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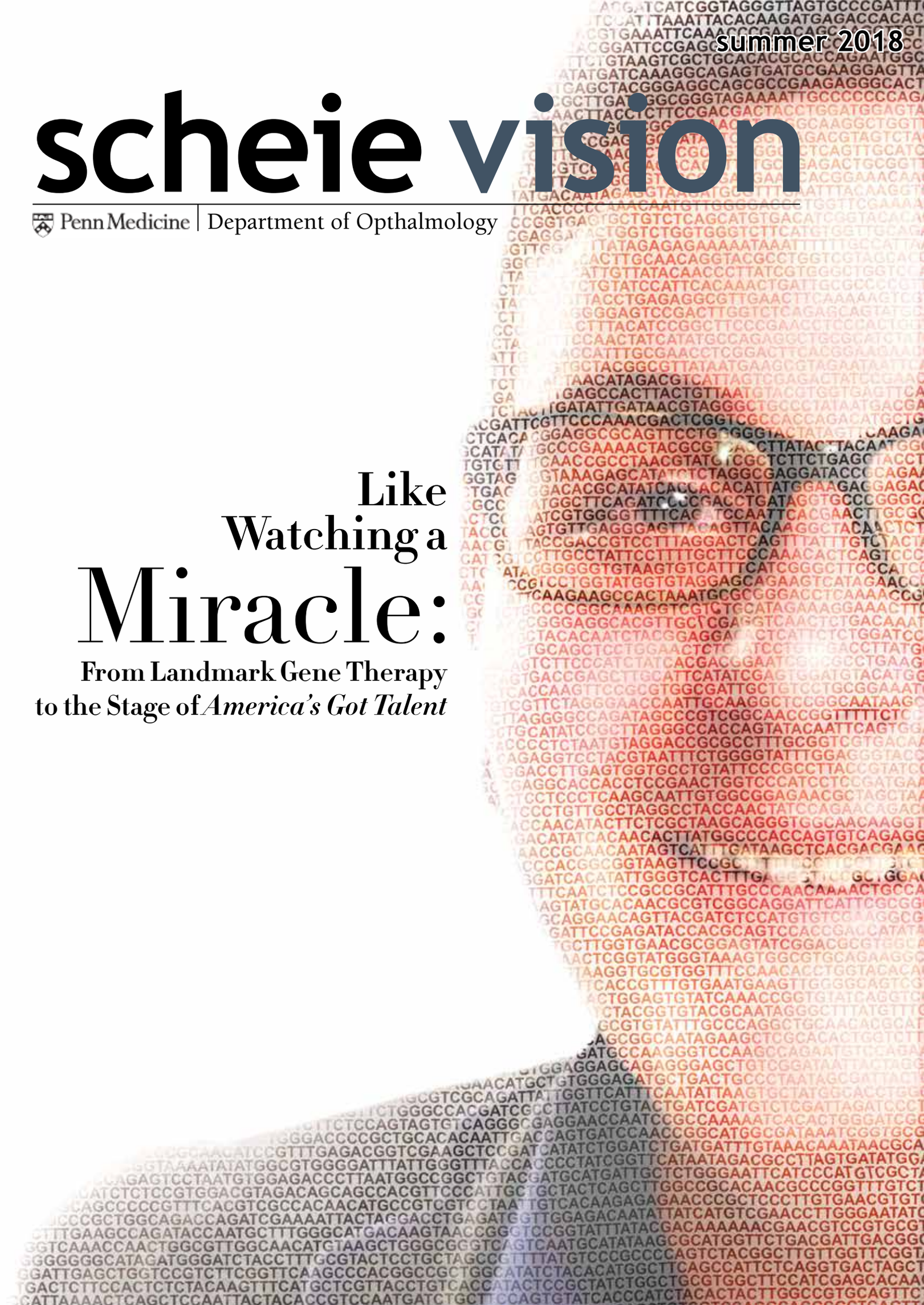
scheie vision

Penn Medicine | Department of Opthalmology



Like Watching a Miracle:

From Landmark Gene Therapy to the Stage of *America's Got Talent*

IN THIS ISSUE

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A MESSAGE FROM THE CHAIR

Dear Friends,

Penn Medicine's Department of Ophthalmology, Scheie Eye Institute, is dedicated to cutting edge research, providing the highest quality of care in Philadelphia and around the world, and training the next generation of ophthalmologists. Our faculty and staff strive to cultivate an environment of continued learning and mentoring, where young minds with great potential grow and thrive. Our alumni go on to lead impactful careers, maintaining relationships with peers and mentors and returning to the Annual Alumni Meeting each spring. This event is always a reminder of the outstanding accomplishments of Scheie's alumni, students, staff, and faculty, and their daily commitment to improving the lives of patients and colleagues.

This issue of *Scheie Vision* covers the people behind Scheie's advances and mission of excellence. We feature Lang Lourng Ung, an ophthalmic technician who brings inspirational resilience and passion to working with patients; Sonul Mehta, MD, who travels around the world to provide ophthalmic care in underserved communities; Jessica Morgan, PhD, whose research on photoreceptor function has tremendous implications for the diagnosis and treatment of retinal disease; and Jean Bennett, MD, PhD, and Al Maguire, MD, who have demonstrated unwavering commitment for over 25 years to making it possible for blind children to see.

This issue also honors the memory of two more remarkable individuals who are no longer with us: Laura Ball, a beloved administrative assistant in the glaucoma service and close friend to many of Scheie's staff and faculty, and Walker Kirby, a generous donor and friend to the Scheie Eye Institute for many years. Laura and Walker touched many lives, including my own, and I will always cherish their memories and countless contributions to this Department.

I would like to express my gratitude for the extraordinary individuals who make Scheie exceptional in all its missions. It is our colleagues, students, and patients who bring true joy and fulfillment to this work, and who make possible the common vision of excellence we all share. I hope you enjoy flipping through these pages and reading their stories.

Wishing you all a happy and healthy summer!

Joan O'Brien, MD

Christian Guardino performs on *America's Got Talent* in 2017, four years after participating in the Phase III clinical trial for gene therapy. Photo credit: Trae Patton/NBC/NBCU Photo Bank/Getty Images.

Like Watching a Miracle

By Ava Kikut

It was a summer evening in 2013. The audience was waiting to hear Christian Guardino sing. The host called his name a first time, and then a second time. But Christian didn't go onstage. He stood still, mesmerized by something he had never seen before—a white ball in the night sky.

"What're you doing buddy?" The host had found Christian backstage.
"I'm looking at the moon," Christian replied.
"You've never seen the moon before?"
"Nope."

When the host returned to the stage with Christian behind him, he explained the delay to the audience. "There wasn't a dry eye in the house," remembered Christian's mother, Beth Guardino.

Christian was diagnosed with Leber's Congenital Amaurosis (LCA), a rare retinal degeneration, as an infant. "They didn't really know what genes were causing

LCA at that point," explained Beth. "We were told that he had the type of LCA that would either slightly improve with age or remain stable."

Christian's limited vision posed a number of challenges as he entered school. He struggled to recognize faces of friends waving at him in the hallway, and he often worried others would think he was antisocial. "I don't think the sighted world really understands the communication issues that happen when you're not fully sighted," said Beth.

In the classroom, despite always sitting in the front row, Christian could not read the writing on the board. "It was really tough for me to see and properly learn," he recalled. Christian was especially sensitive to noise, and found it difficult to concentrate on the teacher's voice when there were other sounds in the room. Teachers did not always understand why he was distracted. "I feel like they would seem to get both annoyed and confused," he said.

Beth made efforts to explain Christian's visual behaviors to teachers at the beginning of each school year, but misunderstandings continued to arise. "I think that was more of a struggle than his peers," she said. "We would continually hear how distracted he was. Christian was such a great student and very respectful, so that was hard for us."

When Christian was eleven, Beth noticed he was having more difficulty than usual recognizing people and objects. Despite having been assured that Christian's vision would remain stable, Beth was certain it was declining. She decided to do more research.

Through a Facebook search, Beth found a support group for LCA patients and families, and she learned about an upcoming conference in Philadelphia. It was at this conference that the Guardinos confirmed they had been misinformed when Christian was first diagnosed. Christian's vision was not only declining; it was likely to deteriorate completely. Without intervention, he would be blind between the ages of 15 and 30.

But there was hope. The Guardinos met Dr. Jean Bennett and learned of a clinical trial for a treatment targeting a specific genetic mutation—*RPE65*. If Christian's LCA was caused by an *RPE65* mutation, he would be eligible for the clinical trial, and his vision could potentially be saved by gene therapy. During the conference, Christian underwent genetic testing.

In March 2013, just before Christian's 13th birthday, the conclusive report came from the lab. Christian did indeed have the *RPE65* mutation, qualifying him for the gene therapy trial. The treatment was scheduled during summer break three months later.

Christian was eager to take part in the trial. "I wanted to stop that inevitable blindness. That was my main goal," he said. But when he woke up from the surgery in June 2013, he realized the procedure did much more for his vision than he had expected. "It was crazy because I already saw results as soon as I woke up from the gene therapy. I remember waking up in a really dark room and I looked over to my left and there was this little lamp light. And one of the tech coordinators there, her name was Dominque, and I said, Dominique is that you? And it was her. And I would never have been able to see in a room that dark."

Just a couple weeks later, Christian found himself performing on an outdoor stage in front of an emotional audience, having just seen the moon for the first time. When he returned to school that fall, Christian could recognize people as they waved at him in the hallway. His experience in the classroom also improved. "I've been able actually to see the whiteboard much better," he said. Christian, who graduated from high school in the spring of 2018, is now taking time to focus on his singing career before going to college for music or film.

While Christian's limited vision never deterred him from singing, the improvements to his sight since the gene therapy have given him more freedom onstage. Beth noted, "Before he would have to be led onstage to perform because it was too difficult for him to see. Now he just walks right out there and does his thing. It's made a huge change in his confidence."

In 2014, Christian became the Grand Prize Champion at the Apollo Theater's "Amateur Night at the Apollo Stars of Tomorrow" category. In 2016, he sang the national anthem at the NY Islanders playoff game. That same year he performed a duet with Jordin Sparks for Michelle Obama's "Fit 2 Celebrate" Gala. And in 2017, Christian stunned the audience and judges of *America's Got Talent*, earning the Golden Buzzer from Howie Mandel. Christian was named Youth National Champion by the Children's Miracle Network Hospitals and a Vision Hero by the Vision of Children Foundation. He is currently working on a project with Grammy nominated songwriter Sacha Skarbek.

"It's been a dream come true," Christian said. Beth added, "To go from thinking your child would never see your face to where we are now…it's literally like watching a miracle. That's exactly what it is."

Photo credit: Peggy Peterson

The Team Making Blind Kids See

SCHEIE PHYSICIANS RECEIVE FDA APPROVAL FOR LUXTURNA, THE FIRST GENE THERAPY FOR AN INHERITED DISEASE

By Rebecca Salowe and Emma Wells

Children born with Leber's Congenital Amaurosis (LCA) are not defined by blindness, but will face obstacles unimaginable to most sighted individuals. With low vision from an early age, these children may be sidelined from regular activities such as sports, bike riding, and trick-or-treating. They may be unable to see the chalkboard in the classroom and be highly sensitive to distracting noises, making it difficult to learn. They will need to memorize fire escape routes, be escorted across the street, explain their condition countless times to teachers and peers, and rely on others to describe surroundings. Children with LCA tend to overcome these challenges with outstanding resilience. Their visual impairment makes them no less intelligent, creative, or talented. What distinguishes a child with LCA from his/her peers is a rare genetic mutation, a microscopic error in the biological blueprint.

Over the past 25 years, a team of scientists has worked to prove that DNA is not as fixed as previously believed—that defects caused by a mutated gene can be overcome by delivery of a normal copy of the gene. Drs. Jean Bennett and Al Maguire have dedicated their careers to the belief that a single genetic mutation should not determine a child's fate. On December 19th, 2017, the world saw the beginning of a new era as this vision was realized. The FDA had officially approved their gene therapy regimen for a form of LCA caused by the *RPE65* mutation. Luxturna, the brand name for this treatment, had just become the first gene therapy for an inherited disease ever approved in the United States.

IT ALL BEGAN IN ANATOMY LAB

Just two decades earlier, gene therapy was a field with few promising results. The idea that normal genes could be used to correct mutations causing genetic disorders was an exciting one, but difficult to implement—and often dangerous.

These setbacks did not deter Dr. Bennett. After completing her PhD in zoology and post-doc in molecular biology, she attended Harvard Medical School to gain expertise in diseases that could potentially be treated in the future with gene therapy. There, she met her now-husband, Dr. Maguire, working over a cadaver in anatomy lab. A partnership that extended beyond marriage and into the world of research was formed.

Dr. Bennett carefully followed the progress of gene therapy during medical school and subsequent fellowships. Meanwhile, Dr. Maguire completed his training to become a retinal surgeon.

Then, in 1990, Dr. William French Anderson conducted the first gene therapy on a human: a four-year-old girl named Ashanti DeSilva, who had adenosine deaminase (ADA) deficiency, a genetic disease leaving her defenseless against infections. The therapy involved treatment of Ashanti's cells in a dish and then return of these treated cells into Ashanti's bloodstream. This "ex vivo" treatment was successful, and led to a partial improvement in Ashanti's condition.

The breakthrough ignited an idea in Dr. Maguire. He asked his wife, "Do you think we could ever develop a gene therapy to cure inherited forms of blindness?" She immediately answered: "Yes, of course."

EARLY FAILURES IN GENE THERAPY

Ever the optimist, Dr. Bennett did not initially mention to Dr. Maguire the long list of ingredients that would be required to design successful gene therapy for retinal degeneration. For example, the genes involved in inherited blindness had not yet been identified. Extrapolation of the approach used in Ashanti's case to treatment of the retina was unlikely to be effective. Viruses were being considered for gene delivery to retinal cells, but none had been shown to do so safely. There were no genetically characterized animal models of retinal disease. The surgical techniques to deliver genes to the retina had not yet been developed. Finally, even if these hurdles were overcome, there were no metrics to evaluate the effect of gene therapy on vision. However, these obstacles did not discourage Drs. Bennett and Maguire.

By the 1990s, Drs. Bennett and Maguire were married and had been recruited to the Scheie Eye Institute at the University of Pennsylvania (UPenn). Their initial gene therapy experiments yielded frustrating results, though they eventually demonstrated a proof-of-concept of gene therapy in a mouse model of retinitis pigmentosa. Meanwhile, faith in gene therapy was crumbling around them. In 1999, an 18-year-old boy named Jesse Gelsinger died in a gene therapy trial (in which they were not involved) at UPenn. All gene therapy trials across the nation were immediately halted.

"There had been a general sense that this was a therapy that was not ready for primetime, that there were too many things we didn't understand," said Katherine High, MD, the then-director of the Center for Molecular Therapeutics at Children's Hospital of Philadelphia (CHOP), in the PBS documentary *Genes as Medicine*. "All the companies that had been involved in gene therapy were either turning away from it or they were failing."

Again, despite the seemingly insurmountable barriers in this field, Drs. Bennett and Maguire persevered. "With the belief that our approaches for treating retinal disease would be safe and effective, we continued to move forward cautiously with our bench research despite the unpopularity of gene therapy," said Dr. Bennett. By 2000, they were ready to test a gene therapy procedure in dogs that were blind from LCA. The treatment delivered a healthy copy of the *RPE65* gene into the retina of dogs using an adeno-associated virus.

Soon after treatment, the dogs were placed in an obstacle course, which they had previously blundered through blindly. Now, the dogs ran through the course safely and quickly. They turned in circles, looking around at the world with the treated eye for the first time. Electroretinograms, carried out by their colleagues at Scheie, confirmed that the photoreceptor response of the dogs was restored.

The story of blind dogs regaining sight was featured in numerous media outlets, including *Good Morning America*, and was presented at the U.S. Congress. "The obvious next thought was, wouldn't it be great to use this approach so that blind children could see?" said Dr. Bennett.

SEEING THE SUN FOR THE FIRST TIME

In 2005, Dr. Katherine High, a gene therapy expert, approached Dr. Bennett with a proposal. "She walked into my office, and I looked up and she said, 'Jean, how would you like to run a clinical trial?' And I was just totally floored," said Dr. Bennett in *Genes as Medicine*. Dr. Bennett agreed without hesitation. "That was the beginning of a whole infusion of energy and enthusiasm and support."

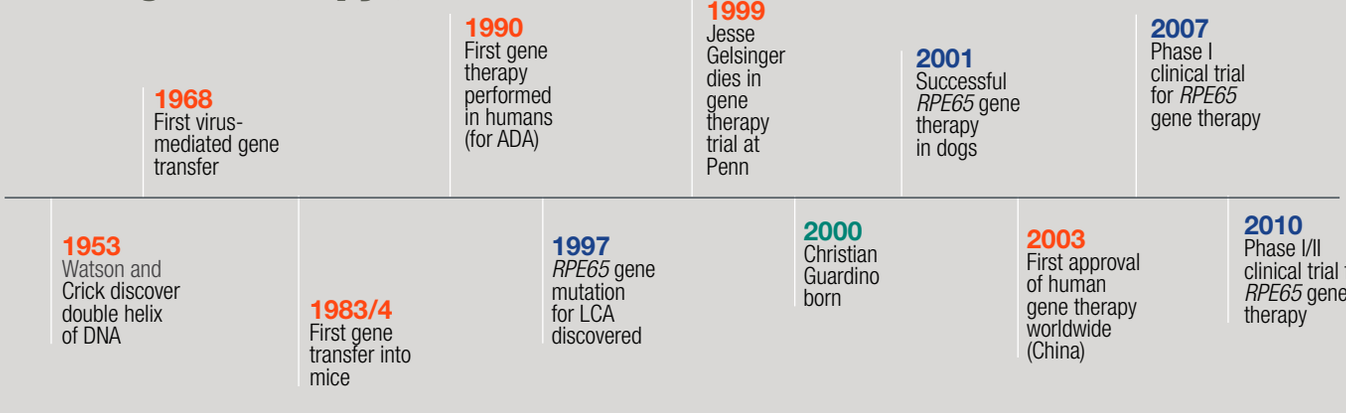
Over the next several years, Dr. Bennett and her team worked relentlessly to prepare for the clinical trial. They created a clinical viral vector, generated a full set of safety and efficacy data, bred animals, designed protocols, defined outcome measures, and purchased equipment. After less than two and a half years of preparation, they enrolled the first subject.

The safety bar for human gene therapy protocols had been heightened following the death of Jesse Gelsinger—and this matter was further complicated by the inclusion of children in the trial, which necessitated a special review by the US Recombinant DNA Advisory Committee. However, when the time came for the first injection, Drs. Bennett and Maguire were fully confident in the safety of the treatment.

"It was a bold step embarking on the first injection," Dr. Bennett recalled. "Although Albert's and my criteria for moving forward were far more stringent than any of the institutional or federal criteria. That was, if our child was affected with this condition, would we allow him/her to participate? Our definitive answer was yes."

The Phase I clinical trial at CHOP, which was conducted simultaneously with two other trials at University College London and University of

a timeline of gene therapy



Florida, enrolled 12 subjects with *RPE65*-related LCA. The subjects received an injection of the viral vector containing the *RPE65* gene into their worse-performing eye, while the other eye acted as a control.

When the bandages over their eyes were removed, patients reported seeing the brightness of the sun for the first time. They commented on the colors of the world. They passed the obstacle course test with ease–a radical change from their difficulty navigating just days earlier. Further testing showed that all subjects had safe and stable improvement in retinal and visual function in the treated eye. Most subjects showed improvement in light sensitivity, navigational ability, activation in the visual cortex, and structure and function of the visual pathways. As predicted, younger participants gained visual abilities closest to normal-sighted individuals.

Drs. Bennett and Maguire were overjoyed. They deeply care for their patients, often referring to them as family. Before and after treatment, Dr. Bennett often visited the patients' homes or watched the kids give music recitals. She and Dr. Maguire waived all financial gain if the therapy proved successful, in order to ensure their ethical standards remained high.

WILL IT LAST?

The next step was readministration of the therapy to the contralateral eye. "The concern was that the initial injection of the virus would serve as a vaccination," explained Dr. Bennett. "Then, when the second eye was treated, an immune response might not only prevent benefit in the second eye, but might also cause damage to the initially injected eye through immune sequelae."

The team returned to the lab, performing readministration in six dogs with *RPE65*-related LCA who had previously received the treatment in one eye, as well as in four normal-sighted monkeys. The bilateral injection was found safe and effective, producing no inflammatory response.

The team cautiously continued with readministration studies in the human clinical trial subjects. The trial was a resounding success: no adverse effects resulted from the vector, and repeat administration led to durable improvements in retinal and visual function. This trial represented the first successful readministration of gene therapy in humans.

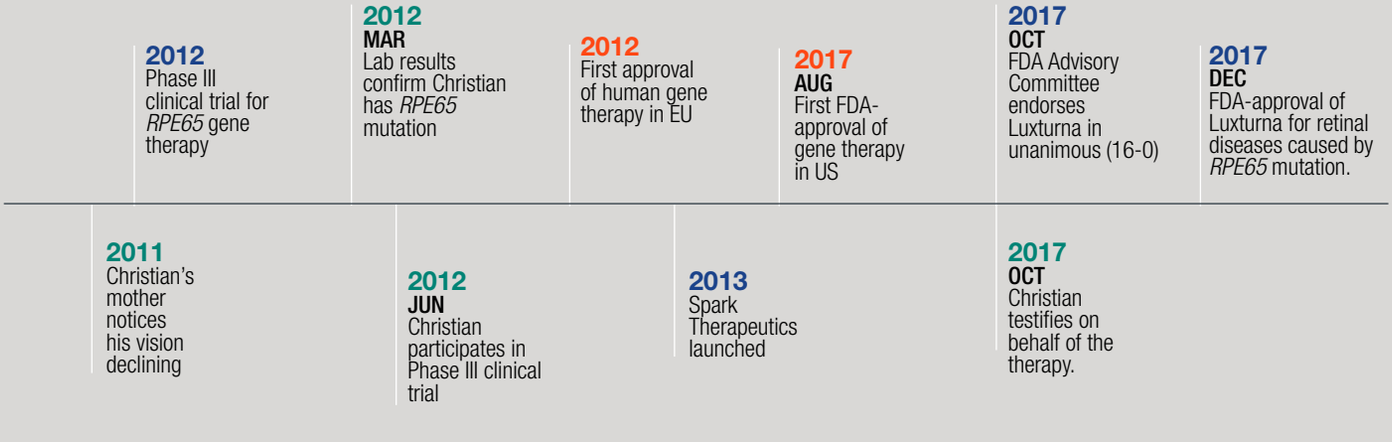
Interestingly, the results also shed light on the tremendous plasticity of the human visual system. It was previously thought that the brain lost its malleability after about three years of age. However, Dr. Manzar Ashtari, Director of CNS Imaging at Penn Ophthalmology, proved in these trials that patients can experience brain restructuring after the critical period of vision development. Before gene therapy, patients' visual pathways were impaired structurally, potentially due to atrophy after long-term visual deprivation. However, after gene therapy, the visual pathways in the treated retina were similar to those of control subjects, suggesting that visual experience can lead to structural changes in the brain.

SCALING UP THE THERAPY

In the following years, Dr. Bennett, Dr. Maguire, and colleagues continued follow-up studies on LCA patients, as well as exploring gene therapy options for other degenerative eye diseases. In 2013, a new gene therapy startup company, Spark Therapeutics, was founded specifically to serve the *RPE65* project. Dr. High became the president of the company. Dr. Bennett and her team worked with Spark to further test the intervention.

The treatment was soon tested in a Phase III clinical trial. This trial enrolled 31 individuals whose *RPE65*-mediated retinal degenerations would otherwise progress to total blindness. (Among these patients was Christian Guardino, whose story is featured on the previous pages.) Patients in the intervention group underwent injection of the viral vector in both eyes. Additional patients were designated as controls and did not receive the reagent for the first year, but were treated in both eyes in the second year. Again, the treatment was a success, leading to stable and durable improvements in retinal and visual function. There were no serious adverse events or immune responses related to the product.

Meanwhile, the idea for a center at UPenn where scientists could continue researching and treating blinding conditions was born. The Center for Advanced Retinal and Ocular Therapeutics (CAROT) was established in 2014, with Drs. Bennett and Maguire as Co-Directors and immunologist Junwei Sun, MS, MBA, as Chief Administrator. Dr. Tomas Aleman was recruited as an expert in retinal degenerative conditions and to run clinical trials. The mission of CAROT is to develop novel therapies for retinal and ocular disorders and to restore sight in visually impaired or blind individuals.



THE FINAL HURDLE

Following the success of the Phase III trial, the final step to making the therapy available to the public was approval from the US Food and Drug Administration (FDA). In October 2017, physicians, researchers, patients, and their parents converged in Silver Spring, Maryland, to testify before an FDA advisory panel during a daylong hearing. The panel would then make a recommendation to the FDA for or against approval.

The day saw emotional testimonies from patients and their families whose lives were transformed by the treatment.

"I just want you to know that this was significant to me, significant in the way that I can plan and live my life," said Caitlin Corey, who received the treatment a few days before her 21st birthday in 2013. "I can finally live my life the way I want to."

"What I saw in the clinic was remarkable," said Dr. Maguire to the panel. "Most patients became sure of themselves and pushed aside their guides. Rarely did I see a cane after treatment."

The vote for approval came in at a unanimous 16-0. Then all there was to do was wait for the final decision from the FDA.

On December 19, 2017, Drs. Bennett and Maguire got the call that Luxturna had been approved.

A BRIGHTER FUTURE

Luxturna marks many firsts. It is the first FDA-approved gene therapy for an inherited disease, the first pharmacological treatment for an inherited retinal degeneration, and the first gene therapy to use an adeno-associated virus vector. But, the most important *first* for this therapy is undoubtedly the opportunity it presents individuals with *RPE65*-related LCA. For the very first time, the one to two thousand people with this disease have a promising treatment option that will likely greatly improve their sight.

As of now, the therapy is available at only designated treatment facilities throughout the country, in order to ensure safe administration. On March 20, 2018, groups at three different institutions (Bascom Palmer, Children's Hospital Los Angeles, and Massachusetts Eye and Ear) simultaneously performed the first injections of Luxturna since the approval.

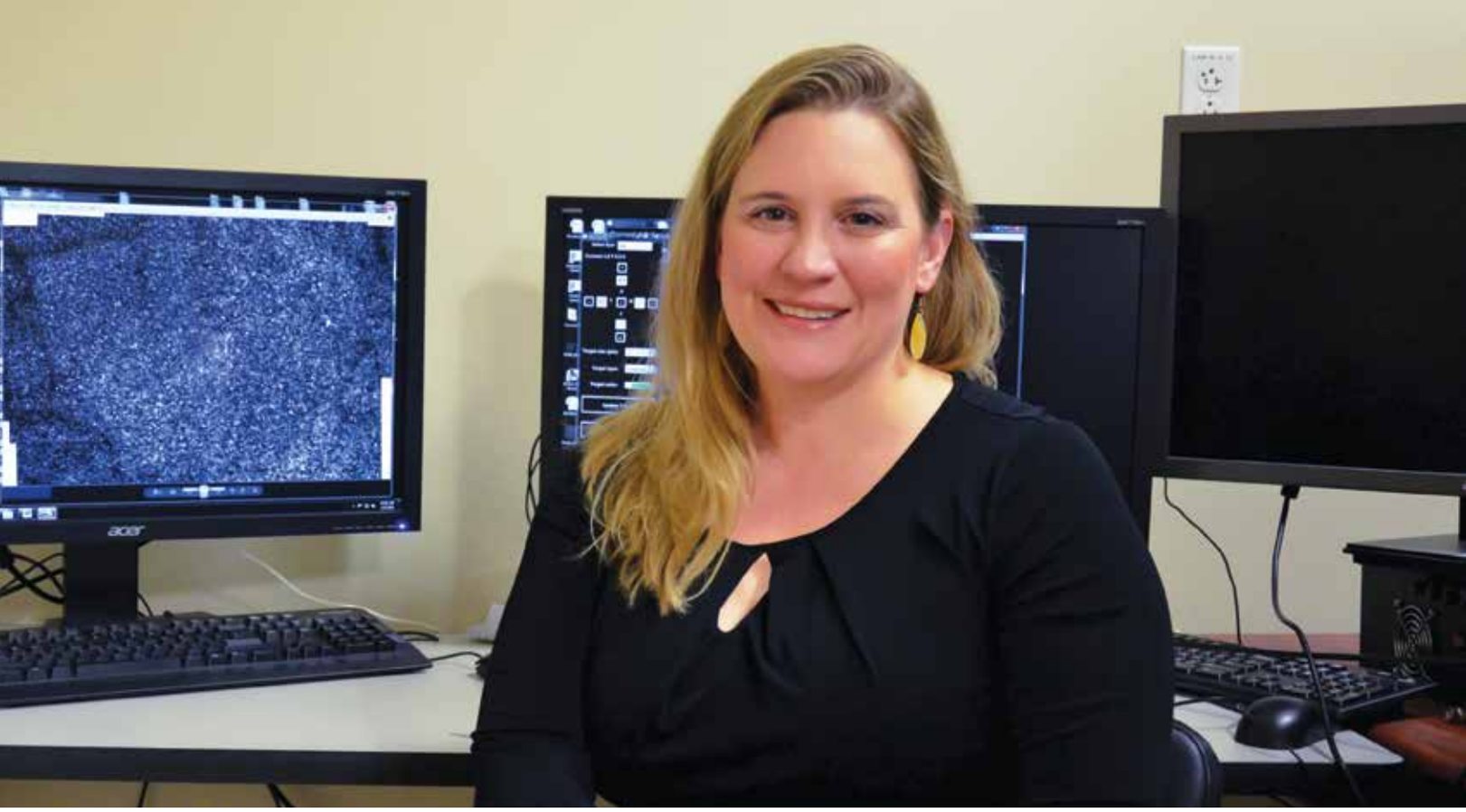
Not only will this technique help to restore sight in patients blind from LCA, but it will also guide the development of similar products for other blinding diseases. To date, 265 genes have been identified to cause inherited retinal degeneration—a sharp contrast to the zero genes identified when Dr. Bennett began her research. Today, there are close to three dozen ocular gene therapy trials in progress or follow-up, with even more targets being considered by various groups. A dozen additional ocular gene therapy targets are in the pipeline for clinical trials at Scheie and CAROT.

"I believe that the success of the Luxturna clinical development program will pave the way for the development of other gene therapies, that may help the millions of patients with genetic diseases who currently have limited or no treatment options," said Dr. Bennett, in a Spark press release.

The FDA agrees. "I believe gene therapy will become a mainstay in treating, and maybe curing, many of our most devastating and intractable diseases," said FDA commissioner Dr. Scott Gottlieb. "This milestone reinforces the potential of this breakthrough approach in treating a wide range of challenging diseases."

"It now sets a path for others to follow going forward, where there was none before," said Dr. Bennett, in an interview with *Penn Medicine Magazine*. "This is looking way down the road, but maybe not as far as you think."

On May 2, 2018, the Penn Medicine Board of Trustees celebrated the FDA approval of Luxturna. Dr. Joan O'Brien and Dean Larry Jameson presented Drs. Maguire and Bennett with a plaque commemorating the first dogs to receive gene therapy (including Mercury, posing with Dr. Maguire), who were later adopted by Drs. Maguire and Bennett.



the next step in **precision medicine**

By Rebecca Salowe

Researchers at the Center for Advanced Retinal and Ocular Therapeutics (CAROT) are seeking to expand the range of treatment options available to patients with hereditary blindness. Since receiving the Food and Drug Administration's approval of a gene therapy for Leber's Congenital Amaurosis, CAROT is focused on developing therapeutic approaches for other retinal degenerations. Dr. Jessica I. W. Morgan, an Assistant Professor of Ophthalmology, has a unique and vital role in this process.

In many retinal diseases, vision loss is caused by damage to rod and cone photoreceptors. Thus, researchers must be able to closely evaluate the structure and function of photoreceptors in order to gauge if a treatment is effective. Did the therapy help to protect and preserve these cells? Is a disease worsening – or has its progression been halted?

Dr. Morgan uses a technology called adaptive optics to answer these questions. Adaptive optics imaging provides high-resolution photos of individual photoreceptors, allowing her to evaluate how *single cells* are affected by treatments.

"Many advances are being made in regenerative medicine, gene therapy, stem cell therapy, and optogenetics – and all of those treatment approaches aim to restore function to individual cells," she explained. "And we now have the capability to noninvasively observe individual photoreceptors. The question is: can we use that information to assess if a treatment is safe and providing a benefit to patients?"

Dr. Morgan believes that the answer will soon be yes, with a bit more work. Currently, adaptive optics imaging provides information solely on *structural* changes in photoreceptors; this information has not previously been correlated with *functional* changes in vision. Thus, Dr. Morgan's current research focuses on understanding how the structural changes observed through adaptive optics imaging affect the function of those same photoreceptors.

In 2015, Dr. Morgan began collaborating with Dr. David Brainard, who had recently received a Stein Innovation Award from Research to Prevent Blindness. Together, they have incorporated two distinct methods of assessing photoreceptor function into the adaptive optics imaging system, with the goal of correlating this functional information with structural images.

The first method, cellular-scale microperimetry, measures cone function by testing a patient's response to a visual stimulus. The stimulus is focused on an individual cone, taking advantage of the high resolution provided by the adaptive optics system. "We flash a light that is received by one cone only and ask a patient, 'Did you see it? Did you not?'" explained Dr. Morgan. Over multiple trials, Dr. Morgan can then determine the 'threshold of seeing' at the individual cone level.

As clinical trials for gene therapy and other cellular therapies grow more common, Dr. Morgan's research on how these therapies alter photoreceptor structure and function will become more and more valuable.

The second method measures how the intrinsic reflectance of individual photoreceptors changes in response to light stimulation. Again, the stimulus is delivered through the adaptive optics system; cone response is then observed using infrared imaging light. Dr. Morgan tested this method on healthy controls, showing that intrinsic reflectance is an accurate reflector of actual cone function. These results were published in *Biomedical Optics Express*.

Now that these techniques have been successfully applied to healthy controls, the next step is turning to patients with retinal disease.

"We are now undertaking cross-sectional and longitudinal studies to compare functional responses from photoreceptors affected by retinal disease to those from normal controls," said Dr. Morgan.

These functional tests allow disease progression to be closely monitored in a way that was not previously feasible. Physicians will thus be able to provide a more precise diagnosis and prognosis to patients with retinal diseases.

"Ultimately, we want to use these methods to assess which photoreceptors in the retina take up a therapy and which ones do not," said Dr. Morgan. "The cells could regain normal function, regain partial function, stay steady, decline, or decline faster." This data provides valuable information on how many "treated cells" are needed to maintain good vision or improve vision. Or, in the event that a therapy fails, researchers can determine if a therapy should be amped-up to target more cells.

The first disease to be targeted is choroideremia, a rare retinal degeneration that causes gradual loss of vision in males. Phase I/II gene therapy clinical trials are currently in progress at CAROT. Dr. Morgan recently received a National Institutes of Health RO1 grant to conduct add-on studies to these trials.

"We already know that cone photoreceptors remain structurally present in near normal numbers in patients with choroideremia," explained Dr. Morgan. "However, our preliminary findings show that the functional response of these cells is reduced. Now we want to know whether gene therapy restores their function."

As clinical trials for gene therapy and other cellular therapies grow more common, Dr. Morgan's research on how these therapies alter photoreceptor structure and function will become more and more valuable. Her foresight in developing precise ways to evaluate disease outcomes may soon affect the diagnosis and treatment of many retinal diseases.

Dr. Jessica Morgan poses with adaptive optics equipment, which provides high-resolution photos of individual photoreceptors.

By Emma Wells

Assessing the Risk of Intraocular Bleeding from Blood Clot Medications

While newer antithrombotics have been increasing in popularity, their ocular safety profile had not been extensively researched.

A new analysis led by Brian VanderBeek, MD, MPH, MSCE, explored the ocular safety profile of novel antithrombotics.

Oral antithrombotic medications are a mainstay for preventing blood clots, but they have associated ocular risks. Because of the anti-clotting nature of these medications, certain antithrombotics have been shown to increase risk for intraocular hemorrhages (bleeding in the eye).

Antithrombotics designed to reduce the blood's clotting ability fall into two main categories: anticoagulants and antiplatelet drugs. Traditional anticoagulant therapies employ warfarin, which requires careful monitoring due to risk of excess bleeding. In recent years, several new antithrombotic medications that do not require routine monitoring have become increasingly popular. There are also several novel antiplatelet medications available, which are frequently prescribed instead of traditional antiplatelet therapies utilizing aspirin or clopidogrel.

While newer antithrombotics have been increasing in popularity, their ocular safety profile had not been extensively researched. "On top of that, there was a steady stream of case reports suggesting that the new ones were not as safe," explained Dr. Brian VanderBeek, an Assistant Professor of Ophthalmology and retina specialist at the Scheie Eye Institute. "And there was no real data to back this idea up other than case reports."

Recognizing this gap in the medical literature, Dr. VanderBeek set out to design a study assessing the risk of intraocular bleeding in patients taking novel antithrombotics. Dr. VanderBeek collaborated with Retinal Degeneration and Medical Retina Fellow Katherine Uyhazi, MD, PhD and UPenn clinical pharmacist and epidemiologist, Todd Miano, PharmD, MSCE. Together, they conducted a retrospective cohort study mining a large national insurance claims database. This analysis compared risk of intraocular hemorrhage from novel antithrombotics versus older medications over five years.

"We did two different comparisons, one for antiplatelets and one for anticoagulants," said Dr. VanderBeek. The antiplatelet analysis compared the incidence of intraocular bleeding in patients taking clopidogrel (older drug) to patients taking prasugrel (novel drug). A similar analysis for anticoagulants compared warfarin to the novel anticoagulants dabigatran and rivaroxaban.

The study, published in *JAMA Ophthalmology* in February 2018, found that newer antiplatelet medications were no more likely to lead to intraocular hemorrhage than traditional ones. Additionally, newer anticoagulants actually had an improved ocular risk profile, reducing the risk of having an intraocular bleed by about 25%.

Dr. VanderBeek stressed that the study should not be taken as medical advice. "Talk to your primary care provider to decide what's best for you," he said.

Expanded Options for Treating Dry Eye

By Ava Kikut

Dry Eye Disease (DED) is a common chronic condition that disproportionately affects women. DED occurs when an individual does not produce enough quality tears to protect and lubricate the eye. A lack of protective moisture causes severe irritation and sensitivity to light, and it can lead to scarring in the cornea and visual impairment. DED has many causes, including aging, hormonal changes, dry environments, contact lenses, certain medications, and autoimmune diseases. Treatments vary depending on the cause and severity of the condition. The Penn Dry Eye and Ocular Surface center at the Scheie Eye Institute is dedicated to meeting the specific needs of each patient.

Led by Drs. Giacomina (Mina) Massaro-Giordano and Vatinee Bunya, the Dry Eye and Ocular Surface Center expanded in 2016, becoming one of a dozen centers nationwide approved to offer customized scleral lenses. Scleral lenses are designed to treat symptoms of severe DED by holding soothing saline solution against the eye. Scheie's contact lens service has a full team of highly trained optometrists and technicians who specialize in scleral lens fittings. With grant support from the Board of Women Visitors, Scheie was equipped with a new slit lamp and special camera for fitting scleral lenses and recording the degree of dryness on the surface of the eye. The grant has also helped assist patients whose insurance does not cover the cost of the lenses.

"Scleral lenses may be better for a subset of patients who have nerve pain and are exquisitely sensitive to evaporation of the tear film. They can also help correct the vision if there are corneal irregularities," explained Dr. Massaro. For patients with these symptoms, the availability of scleral lenses and fittings at Scheie has made a world of difference.

In 2012, Deborah Pley was diagnosed with Sjogren's syndrome, an autoimmune disease that attacks the body's moisture glands, causing particularly severe symptoms of DED. "It feels like sand is in your eye—itchy, scratchy, blurred vision," she described. After being diagnosed with Sjogren's, Deborah sought specialized DED treatment from Dr. Massaro.

Dr. Massaro started Deborah on immunosuppressive drops, which helped reduce inflammation and increase tear production for a few years.

In December 2015, Deborah had an exacerbation of a viral infection in her left eye, which precluded her from continuing her immunosuppressive drops. Until the virus healed, Deborah had to rely on antiviral drops and over-the-counter drops to lubricate the outer surface of the eye. While artificial tears are a common remedy for DED, they are less effective and require very frequent application for patients like Deborah with severe symptoms.

As a pharmacist, Deborah works in front of a computer screen for a significant portion of the day, which exacerbates her DED symptoms. During the few months she was using artificial tears, Deborah had to pause from work every 15 minutes to reapply the drops. Additionally, the dryness caused sensitivity to light, limiting her ability to drive and participate in outdoor activities. "I really didn't go outside that much. I have wraparound sunglasses, and I would have to make sure I had them on. The brightness of the sun was just irritating." The sensitivity to light and dependence on artificial tears was isolating. "I didn't do as much socially because you just don't feel good. You can't see, you don't feel like going out. You don't want to go someplace and be putting drops in your eyes every 10-15 minutes," Deborah explained. During this period, the virus caused scarring in her cornea, damaging her vision.

When the virus subsided, Dr. Massaro prescribed customized scleral lenses, which were fitted in the new scleral lens center. For Deborah, scleral lenses have been even more effective and convenient than the treatment she used before the virus. She can now see better than she has in years. "Scleral lenses made life 100% better," Deborah said. "I'm not uncomfortable at work anymore," she added. "I can work a ten hour shift and it doesn't bother me…I like going outside when it's nice out—doing anything, washing the car, yardwork." Deborah expressed gratitude for the individualized care she received at Scheie. "Dr. Massaro and her team are very supportive and helpful and try to do whatever they can to get people to a better place."

Deborah's testimony illustrates that each experience with DED is unique and changes over time. In addition to scleral lenses, there are a number of treatments for DED, including anti-inflammatory steroid drops, inserts (lacriserts), punctal plugs, specialized contacts with amniotic membranes, autologous serum, nasal stimulating devices (True Tear), and oral neuromodulating drugs. While the same treatment may not work for everyone, the Dry Eye and Ocular Surface Center at Scheie is committed to finding and providing the most effective approach for each patient.

Dr. Massaro, Deborah, and contact lens specialist, Kathy McNelis, COA, NCLC

beautiful inside and out

By Emma Wells

The faculty and staff mourn the loss of Laura Ball, beloved Administrative Assistant at the Scheie Eye Institute. Laura passed away on February 1, 2018, after a lengthy battle with brain and breast cancer. She was 64.

Laura worked for Penn Medicine in various roles for 37 years, most recently as an Administrative Assistant for the Glaucoma Service at Scheie. She retired from Scheie in November 2017. Laura cherished the many friendships she made at Scheie, and she was loved and respected by her colleagues and patients alike.

Faculty and staff shared their memories of Laura and the myriad of ways she touched their lives.

"I started here at Scheie in 1983. Over the years I have been at the HUP location and now at Radnor. For the most part, my conversations with Laura were over the phone but always received with the kindness she would show if in person. Her goodness and authenticity never wavered. Laura was one of those rare people that if you're fortunate, you appreciate all along the way."

— Cathy Lawn

"I will always remember her loving and caring spirit, with a smile to top it off. She made your feelings hers, which made you feel loved and inspired in return."

— Nekisha Ammons

"I met Laura 30 years ago when I began working at Scheie. Laura has always been a beautiful person inside and out. She would give everyone the most pleasant smile even when she was rushed. She never said anything negative about anyone, and when you spoke with Laura you knew you would get an encouraging word. She was definitely one of the most positive people I knew. I'm glad I had the privilege of knowing such a loving soul."

— Debra Dana

"Laura was a sweet, gentle soul. She was such a delight to see and greet every day. She was patient with everyone she interacted with, patients, faculty, and staff. It was because of her and several others that the African American Celebration was brought back. Thanks for bringing the community together, Laura."

— Lila Lapides

"Laura had such a positive impact on my days at Scheie. She greeted everyone with a warm and heartfelt smile that matched her sincere and kind essence. She truly was a beautiful person, both inside and out!"

— Sheri Grand Drossner

"The last time I saw Laura was shortly after her father passed away. Our paths frequently crossed in the hallway, and she always had a friendly, smiling face and took the time to ask how I was doing. I thought this was an incredibly thoughtful act, especially during the time of her father's unexpected and untimely passing. Laura had a smile as warm and as bright as anyone I have ever known. During years of African American History Month Celebrations, I had the wonderful opportunity to work with Laura and to enjoy her creativity, problem solving, warmth, and kindness toward every person she encountered. Laura will always live on in my memory."

— Joan O'Brien

"Her lovely spirit and deep faith in God were always inspirational to me."

— Cheryl Devine

"I had the pleasure of meeting Laura 12 years ago. Laura's inner and outer beauty was visible. Her positive spirit was displayed in her walk, talk, and poised look. I would visit her in her office, and we would have the best conversations. If you were having a bad day, her presence alone would lift your spirits. Her kind and caring words would make you feel like everything will be fine. I thank God for bringing her into my life! Laura, you will be truly missed!"

— Donna Kirkland

"Laura was one of a kind. Warm, caring, and giving. She was very special and I will miss her a lot."

— Prithvi Sankar

"When Laura told me she was interested in joining the Glaucoma Service as our Administrative Assistant I thought I'd gone to heaven. Laura's effervescent personality and positive attitude uplifted me on even the worst days. The patients absolutely loved her. Her spirituality nourished us. I think of Laura every day, of talking and laughing with her. She was a bright star who blessed us all. Thank you, Laura, for being part of the Glaucoma family. I miss you."

— Eydie Miller-Ellis

"Laura greeted me with the most welcoming smile on my very first day here at Scheie. I was assigned to train with Laura, and I was so amazed by her patience and all the compassion she showed every patient. She seemed to know most of them and loved them like family. I could see the great respect the staff showed her. Laura knew how to lift your spirits and pray with you, especially during sorrowful times. I'll always remember the enjoyable visits to her office, whether planning for our annual African American Celebration or just sharing our family life events. Laura's laughter was contagious! We'll remember Laura here at Scheie always with love and great respect."

— Cheryl A. Nathaniel

"When my father died, Laura gave me a simple porcelain angel as a gift of remembrance. The words, 'You will always be in my heart' are written subtly on the doll. It was an elegant and kind memento. When I look at it now, I realize it is the same gift she gave to each of us. She was relentlessly elegant and unwaveringly kind. That was her unique gift and her perpetual legacy."

— Thomasine Gorry

"Laura and I met 30 years ago at Scheie and who would have ever thought that God would bless me with such a remarkable friend, sister and lunch partner. When you saw one the other wasn't far behind. When Laura and I met, we instantly clicked. As the years progressed, I can truly say that she became a member of my own family. She was present at every family celebration, coming early to ensure that decorations were pristine and staying late because she loved to talk. I can say that Scheie will not be the same without her beautiful soul."

— Phyllis Robinson

faces of SCHEIE:

Ophthalmic Technicians, with a spotlight on Lang Lourng Ung

By Ava Kikut

You are just finishing reading an article in *Scheie Vision* when your name is called. You look up to see a petite woman in royal blue scrubs standing in the doorway between the lobby and the clinic. The woman leads you into an empty exam room and introduces herself. "My name is Lang. L-A-N-G."

An ophthalmic technician, Lang first asks your name and date of birth. She types notes as you answer questions about your symptoms, pain level, and health history. She hands you what looks like a masquerade mask with one eye hole and asks you to read letters from a screen across the room. She performs a peripheral vision test, asking you to say how many fingers she is holding up on either side of your face. She turns off the overhead light and shines a bright beam in each of your eyes.

Lang performs each test with energy. You are one of dozens of patients she has seen today, but it doesn't show. Like the other technicians at the Scheie Eye Institute, Lang loves working with people. She is thoroughly trained, detail-oriented, agile, and compassionate. She seamlessly gathers information for the physician while making you feel comfortable.

Technically, Lang is one of Scheie's newest technicians. But she has known this eye institute longer than most of the staff and faculty. Lang trained in the Scheie Medical Technologies Program during the mid-1980s, only a few years after her family immigrated to Philadelphia from Cambodia.

Lang was eight when the Khmer Rouge (communist party) seized power in Cambodia in 1975. Her family was evacuated from their village and placed in an agricultural labor camp for the next four years.

When the Vietnamese invaded in 1979, bringing an end to the Khmer Rouge Regime, Lang and her family fled the work camp and returned to their home village. Shortly after, her parents decided to leave Cambodia to find a better life. They paid in gold to be escorted to a point close to the Thai border, walked several miles through the jungle, and made it to a refugee camp in Thailand, only to be turned around.

"The Thai officers forced us at gunpoint to get on a bus," said Lang. As they rode through Thailand, villagers tried handing Lang and her family plastic bags filled with water and rice through the bus windows. Confused by the gesture, they didn't take the bags. "We could not speak their language, but we could see the sadness on their faces, like they wanted to tell us something but

Top left: Lang outside Scheie in 1986, while attending the Ophthalmic Medical Technologist Training program. **Top right:** Lang outside Scheie in 2017. **Bottom left:** COMT Graduation in June 1989 [Left to Right: Linda Griffith, Michele, Lang, Michele Piccone, MD (Resident Class '92)]. **Bottom right:** Michele and Lang outside Scheie in 2017.

Lang was eight when the Khmer Rouge (communist party) seized power in Cambodia in 1975. Her family was evacuated from their village and placed in an agricultural labor camp for the next four years.

they couldn't." The buses drove through Bangkok and across the border, leaving the refugees back on the Cambodian side of the Himalayan Mountains.

Lang and her family used ropes to hoist themselves down the slopes and through minefields. Over the next several months, they moved from sunrise to sunset from one village to the next, where Vietnamese soldiers guarded them from Khmer Rouge soldiers that had retreated into the jungle. With no food, clean water, or medical help, many of the travelers didn't survive.

"Along the way we lost a few more family members," said Lang. "I lost an uncle who was thirty years old. He stepped on a piece of bamboo and could have been cured with antibiotics, but we didn't have any."

When Lang's family returned to their village, their property had been taken by neighbors. "We had lost everything," she said. Her dad decided to take the family back to Thailand a second time. "I was twelve years old. I was too scared. I came along unwillingly. Now I'm glad I came here. I wouldn't know where my family was if they had left me behind."

The second time around, Lang, her siblings, and her parents were accepted into the Thai refugee camp. A year later, they moved to a camp in the Philippines, where her youngest brother was born. The family remained in the Philippines for a year, before coming to the United States, through San Francisco, to Philadelphia.

Lang's family joined a refugee community in West Philadelphia. They moved into an apartment on 40th and Market, just above a Chinese restaurant. Lang and her siblings matriculated at University City High School across the street from the Scheie Eye Institute.

By that time, Lang was fourteen. She had not attended school for six years. She had been forbidden from speaking any language other than Cambodian under the Khmer Rouge, and would need to relearn other languages she knew prior to the war. Every afternoon, she and her siblings went to the University of Pennsylvania for English and math tutoring with study abroad undergraduate students from China. Afterward, they attended evening typing classes at West Philadelphia High School. On Saturdays they took Mandarin lessons at South Philadelphia High School. At home, they relearned Cantonese by watching Chinese movies. During the summers, Lang and the other refugee children attended school four days a week and picked blueberries for $3.25 a case the other three days.

Just as everyone pitched in with berry picking, all the siblings were expected to help support the family as soon as possible. After high school, Lang enrolled in an associates program at Harcum Junior College in Bryn Mawr, PA. While she was attending Harcum, the school's program director found an advertisement in the *Philadelphia Inquirer* for an ophthalmic medical technologist

Lang (second from left) and her family, after moving to Philadelphia in 1983.

When Lang returned to the Scheie technician team in October 2017, she immediately felt at home. "This is where I belong," she said.

training program at the Scheie Eye Institute.

"I didn't even know what ophthalmology was," Lang said. Nevertheless, she needed work and it sounded like a good opportunity. Scheie was only a block from where her family lived. Additionally, she learned, there were only eight accredited medical technologist training programs in the country at the time. "So I said to myself, I'd better go because that means there will be a job." With the support of sponsors from Swarthmore College, Drs. John and Gail Gustard, Lang entered Scheie's ophthalmic technician training program in 1986.

In ophthalmology clinics, technicians play a significant role in optimizing the quality and efficiency of care. Technicians at Scheie all become certified by the Joint Commission on Allied Health Personnel in Ophthalmology (JCAHPO) as Ophthalmic Assistants (COAs), Ophthalmic Technicians (COTs), and/or Ophthalmic Medical Technologists (COMTs). Technicians prepare patients for exams and procedures and relay necessary information to physicians, including health history, medications, allergies, vitals, visual acuity, refractometry, lensometry, intraocular pressure, and several other measurements. Lang enthusiastically learned to perform these specialized preliminary screenings and tests. A people person, she enjoyed the opportunities to interact with patients as a technician, especially in pediatrics. In 1988, after completing COT training, Lang became a full-time ophthalmic technician at the Children's Hospital of Philadelphia (CHOP).

In addition to working at CHOP, Lang also worked as a scribe technician every other weekend in the Scheie operating room (OR). At the time, there were only two ophthalmic technicians assisting physicians in the OR: Lang and Michele Sheehan. Lang had been a year ahead of Michele in the medical technologist training program and had helped to train her. The two enjoyed working together and became close friends.

Lang worked as a technician for ten years, before taking time off to focus on her three kids—a daughter, now a junior at Rutgers University, and two sons, currently attending Cherry Hill High School East. In the fall of 2017, she felt ready to return to work as a technician and was excited to learn of an opening at Scheie.

When Michele Sheehan, now the Director of Ophthalmic Technicians at Scheie, saw Lang's application she was ecstatic. "I knew I wanted to hire her right away," Michele said. "I knew what a sweet, kind, wonderful technician she was." When Lang came to Scheie for an interview in the fall of 2017, she was excited to reconnect with her old friend. "The last time I saw Michele was at my wedding in 1994."

Lang also met Lina Sanchez, the Manager of Technicians and Scribes. During the interview, Lang recounted her family's experiences leaving Cambodia and coming to Philadelphia. Lina was so moved by Lang's story she couldn't let herself blink. "I didn't want her to see me cry," she said.

When Lang returned to the Scheie technician team in October 2017, she immediately felt at home. "This is where I belong," she said. "Every day I am excited about my job. This department is unique because it is so well-organized. The team is also special in that it is filled with people who care about each other, including our wonderful managers. The patients are so nice and friendly; they make each day a joy. Our job is very rewarding because we help people see better. I have deep gratitude to all of the Ophthalmology Department's faculty, staff, fellows, and residents, and especially for the other ophthalmic technicians. Thank you for welcoming me a second time. Words cannot express how overjoyed I am every day at Scheie to be surrounded by such a great team."

Jonathan Prenner, MD

Alumni Spotlight

By Rebecca Salowe

Dr. Jonathan Prenner may live in the heart of Princeton's campus, but he is a Penn Quaker at heart.

Originally from New York, Dr. Prenner received his undergraduate degree at the University of Pennsylvania and his medical degree at the State University of New York at Stony Brook. After completing an internship at Long Island Jewish Medical Center in 1999, he moved back to Philadelphia for his residency at the Scheie Eye Institute.

Dr. Prenner distinctly remembers one of the reasons why he chose to pursue ophthalmology. "One of my fraternity brothers, Rick Kaiser, was a resident at Scheie when I was choosing a field," he said. "He loved ophthalmology. I figured that if he liked it, then I would as well. Not a great method of decision making, but it luckily worked out."

Dr. Prenner described his time as a Scheie resident as a "homecoming" for him. "It was a warm and nurturing environment that fostered intellectual curiosity and academic achievement in concert with clinical excellence," he said. When looking back, he most remembers building strong relationships with friends and mentors at Scheie, and still cherishes these "rare relationships."

In particular, the mentorship of several faculty members (Drs. Jeff Berger, Al Maguire, and Sandy Brucker) helped Dr. Prenner choose a career as a retina specialist. "The camaraderie and fulfillment that went along with caring for people with severe diseases was inspiring," he explained. "It was an outstanding era, when retina was really the specialty of the house."

After completing his vitreoretinal fellowship with the Associated Retinal Consultants at William Beaumont Hospital, Dr. Prenner joined NJ Retina, a 20-doctor private practice specializing in retina. Two other Scheie graduates, Drs. Paul Hahn and Leonard Feiner, now serve as his partners. Though a high-volume clinical practice, NJ Retina also focuses on independent research and clinical trials. Dr. Prenner particularly enjoys researching and publishing on novel surgical techniques regarding complex intraocular lens surgery.

In 2017, Dr. Prenner was named the Chairman of the Ophthalmology Department at Rutgers Robert Wood Johnson Medical School. In this role, he hopes to continue to strengthen the mentoring program for medical students interested in ophthalmology. He is thrilled that the vitreoretinal surgery fellowship program has become one of the highest volume surgical programs in the nation.

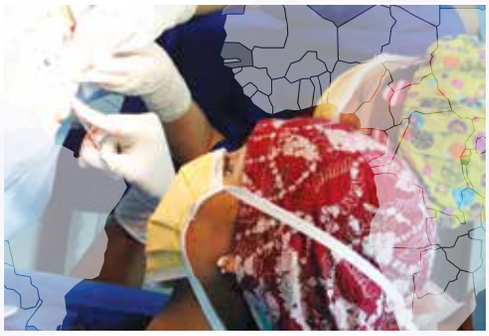
Today, Dr. Prenner lives in Princeton with his wife, Becky, and two children, Sofia (13) and Max (8). They love living in a college town and close to family in New York.

"Scheie really gives residents the foundation required to have a superb career," Dr. Prenner concluded. "I am exceptionally grateful to have benefitted so extensively from both Scheie and the University."

Bringing Eye Care Across the World

By Emma Wells

Dr. Sonul Mehta



Dr. Mehta operating on an orbital lesion in Guatemala

Dr. Sonul Mehta, an Assistant Professor of Ophthalmology and an oculoplastic and reconstructive surgeon, is passionate about providing medical care to underserved populations. At least once a year, she travels internationally to provide medical services to areas with limited access to eye care.

She has taken multiple trips to the Philippines, China, India, and various parts of Southeast Asia, as well as Ecuador, Guatemala, Panama, and other parts of South America.

During these service trips, Dr. Mehta is part of a team of surgeons, anesthesiologists, operating room nurses, and ophthalmic technicians. This group sets up a tent hospital, performing anywhere between 50 and 100 surgeries a day. "We try to provide as much medical care as possible in the short period of a week," said Dr. Mehta. "The goal is to see, evaluate, and treat as many patients as we can."

For more complex procedures, the team joins forces with local physicians and hospitals. "This gives an opportunity for local physicians to learn to treat these more complex conditions and to better understand how to treat them post-operatively, so they can then treat more of their population," explained Dr. Mehta.

One of the greatest challenges when volunteering abroad is a lack of resources. "We bring as many supplies as we can, everything from sutures to donated glasses to instruments," said Dr. Mehta. But access to imaging modalities and medications, such as antibiotics to prevent post-operative infection, remains limited.

Though challenges arise, Mehta views her international service as some of the most rewarding work she has done. "The patients continue to inspire me," she said. "So many times, patients will wake up from surgery with the ability to see again after not seeing for 30-plus years, and the joy on their faces is so contagious. It's truly a second chance at life." Dr. Mehta plans to continue taking part in service throughout her career because of the joy and gratitude it summons. "Through each service trip, I've learned that improving the lives of those who need it most is like no other feeling you can imagine. You come back and you feel so grateful for what you have."

"In many parts of the world, there is one ophthalmologist for a million patients. Many patients do not have access to an ophthalmologist or medical professional, while others do not have the means to be evaluated and treated. Today, 180 million people in the world suffer from blindness—but 80% of world blindness is avoidable. It's just a matter of getting adequate care and medical attention to them."

–Sonul Mehta, MD

This young girl from the Philippines suffered from strabismus and lid ptosis. She is one of eight siblings, and because of her impaired vision, her parents did not send her to school. She and her aunt travelled three hours to bring her to the clinic for surgery. She is now attending school.

Wait lines for treatment in the Philippines

Walker will be remembered for her limitless kindness and generosity.

walker kirby

By Emma Wells

We are deeply saddened by the loss of Walker Kirby, a patient, friend and generous donor of the Scheie Eye Institute for many years. She passed away on November 11, 2017, at the age of 93.

"Through my seven years as Chairman I came to know Walker well," said Joan O'Brien, MD. "Walker loved back porches, the beautiful trees her husband cherished, and the summers and holidays spent with her loving family. Over the years, I learned very much about the family she cared for so deeply. I will miss her very much, as she had become a dear friend."

Walker grew up in Greensboro, North Carolina. In 1949, she married Fred Morgan Kirby II, who was the former chairman and CEO of Alleghany Corporation, as well as the president of the F.M. Kirby Foundation. When Fred passed away in 2011, Walker told Dr. O'Brien she would never stop missing her late husband, but "that was the price she willingly paid for such a happy marriage."

Walker and Fred had four children, ten grandchildren, and eight great-grandchildren, all of whom they loved beyond measure. "It was an honor and a pleasure to care for Walker Kirby," said Joshua L. Dunaief, MD, PhD. "She would always tell me about the meaningful pursuits of her children, grandchildren, and great-grandchildren. She loved them, and felt deeply loved and cared for by them."

Walker will be remembered for her limitless kindness and generosity. She devoted her life to philanthropic work, and her contributions to Ophthalmology at Penn were many.

Walker served as a board member of the F.M. Kirby Foundation for over 30 years, a family foundation established in 1931 by her grandfather-in-law. Penn's F.M. Kirby Center for Molecular Ophthalmology was founded in 1994 with a generous gift from the F.M. Kirby Foundation, which has continued to provide consistent support to the center for nearly 25 years. This support has been instrumental in several high-impact research advances.

In 2015, Scheie Eye Institute established the Walker D. Kirby Ophthalmology Medical Student Award. This award is given every year, in perpetuity, to a medical student graduating from the Perelman School of Medicine who plans to pursue ophthalmology and who embodies Walker's core values of respect, loyalty, perseverance, empathy, responsibility, and honesty. "She was so thoughtful to meet with the student who received the award and best embodied Walker's values," said Prithvi Sankar, MD, the Director of Medical Student Education at the Department of Ophthalmology. "Her kindness and generosity were so admirable and will continue to live on with all her efforts."

Also extraordinary was Walker's devotion to The Seeing Eye, a philanthropic organization in Morristown, NJ, that trains guide dogs for people with visual impairments, where Walker sat on the board for 30 years. Walker initiated a program at Seeing Eye called Walkie's Walkers, which organizes play and exercise breaks for puppies undergoing rigorous training. In 1991, The Seeing Eye awarded her the Dorothy Harrison Eustis Humanitarian Award.

Equally remarkable as her life-changing philanthropic work were the small kindnesses that Walker extended to everyone she met. Dr. Dunaief keenly remembered Walker's thoughtful gestures. "During her visits, she would always inquire about our latest research on retinal disease. Without fail, she would bring a gold bag of peanuts from North Carolina—the best my colleagues and I have ever tasted!" added Dr. Dunaief. "I will miss her, and the memory of this warm, altruistic, dignified woman will continue to serve as an inspiration."

Dr. O'Brien concurred: "For many years we shared lunch together, and she always brought me a thoughtful gift when she visited. Walker will never be forgotten by me, the Scheie Eye Institute, and the medical students who carry her values forward to care for others as Walker always did. I too will try my very best to exemplify the values she taught me."

144 YEARS

OF THE DEPARTMENT OF OPHTHALMOLOGY

Dr. Joan O'Brien (left) and Dr. Monte Mills (center) present Dr. Graham Quinn (right) with a Philadelphia Bowl.

By Emma Wells

The Department of Ophthalmology celebrated its 144th Anniversary at the Scheie Alumni Meeting this past April. The weekend provided an opportunity for alumni to reconnect with old friends and discuss the most current advances in ophthalmology research.

Friday and Saturday were packed with lectures and presentations of research and clinical case studies from each subspecialty. Topics spanned retinal degeneration, neuro-ophthalmology, oculoplastics, pediatric ophthalmology, glaucoma, retina, and cornea.

The 2018 Honored Alumni Lecturer was Dr. Michael Kazim, who is a Clinical Professor of Ophthalmology and Surgery at Columbia University. Dr. Kazim delivered a captivating lecture titled "Evolution of the Precision Care of Optic Nerve Glioma." Dr. Graham Quinn, a Professor of Ophthalmology at Penn and an Attending Surgeon at Children's Hospital of Philadelphia (CHOP), gave an equally inspiring Annual David M. Kozart Memorial Lecture on "Retinopathy of Prematurity: Where are We Going and Why?"

The Department continued its tradition of hosting a celebratory dinner at the Rittenhouse Hotel on Friday evening. The evening was filled with delicious food, lively conversation, and dancing with old friends and colleagues. Heartfelt speeches were given in honor of Dr. Quinn's 40 years of service at Scheie and CHOP.

Please save the dates of April 12 and 13 for the 2019 Scheie Alumni Weekend.

Many thanks to Course Director Dr. Stephen Orlin, Course Co-Directors Drs. Alexander Brucker and Vatinee Bunya, and Lea Bramnick and Karen Cope-Scarfo for organizing this meeting.

dear friends

Scott M. Goldstein, MD
Pediatrics & Adult
Oculo-Facial Plastic Surgeon
Tri-County Eye & Wills Eye Institute

Family. There is nothing like it. We share a common ancestry and linkage that cannot be broken. We grow up in the same home and eventually develop wings strong enough to take us away from the nest, yet our bonds always remain. As time passes, it gives us perspective to reflect on the past and the lessons learned from our siblings, parents, and grandparents.

Life as a student, resident or fellow really isn't much different. We "grow up" together, learning along the journey from those with more experience before we head out into our own practices. Yet the bonds formed last our entire career. Every time we cross paths after going our different ways, we share stories of days long gone while catching up on family and life. We reflect on our training and those who trained us.

Scheie Eye is a special place with a great history and great people. This year's spring Alumni meeting saw the return of Oculoplastics Fellow Dr. Mike Kazim and the recognition of Dr. Graham Quinn, Pediatric ophthalmologist extraordinaire, for his long and distinguished career at Penn and CHOP. Many former residents and fellows returned to share their knowledge and celebrate our common bonds. It was a great weekend, as always, enjoyed by all who came. We are always happy to see our extended family come home. So don't be a stranger! Continue to keep in touch and join us throughout the years in the spring and fall, or whenever in Philly! You'll be amazed at how much we have grown!

Scott M. Goldstein, MD Res '00, Fel '02
President, Scheie Alumni Society

Find us online at **www.pennmedicine.org/departments-and-centers/ophthalmology** or **www.facebook.com/ScheieEye**

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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 144 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
215.662.8415
Or by email:
Rebecca.Salowe@uphs.upenn.edu

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