmologists and the safety of patients' eyesight. Drs. Scheie and Frayer both served terms as President of the Pennsylvania Academy of Otolaryngology and Ophthalmology, leading efforts of advocacy and education across the state.

In more recent years, Scheie graduates like Steve Thornquist in Connecticut, Kate Lane in Vermont, and Carolyn Glazer Hockstein in Delaware have all served as presidents of their state ophthalmology societies. Others have served as leaders in their specialty societies and the American Academy of Ophthalmology. These days, there are fights over preauthorization of testing and surgery. In more states than ever, there is a push to have non-physician health professionals expand their scope of practice without extensive training. An ophthalmology resident has about 17,000 hours of hands-on clinical and surgical training before graduating, while an optometry student has about 1,900 hours focused mainly on primary care and refracting. Yet Wyoming just passed a bill allowing optometrists to perform some surgical and laser procedures. This puts the safety of patients and their eyes at risk. For example, I am a fully licensed physician who saw a few appendectomies in medical school, but that doesn't really qualify me to perform that surgery. Healthcare providers must prove and maintain competency to perform the delicate procedures we as ophthalmologists have mastered.

In conclusion, I encourage more of you to get involved. Follow the example of our past leaders. Participate in your local, state, and national eye societies. Give time, donate money, meet your state and federal legislators. It is important to be engaged in the whole practice of medicine and ophthalmology. The health, welfare, and safety of our patients demands it.

Scott M. Goldstein, MD res '00, fel '02
President, Scheie Alumni

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The Scheie Eye Institute is the Department of Ophthalmology at the University of Pennsylvania. Scheie has been a leader in the field of ophthalmic research, education, and patient care for 147 years. Many of our greatest advancements in vision-saving therapy have been made possible by donations from individuals and organizations.

Will you join the Scheie Eye Institute?

For more information contact us at
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Or by email:
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PennMedicine.org/supportscheie