Columbia University Medical Center

Viewpoint

A publication of The Edward S. Harkness Eye Institute and The Department of Ophthalmology in the College of Physicians and Surgeons

FALL 2017/WINTER 2018

Transforming Cataract and Corneal Surgery

Cataract surgery is one of the oldest surgical procedures known to humans. Wall paintings found in Egyptian tombs dating back to 1200 B.C. depict a procedure known as "couching," which involved using a sharp instrument to push the cloudy lens into the back of the eye, leaving the patient with limited—but unfocused—vision. The first modern cataract surgery involving true extraction of cataracts from the eye was performed by French ophthalmologist Jacques Daviel in 1747.

Leejee Suh, MD

For many people today, the mention of cataract surgery invokes memories of the thick "Coke-bottle" glasses that their parents or grandparents had to wear after having the clouded lens removed entirely, or of days and weeks they spent in the hospital recovering from extensive surgical procedures. But today's cataract surgery, involving state-of- the-art machines and lasers, can take as little as 15-20 minutes with minimal recovery time and restore patients to vision that in some cases is better than even before they developed the cataract.

"Our patients no longer go from virtually blind to seeing reasonably well, but to seeing better than they ever did before, with less spectacle dependence," says Leejee Suh, MD, Miranda Wong Tang Associate Professor of Ophthalmology and Director of the Laser Vision Correction Center as well as the Cornea and Anterior Segment Service. "I hear it from my patients all the time: 'I've never been able to see like this.' It has a huge impact on their quality of life."

Columbia University is at the forefront of modern cataract surgery, offering two different methods of cataract surgery. In the standard method, also known as phacoemulsification, the surgeon makes an incision into the cornea with a blade, breaks the cataract into pieces with phacoemulsification energy, and then implants a new artificial lens into the eye. A more recent development in cataract surgery is Femtosecond (FS) laser-assisted cataract surgery (FLACS) in which the laser makes incisions in the cornea and lens, followed by the surgeon removing the cataract and inserting the artificial lens implant manually like in the standard surgery. "Femtosecond laser-assisted cataract surgery can very precisely center the new intraocular lens in the eye, with the option of reducing

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INSIDE

Everybody Rise: Renovated Harkness Eye Clinic Opens

Moving up appropriately characterizes the newly renovated Harkness Eye Clinic. The new Eye Clinic, part of the NewYork-Presbyterian Ambulatory Care Network, moved from the Harkness basement to the first floor of the Eye Institute and opened its doors to patients in September. With 16 exam rooms, and multiple diagnostic and treatment spaces offering advanced imaging and laser technology, the new facility provides an attractive, modern, and highly functional environment for patients, staff, and physicians – residents and attendings – who work in the clinic. Patients appreciate the natural light from the ample windows and enjoy views of the Hudson River.

The move from the basement of the Eye Institute was highly symbolic, says Jason Horowitz, MD, A. Gerard DeVoe – B. Dobli Srinivasan Director of the Harkness Eye Clinic and Assistant Professor of Ophthalmology. "We now share the first floor with the main faculty practice facility. This sends a powerful message to our patients and the resident physicians from NewYork-Presbyterian. While the quality of medical care has always been stellar, the new surroundings clearly demonstrate that we strive for and are committed to providing a level of community care that

Jason Horowitz, MD, Clinic Director

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View from the Chair

Dear Friends,

The cornea is virtually unique among the tissues of the body, in that it contains no blood vessels to nourish and protect it. This clear, dome-shaped outermost surface of the eye is essential to healthy vision and particularly vulnerable to injury. In this edition of *Viewpoint*, we focus on the work of our highly skilled clinicians and researchers who offer advanced treatments for corneal disease and trauma, including the cornea service director, Leejee Suh, MD; surgeon-scientist David Paik, MD; noted laser vision correction pioneer Stephen Trokel, MD; and Danielle Trief, MD, MSc, who heads the new pediatric corneal clinic.

Dr. Suh also directs our Refractive Surgery Center, which has recently moved to newly renovated space in our conveniently located 880 Third Avenue location in midtown Manhattan. There, our patients not only have access to the latest laser vision correction technology, but also a wide array of general and specialized optometric services, including medically necessary contact lens fitting.

Our emphasis on Precision Ophthalmology™ positions the Department as an ideal partner for *All of Us*, a historic national initiative spearheaded by the National Institutes of Health aimed at accelerating research by gathering data on more than one million diverse individuals. Columbia is leading the New York City Consortium of health care providers working to engage patients in All of Us, and the Department of Ophthalmology has gladly taken the lead in recruiting patients to participate in this important research effort.

I am delighted to announce that the Department of Ophthalmology now has nine tenured professors, as Ronald Silverman, PhD, and Xin Zhang, PhD, were both awarded tenure over the summer. In this issue of *Viewpoint*, we discuss the meaning of tenure and describe their important work.

Last spring, we featured the opening of the Jonas Children's Vision Care Center, our state-of-the-art pediatric ophthalmology center. This fall, we welcome the administrative director of the center, Lisa Hark, PhD, RD, who will help to build its national reputation as a top referral program.

If you were in the United States on August 21—and even if you weren't—you probably gave at least some thought to whether and how to view the "Great American Eclipse." With "eclipse fever" gripping the nation, we created an educational video and accompanying materials featuring retina service director Tongalp Tezel, MD. The multi-media offerings drew nearly one million visitors to the medical center's newsroom.

When I assumed the position of chair five years ago, one of my first priorities was to relocate the Harkness Eye Clinic from its longtime place in the basement of the Eye Institute, to renovated, modern space on the first floor that reflects our commitment to offer clinic patients the highest quality vision care, and to give the residents and attendings the best possible experience in providing that care. My thanks to everyone who helped us finally make that vision a reality when we opened the renovated Eye Clinic this fall.

Thank you, as well, for taking the time to learn about our work through the *Viewpoint* and for your dedication to our mission of improving and restoring vision, advancing scientific understanding of ocular function, and nurturing the next generation of ophthalmologists and ophthalmic scientists.

Sincerely,

G. A. (Jack) Cioffi, M.D.
Jean and Richard Deems Professor
Edward S. Harkness Professor
Chairman, Department of Ophthalmology

Everybody Rise: Renovated Harkness Eye Clinic Opens

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matches the very high standards set in Columbia's Ophthalmology private practice locations. That has always been true, but the new facility crystallizes the message for patients, support staff, attending and resident physicians."

G.A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor and Chairman of the Department of Ophthalmology, envisioned the new clinic space when he assumed the chair's position five years ago, but because the new location had been occupied by other practices, an intricate choreography of relocation had to be scheduled over years.

"Orchestrating this move in a 90-year-old building with many infrastructure idiosyncracies presented a daunting challenge. The minimal disruption to patient care during the clinic move is a credit to the entire team," says Dr. Horowitz. "It was a building-wide endeavor, from the basement to the roof, but at no time did the move interfere with clinical practice or surgical procedures. Harkness Eye Clinic patients continued to get superb care and now have the physical space that appropriately symbolizes that quality."

For residents, the contrast between the new facility and the old clinic is almost literally night and day, says residency program director Royce Chen, MD, the Helen and Martin Kimmel Assistant Professor of Ophthalmology. "There's actually exposure to sunlight! We have better access to internet and cell phone connectivity, and I've heard residents joking that the space is so much nicer that they don't mind staying late anymore. I was here as a resident several years ago, and while the clinic has always been one of the gems of the ophthalmology program, the location in the basement did affect perception."

Patients and staff alike have been delighted with the new space as well, says clinic nurse Librada Sosa, RN. "The patients love the setting, and the space is very well organized, which facilitates our work in teams." The clinic's close proximity to the faculty practice also allows for an even greater degree of interaction between residents and attending staff as well as convenient access to the imaging suite.

"The complete renovation of the Harkness Eye Clinic stresses the importance that we place on caring for our Washington Heights neighborhood," says Dr. Chen. "To our patients, it says that no matter what your socioeconomic status, we want you to get the best possible care in the world. And to our residents, it says that we care about the environment in which you work, and we want you to have a state-of- the-art space that matches the caliber of the residents we can get. Our program is really hitting its stride and can compete with the top programs in the country, and we now have a resident clinic to match."

The Eyes of a Child: New Pediatric Cornea Clinic Opens

There are many different corneal diseases that can affect children, including congenital as well as acquired conditions, but relatively few experts around the country specialize in treating corneal disease in children. One of those experts, Danielle Trief, MD, MSc, Assistant Professor of Ophthalmology, has now launched a specialized Pediatric Cornea Clinic at Columbia.

"I had kids with corneal disease scattered throughout my practice, but now we've consolidated the cases into a clinic held on every second Friday of the month," says Dr. Trief. "The clinic is rapidly growing and we expect to expand it to a full-day clinic soon. If we fill up that day, then we'll add another." The clinic, which cares for patients from all backgrounds regardless of insurance status, is supported in part with funding from the Jonas Family Fund and an anonymous donor.

Some of the most common conditions Dr. Trief cares for include the complications of severe, chronic allergies, including blepharitis and inflammation of the conjunctiva. "During allergy season, we see many children with vernal conjunctivitis, which can cause an ulcer that thins out the cornea over time," she says. Often, this condition can be treated with standard allergy medications, but sometimes it also requires steroid treatment. Usually the thinning is reversible with this treatment, but if the cornea becomes very thin, on rare occasions a procedure is required to implant an amniotic membrane, which has anti-inflammatory properties that can heal ocular surface disease. If there is severe scarring, occasionally corneal surgery is necessary.

Rarer conditions found in children include congenital corneal opacities. "Sometimes children are born with opacification [clouding] of the cornea, because it did not develop properly and is missing a layer. If the opacification is not treated properly, the child can have poor vision for the rest of his or her life," Dr. Trief says. "And children with congenital glaucoma, because of the number of surgeries they have been through, can sometimes develop swelling of the cornea."

In these cases, Dr. Trief will perform a partial corneal transplant to restore the lost cells of the cornea. "It's a nice procedure for children because less tissue is involved, which means that there is lower risk of rejection and fewer stitches than with a full transplant, and they have a much faster recovery."

Some children, however, require a full corneal transplant—one of these conditions is a congenital clouding of the cornea called Peters anomaly, which can be caused by many different genetic and non-genetic factors. "The cornea doesn't develop properly. This is because the natural lens or iris adheres to the cornea and it becomes opacified," says Dr. Trief. "In that situation, we have to replace the whole cornea. A traumatic injury will also sometimes require full corneal replacement, as can progressive keratoconus."

Treating corneal conditions in children poses a number of unique challenges. "For example, the tissue of a child's eye is different than the ocular tissue of an adult. It's flimsier and there is high posterior pressure in the eye, so you have to be very delicate when suturing," Dr. Trief says. Children also heal faster than adults, which has the down side of requiring that they must be brought back to the operating room to have stitches removed surgically.

There is also a very short window for surgical intervention in young children. "The connections between the eye and the brain develop over a critical window in childhood, up until adolescence," Dr. Trief explains. "If a child is born with clouding of the cornea and doesn't receive a corneal transplant until the age of 16, vision will be very poor even if the cornea itself looks fine, because the connections between the eye and the brain never really formed."

Danielle Trief, MD, MSc with patient.

Dr. Trief's commitment to pediatric vision care dates back to her youth. While growing up in Tenafly, New Jersey, she frequently volunteered with visually impaired children at what was then the Jewish Guild for the Blind (which merged in 2013 with Lighthouse International to become the Lighthouse Guild), where her mother served as principal of the preschool. "Although I didn't enter medical school intending to do anything related to vision, it was always a part of who I was because of that experience," she says.

During her end-of-year clinical rotations as a third-year medical student at Columbia University College of Physicians and Surgeons, Dr. Trief assisted with a cataract surgery performed by Professor of Ophthalmology James Auran, MD—and discovered her passion. "I just thought it was so beautiful and such a tangible thing, to take someone who can't see well and give that person vision and improve his life." ■

Drs. Silverman and Zhang Awarded Tenure

Columbia's Department of Ophthalmology now boasts nine tenured professors, as Ronald Silverman, PhD, Professor of Ophthalmic Science (in Ophthalmology) and Xin Zhang, PhD, Jules and Doris Stein Research to Prevent Blindness Professor and Associate Professor of Ophthalmic Sciences (in Ophthalmology and Pathology & Cell Biology), were awarded tenure in June.

"To be tenured at Columbia University is not only a huge honor, but it's a recognition of a faculty member's place in the academic world and his or her achievements to date," says G.A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor and Chairman of the Department of Ophthalmology. "These two scientific investigators have made major contributions in their respective fields. Receiving tenure is an acknowledgement that they have contributed through laboratory research, publications in top tier journals, educational programs for students, residents, fellows, and clinician-scientists, and as leaders in national and international societies. It recognizes that they are the whole package."

Ronald Silverman, PhD

An expert in ophthalmic applications of ultrasound, Dr. Silverman came to both ophthalmology and ultrasound research later in his career, having worked as a biochemistry technician while earning his master's degree in bioengineering and a doctorate in computer science, specializing in non-linear signal- and image-processing. For nearly three decades, he worked in the ophthalmology department at Weill Cornell Medical College with Department Chair D. Jackson Coleman, MD on diagnostic and therapeutic ultrasound research. In 2010, he moved to Columbia, where he was joined two years later by his mentor, Dr. Coleman, who is today a Professor of Ophthalmology at CUMC.

Dr. Silverman is funded by the National Eye Institute for his work in developing ultra-fast plane wave imaging, a tool for structural imaging of the eye that offers 10,000 images per second, compared with the ten images per second available with standard ultrasound. "This technology allows us to see structures within the hidden layers of the eye and is particularly useful in imaging and measuring blood flow, giving it a number of possible applications," he says. "We are using this tool to study blood flow in both normal and glaucomatous eyes. Another clinician in the department is interested in using ultra-fast plane wave imaging to assess blood flow in front of the eye following muscle surgery, while yet another wants to use it in studying ocular tumors and vascular malformations."

After studying molecular biology in graduate school, Dr. Zhang found himself particularly fascinated with the development of the eye. "For humans, vision is probably our most important sense. Eye disease is so common, particularly among the aging population, and I was drawn to the field because there is so much that we can offer to help our patients," he says. A developmental geneticist whose research focus is on ocular development in health and disease, Dr. Zhang has concurrent Research Project Grants (R01s) from the National Institutes of Health.

Among his current projects is the so-called "eye in a dish," which manipulates pluripotent embryonic stem cells to generate ocular structures *in vitro*. "We are especially interested in a peripheral retinal structure called the ciliary body and are starting to see ways in which we can generate those structures," Dr. Zhang says. "The ciliary body can be lost due to injury, such as trauma in accidents or in combat, and there is currently no treatment for that kind of injury. We are very hopeful that our basic research can guide us to a way to generate those necessary tissues and develop a treatment."

In addition to Dr. Silverman and Dr. Zhang, the other tenured professors in the Department of Ophthalmology include:

Rando Allikmets, PhD, William and Donna Acquavella Professor of Ophthalmic Sciences (in Ophthalmology and Pathology & Cell Biology) and Research Director, Edward S. Harkness Eye Institute

Past Chair Stanley Chang, MD, K.K. Tse and Ku Teh Ying Professor of Ophthalmology

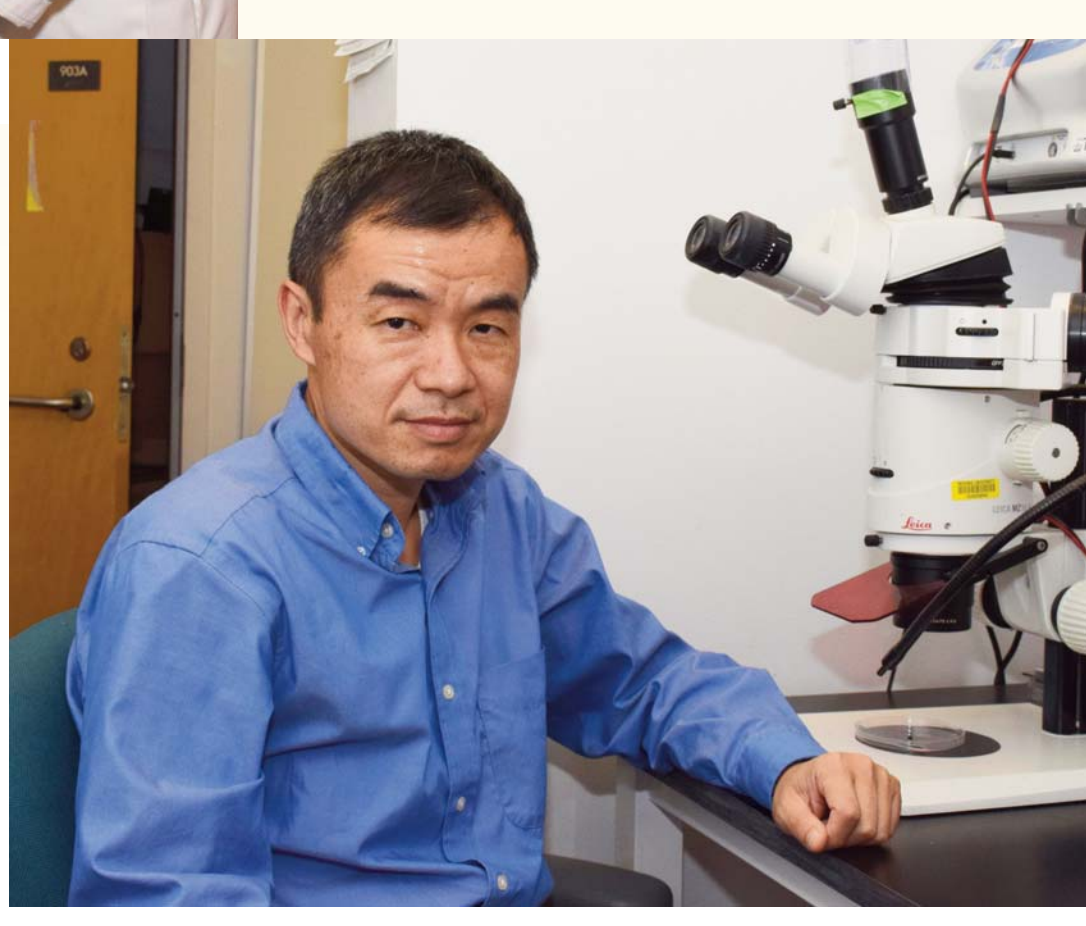
G.A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor and Chairman of the Department of Ophthalmology

Peter Gouras, MD, Professor of Ophthalmology

Department Vice Chair Jeffrey Liebmann, MD, Shirlee and Bernard Brown Professor of Ophthalmology and Glaucoma Service Director

Janet Sparrow, PhD, Anthony Donn Professor of Ophthalmic Sciences (in Ophthalmology), and Professor of Pathology & Cell Biology

Stephen H. Tsang, MD, PhD, Laszlo T. Bito Associate Professor of Ophthalmology and Associate Professor of Pathology & Cell Biology



Xin Zhang, PhD

Research Spotlight:

Columbia Ophthalmology Champions National Research Initiative for *All of Us* Research Program

Image courtesy of the National Institutes of Health

The Department of Ophthalmology is recruiting participants for a groundbreaking nationwide study that aims to enroll one million or more people in order to accelerate medical research and improve health. Sponsored by the National Institutes of Health, *All of Us* Research Program is not focused on any single specific disease or community; instead, it will serve as a national research resource to inform thousands of studies, covering a wide range of health conditions. By taking into account individual differences in lifestyle, environment, and biology, researchers will identify paths toward making precision medicine an everyday reality.

The unprecedented scale and scope of *All of Us* will facilitate research for both common and rare diseases as well as improving understanding of disease prevention. It will also have the statistical power to identify connections between health outcomes and various environmental or biological factors.

Patient enrollment for *All of Us* is being driven by ten university-based consortia across the country, with Columbia University Medical Center leading the New York City Consortium. Over the next five years, Columbia and its NYC partners aim to enroll as many as 150,000 patients in the project, according to David Goldstein, PhD, Director of the Institute for Genomic Medicine, John E. Borne Professor of Genetics and Development, and Principal Investigator of the Consortium. To jump-start efforts toward reaching that audacious goal, several departments at Columbia have been identified as key champions and clinical partners, and the Department of Ophthalmology was one of the first to sign on.

"*All of Us* fits exactly with the paradigm that our department has established with Precision Ophthalmology™," says G. A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor and Chairman of the Department of Ophthalmology. "A number of steps are needed for us to have meaningful and actionable clinical data regarding genomic information. It is essential to develop such a huge database so that we know what the 'normal' population looks like and use the opportunity to compare when we see variations from that normal."

In order to ensure that the benefits of precision medicine—improved diagnosis, treatment, and disease prevention—are available to everyone, *All of Us* has prioritized the recruitment of a diverse population of participants from all races, cultures and socioeconomic backgrounds. The Department of Ophthalmology is ideally positioned to help achieve that goal, says Dr. Cioffi. "We see patients from all walks of life and of all ages, and we have long-term relationships with most of them."

Participants in *All of Us* will be asked to contribute information about their medical history and lifestyle; they may be asked to have their physical measurements taken (such as blood pressure, height and weight), and to donate a blood and urine sample. The program is committed to giving people back their own data, so anyone who participates in *All of Us* will have access to their own study results as well as summarized data from across the program.

"The NIH wants this data to be as available as possible, not just to university researchers. The agency is trying to engage citizen scientists and facilitate participant involvement and feedback in the research questions that are proposed," says Louise Bier, Director of Genetic Counseling and Clinical Engagement at the Institute for Genomic Medicine. "Community outreach and partnerships are a key component of the program. Some information is obviously very sensitive, so there are standards and protections in place to make sure that privacy is appropriately respected."

The program is open to people, healthy and sick, from all communities, and Dr. Cioffi has already taken the lead in enrolling a number of his own patients to participate. "On September 7th , the first morning we started recruiting in the clinic, we had five patients interested within the first hour," he says. "I wanted to start with my own patients, to set an example for the department and work out any kinks in the process before we asked the rest of the faculty to participate."

That approach is exactly what the program needs, says Dr. Goldstein. "*All of Us* depends on very strong clinical engagement; we couldn't possibly recruit this many patients without that. We really need clinical champions who believe that valuable data will be generated by this program and who share that enthusiasm with their patients. When that support comes from a department chair, it's very powerful."

Dr. Cioffi believes that the *All of Us* partnership will help to forge closer ties between the Department of Ophthalmology and the other departments in the medical center, such as the Institute of Genomic Medicine. "My observation has been that ophthalmology programs can become distant from the medical school and other departments, and I think that's to the detriment of the field," he says. "Many systemic diseases have a bearing on eye health, and the eye has a bearing on many systemic diseases. By championing an effort like *All of Us*, we will be a 'good university citizen,' and we will accelerate vision research and vision care with closer relationships to our colleagues in genetics, bioinformatics, and other departments."

More information about *All of Us* is available on the NIH website at **allofus.nih.gov** and **Joinallofus.org/NYC**

Faculty Spotlight:

New Administrative Director to Support Jonas Children's Vision Care

Lisa Hark, PhD, RD, an experienced program director, has joined the Department of Ophthalmology as Professor of Ophthalmic Sciences. Dr. Hark will use her extensive experience and expertise to help build and grow the many components encompassed within the newly launched Jonas Children's Vision Care initiative at Columbia University Medical Center. Supported by generous funding from the Barbara and Donald Jonas Family Fund and the Columbia University Medical Center Department of Ophthalmology, this ambitious initiative brings together the collaborative efforts of physicians, scientists, educators, and advocates to address the key issues that affect children's vision. Its ultimate goal is to ensure that children are able to lead healthy lives, with clear vision.

Dr. Hark's new position at Columbia is a homecoming of sorts, as she received her master's degree in human nutrition from the Columbia College of Physicians and Surgeons in 1988 before earning a doctorate in education at the University of Pennsylvania. Her professional career has been marked by continued productivity, innovation, and accomplishment. Prior to transitioning into ophthalmic research and program development, she directed the nutrition education program at the University of Pennsylvania School of Medicine for nearly 15 years. She then joined the Wills Eye Hospital in 2009, where she directed their Department of Research, the Glaucoma Research Center, and the Wills Vision Research Training and Mentoring Program for medical students.

In 2011, Wills Eye Hospital was funded by a private foundation to develop a program aimed at improving vision screening and access to eye care for underserved children in Philadelphia. The ultimate goal of the program was to improve literacy levels and academic achievement (60% of children in the Philadelphia School District could not read by 4th grade). Working with Alex Levin, MD, Chief of Wills Eye Pediatric Ophthalmology and Ocular Genetics Service, Dr. Hark created and directed this program, which screened more than 35,000 children in the city over four years.

Here at Columbia, Dr. Hark will join Stephen H. Tsang, MD, PhD (Research Director for Jonas Children's Vision Care) and Steven E. Brooks, MD (Medical Director for Jonas Children's Vision Care) to launch the many programs that the initiative supports. "We are focused on bringing national and international recognition to this comprehensive referral center for children. We have the capability and expertise to manage all types of ocular conditions affecting children, across all ophthalmic specialties, including rare hereditary disorders that affect the eyes," she says. "I will be responsible for helping to support and build the many different facets of the initiative, and to establishing Columbia as the preeminent place for pediatric eye care and research."

Dr. Hark also wears a second hat in the Department of Ophthalmology as co-director of the Clinical Trials Unit, along with C. Gustavo De Moraes, MD, MPH, Associate Professor of Ophthalmology. During her tenure at Wills, Dr. Hark developed a broad range of experience with both industry-funded and investigator-initiated clinical trials, including study design, grant writing, data analysis, managing clinical research coordinators, and serving as a co-investigator.

Lisa Hark, PhD, RD

"Clinicians who have a heavy clinical case load and surgical schedule may not have the time to design studies or write protocols and grant applications," she says. "I'll be able to alleviate some of that burden by helping to obtain grants, submit manuscripts, and integrate fellows, residents, and medical students into projects."

The move back to New York is a win-win for her family, says Dr. Hark, who has two children, one of whom just graduated from George Washington University while the other is a freshman at the University of Massachusetts in Amherst. For the past ten years, she's maintained a home in Philadelphia and commuted back and forth to New York, as her husband is a medical professor at the City University of New York School of Medicine. She's delighted to be back in her apartment in Washington Heights, where she regularly bikes and hikes around Fort Tryon Park and Central Park. "It's wonderful to be back in New York and work closely with such a wonderful faculty," she says.

Transforming Cataract and Corneal Surgery

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low levels of astigmatism with custom incisions on the cornea," says Dr. Suh. "The FS laser can pre-soften the cataract as well, meaning that less phacoemulsification energy is used to take the cataract out, making recovery potentially easier."

Our patients have access to the latest artificial lens implants, also known as intraocular lenses, including toric lenses to correct corneal astigmatism that can remain after removal of the cataract, as well as multifocal lenses which offer good distance and near vision and can make a person less reliant on glasses. Not all patients are candidates for multifocal lenses, Dr. Suh cautions; for example, individuals with other conditions, such as glaucoma, retinal conditions, or severe dry eye, would have suboptimal vision quality with a multifocal implant. Finally, insurance also typically does not cover toric or multifocal lenses.

Transforming Corneal Surgery

The cornea is the transparent, front lining of the eye and must be clear to allow for optimal vision. The health of the inner lining of the cornea, called the endothelium, is vital to maintaining corneal clarity. When only the corneal endothelium is affected by a disease process, patients have corneal swelling or edema, the leading cause for corneal transplantation. Now, surgeons may opt for a procedure called an endothelial keratoplasty, which involves selectively transplanting only the affected area. "We just treat the inner lining of the cornea. This approach offers faster recovery and better visual acuity than the traditional full-thickness transplant," Dr. Suh explains. "Patients who receive this type of transplant will probably start seeing within two weeks, as compared to the approximately six months required to stabilize with a traditional transplant." The Cornea Service at Columbia now provides two different methods of endothelial keratoplasty, Descemet's Stripping Automated Endothelial Keratoplasty (DSAEK) and Descemet's Membrane Endothelial Keratoplasty (DMEK).

Columbia is also a leader in other types of corneal surgery. In 2008, the department became one of the first centers in North America to perform corneal collagen crosslinking to treat keratoconus, a condition in which the normally round cornea thins out and develops a bulge that resembles a

Entrance to the new third-floor facility.

A Laser Focus on Vision Correction at 880 Third Avenue

Access to the latest vision correction technology, along with general and specialized optometric care is now available at a convenient midtown location in Columbia's new Refractive Surgery Suite in the Gloria and Louis Flanzer Vision Care Center at 880 Third Avenue, which officially opened in the spring. These services were previously located at the Eye Institute's main building on the Columbia University Medical Center campus.

"Our space on the third floor is dedicated to the cornea and refractive surgery and optometry services, as well as to oculoplastics, and has been optimized for our specialties with the latest diagnostic and treatment modalities," says Leejee Suh, MD, Miranda Wong Tang Associate Professor of Ophthalmology and Director of the Laser Vision Correction Center as well as the Cornea and Anterior Segment Service.

The laser vision center offers state-of- the-art vision correction lasers for LASIK and PRK, including the Intralase Femtosecond laser and the VISX S4 Excimer laser, which incorporates Wavefront-guided treatments that allow for more accurate and precise results and also 3D ActiveTrak™ technology to automatically follow the tiniest eye movements and reposition the laser to ensure accuracy.

Appointments for all services in the Laser Vision Center can be made by calling **(212) 305-9535** or via email at **columbialasik@columbia.edu**.

In the same location, optometrist Suzanne Sherman, OD, FAAO, Instructor in Optometric Science, offers medically necessary and complex contact lens fitting. "Patients who qualify for these difficult contact lens fits are those with ocular surface disease, cornea scarring, severe dry eye, corneal dystrophies, and those who've had corneal transplants," Dr. Suh explains. "These situations require the expertise of Dr. Sherman."

Dr. Sherman is the only optometrist in New York City, and one of only a handful in the tri-state area, certified as an EyePrint Practitioner, meaning that she can prescribe the latest in specialty contacts, the EyePrintPRO™. This prosthetic scleral cover shell improves vision by creating a new, smooth, refractive surface for the eye. Unlike standard contact lenses, the EyePrintPRO™ can match the exact contour of any eye, even in highly difficult conditions when other options have failed. ■

Above: Dr. Suh performs a LASIK procedure.
Right: Dr. Sherman uses the LipiFlow machine.

Relief for Dry Eyes

Dry eye disease is one of the most common conditions affecting the eye, with about one out of every four patients who seek ophthalmologic care reporting dry eye symptoms. (SOURCE: ncbi.nlm.nih.gov/pmc/articles/PMC2720680/)

Chronic dry eye occurs when the tear film that keeps the eye moist and lubricated becomes unstable and loses its natural protective qualities. One of the primary causes of dry eye is dysfunction of the meibomian glands, which produce the lipid layer of the tear film, which is seen in the condition of blepharitis, or inflammation of the eyelid margin. "If the lipid layer is unstable, the tear film breaks down and evaporates more quickly," says Dr. Sherman.

"Many of our patients who have dry eye also have blepharitis," Dr. Suh adds. Blepharitis is particularly common in patients who use eye drops for glaucoma and those with skin conditions like rosacea.

The LipiFlow Thermal Pulsation system, an effective treatment for meibomian gland dysfunction, has recently become available at Columbia Ophthalmology's 880 Third Avenue location. This treatment takes less than 15 minutes and is virtually painless, applying heat and gentle pressure to the inner eyelids in order to release the lipids needed to produce natural tear film. In a clinical study, 79% of patients reported improved overall dry eye symptoms within four weeks of treatment.

"The system uses a vectored thermal pulse technology to deliver the maximum amount of heat and a little bit of pressure to the inner eyelids, in order to 'express' the glands and break up what is clogging them," Dr. Sherman explains. She notes that most patients report decreased dry eye symptoms for about six months to a year following a single treatment.

cone. With one of the largest sets of outcomes data on the procedure, our investigators are exploring shorter protocols for the treatment that appear to provide more comfort for the patient, with equal effectiveness.

As we reported in the Fall 2016/Winter 2017 issue of *Viewpoint*, David Paik, MD, Assistant Professor of Ophthalmic Science (in Ophthalmology), is studying crosslinking treatments using topical drugs based on an array of some 60 compounds commonly used as cosmetic preservatives. "These compounds are known to have anti-microbial and anti-fungal properties, and since they are widely used at low concentrations in cosmetics, they are known to be safe and non-toxic," Dr. Paik says. He and Dr. Suh are now in the process of designing a clinical trial to assess the long-term effectiveness of these agents in stabilizing keratoconus.

The compounds have also shown promise in stabilizing corneal infections. "Effective treatments for corneal infections are becoming an important area of focus due to the emergence of antibiotic-resistant forms of Staphylococcus aureus, Enterococcus, and Pseudomonas," says Dr. Paik. "It appears that the compounds can not only directly kill bacteria and fungus, but they can also prevent the further spread of infection by modifying proteins in the tissue."

With such revolutionary medical and surgical treatments for corneal diseases now available, our patients have more options than ever before to maintain and improve their vision. ■

Instructions for the August eclipse.

One Million Hits!

As eclipse fever gripped the country in August, with a total solar eclipse crossing the entire country coast-to-coast for the first time since 1918, the Department of Ophthalmology anticipated an enormous demand for online information about how viewing the eclipse could affect vision.

On Monday, August 21, the day before the eclipse, a public service announcement developed by Jeffrey Liebmann, MD, Professor of Ophthalmology and Glaucoma Service Director, and G.A. (Jack) Cioffi, MD, Jean and Richard Deems Professor, Edward S. Harkness Professor and Chairman of the Department of Ophthalmology, brought record traffic to Columbia's website. Nearly one million visitors came to the CUMC Newsroom to read information about how to safely view a solar eclipse, and to watch a two-minute educational video featuring Tongalp Tezel, MD, Chang Family Professor of Ophthalmology and Director of the Vitreoretinal Division.

"Many people will think it's safe to take a selfie with the eclipse in the background because they aren't looking directly at the sun," warned Dr. Tezel in the online article. "What they may not realize is that the screen of your phone reflects the ultraviolet rays emitted during an eclipse directly toward your eye, which can result in a solar burn."

The video itself was viewed nearly 100,000 times, and both the online article and video were linked and mentioned repeatedly by major online and broadcast media. The CUMC newsroom article was also shared on Facebook more than 140,000 times.

On August 22, the day after the eclipse, Dr. Cioffi and past Chair Stanley Chang, MD, K.K. Tse and Ku Teh Ying Professor of Ophthalmology, provided expert advice for people worried about their eyes after the eclipse in a *New York Times* feature article. Glancing at the eclipse for less than a few seconds and then looking away probably did not do any significant damage, but looking repeatedly could have caused problems because the effects of damage to light-sensing nerves are cumulative, Dr. Cioffi said. He advised anyone with concerns to visit an ophthalmologist for an assessment of any possible damage. ■

Important Patient Care Information

Specialties:
Cornea/External Ocular Disease
Glaucoma
Pediatric Ophthalmology and Strabismus
Refractive Surgery/LASIK
Vitreoretinal and Uveitis

For inquiries and appointments, please call **212.305.9535**

Viewpoint

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