

F.Y. eye

A SEMI-ANNUAL NEWSLETTER



Finding new ways to protect and heal the cornea

The eye is known as the window to the body, and the cornea is known as the window to the eye. The clear outer layer at the front of the eye helps focus light, and as the outer-most structure of the eye, it's vulnerable to damage.

"The cornea is crucial to sight. Anything that traumatizes or damages the cornea can lead to very dramatic and rapid vision loss, because it's the first gateway through which light comes into the eye," said Winston Chamberlain, M.D., Ph.D., Petti Professor of Ophthalmology at the Casey Eye Institute.

Elevating the art of cornea repair

Clinicians in Casey's cornea division specialize in the diagnosis, treatment and management of a wide range of corneal conditions, from direct injuries to blinding genetic conditions. One of the most transformative treatments for corneal disease and abnormalities is corneal transplantation, a surgery that replaces a poorly functioning cornea with a donated cornea. Corneal transplantation can save or restore sight for patients.

"It's quite remarkable how much reconstruction we can do in this part of the eye versus other parts of the eye. We can restore most, if not all the function to the eye. That's one of the reasons I picked this subspecialty. We can get fantastic outcomes, and are often able to give patients their lives back," said Chamberlain.

Dr. Chamberlain is a top corneal surgeon, performing more than 100 transplants a year, and serves as chair for the



“It’s quite remarkable how much reconstruction we can do in this part of the eye... We can get fantastic outcomes, and are often able to give patients their lives back.”

– Dr. Chamberlain

(continued from cover)

medical advisory board for the Eye Bank Association of America. He’s among the Casey faculty who are developing new, more effective surgical techniques that only require replacing one layer or section of the cornea, instead of the entire organ.

Thanks, in part, to clinical trials taking place at Casey, eye surgeons are now more likely to use a technique called single posterior layer transplant during corneal transplantation. Casey faculty are also pioneering a corneal transplant technique known as sutureless interlamellar keratoplasty (SILK) for addressing corneal ectasia, a condition that weakens the inner layers of the cornea.

The evolution of corneal transplantation

In a joint study with Stanford University and the University of San Francisco, called The Descemet Endothelial Thickness Comparison Trial (DETECT), Casey researchers compared the effectiveness of two distinct types of corneal transplantation and found that patients who received the thin layer transplant (referred to as DMEK) saw more significant improvement in their vision.

“In patients who had the thin layer transplant (DMEK), we saw improvements in vision even beyond what you can measure in a visual acuity chart – like their ability to see contrast – and they recovered faster. These thin layer transplants allowed them to get their vision back to normal at a faster rate, which is huge,” said Chamberlain, who was the co-author and co-designer of the study.

Building on success

Casey recently received funding from the National Eye Institute for a second DETECT study, bringing in a larger study population and adding a new element: testing the efficacy of Ripasudil eye drops. Chamberlain’s hope is that the new drugs could help transplantation patients recover faster and allow the grafts to survive longer. The new study will start recruiting patients in the fall of 2022 and involve at least five clinical sites.

Better images, smarter diagnosis

Optical coherence tomography (OCT), pioneered by Casey’s associate director David Huang, M.D., Ph.D., has been a game changer for every field of ophthalmology, and the cornea is no exception.

Using the power of OCT, Yan Li, Ph.D., associate professor of ophthalmology, and colleagues are developing a protocol to image and track subtle changes in every layer of the cornea very early in corneal endothelial disease. OCT creates increasingly clear images of the cornea’s thickness and shape, and artificial intelligence (AI) makes it possible to distinguish subtle abnormal patterns not visible to even the most skilled ophthalmologist. The combination significantly increases diagnostic accuracy.

“Clinical diagnosis can be subjective, and there can be biases between one doctor and another. Imaging data gives us objective facts,” said Dr. Li.

These new capabilities make it possible to track patients with early signs of problems, and start treatment early with the least invasive options. What’s more, spotting issues early can often prevent the need for transplantation later on.

Human v. computer

Travis Redd, M.D., M.P.H, assistant professor of ophthalmology, and his team taught a computer (using AI technology called convolutional neural networks, CNN) to use specific visual markers to distinguish between photographs of bacterial keratitis and fungal keratitis (aka corneal ulcers). These related conditions are notoriously hard to distinguish.

Corneal ulcers are caused by a fungal or bacterial infection in the cornea, often due to an injury to the eye or contact lenses. If left untreated, it can lead to blindness. The two types of infections require very different treatments.

A Grand Opening, At Last

Redd's team asked study subjects to take a smart phone picture of their affected eye, and send it in for analysis. They sent the images to the computer lab and to a team of 12 cornea experts.

The CNNs were 81% accurate in diagnosing fungal ulcers and 75% accurate in diagnosing bacterial ulcers. Humans were better at pinpointing bacterial ulcers (88%), and significantly less accurate predicting fungal ulcers (56%).

"These findings could make a major impact on our ability to prevent blindness, globally," said Redd.

Corneal damage is the 5th leading cause of blindness globally, and especially prevalent in less developed countries. As researchers and clinicians at Casey improve their ability to identify, heal and repair corneal damage, they are working towards stopping a significant percentage of preventable blindness here at home and, eventually, worldwide.

On October 8 the Casey community and the Oregon State Elks Association were finally able to celebrate the grand opening of the Elks Children's Eye Clinic (ECEC) building on Marquam Hill. Over a hundred people gathered on a beautiful fall day for the long-anticipated event. The culmination of many years of planning, fundraising and building, the new facility is the first free-standing children's eye clinic in the nation. The ECEC officially opened in 2020 but, due to the Covid-19 pandemic, the clinic could only open its doors to staff and patients until now.

The Grand Opening was a celebration of the historic facility, an occasion to celebrate the incredible role the Oregon State Elks Association have played in Casey's success for over 70 years, and in recognition of the Oregon Elks' significant philanthropic investment of \$20 million for the ECEC.

"I have always been impressed by how much the Elks care about each and every child. They love to hear patient stories, and how our clinic was able to make their lives better. What drives them is a love of helping children. That's a really beautiful thing to celebrate,"

2022 Faculty Awards and Recognitions



Andreas Lauer, M.D., was appointed director for Casey Eye Institute.

David Wilson, M.D., received the Preuss Distinguished Alumni Award from the OHSU School of Medicine.

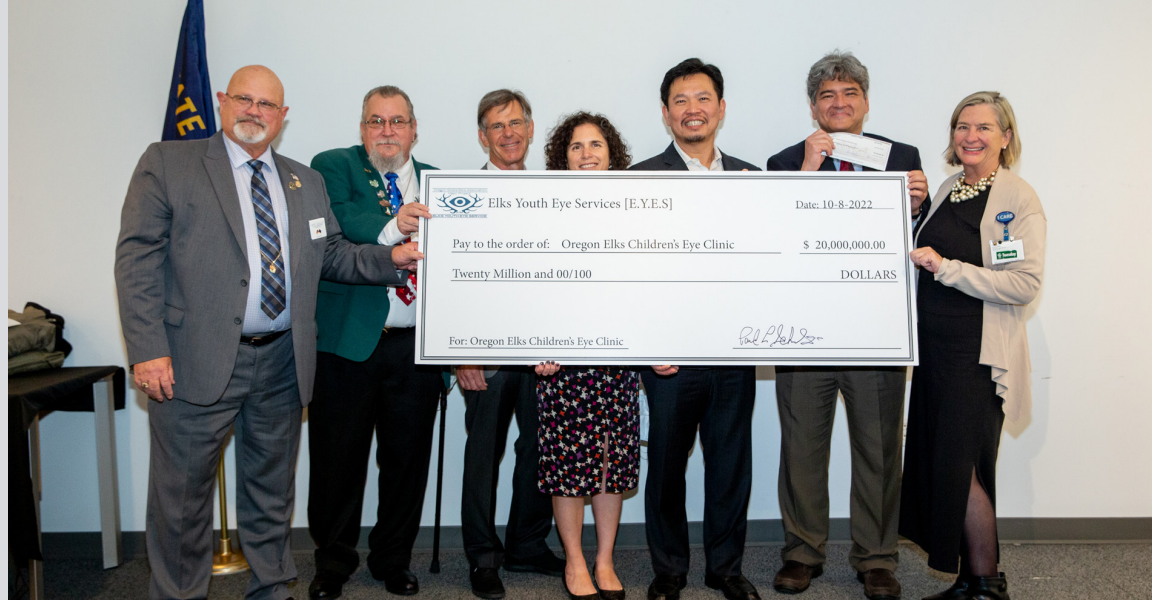
Mitchell Brinks, M.D., M.P.H., was the recipient of the inaugural Visionary Award at the 2022 Global Ophthalmology Summit.

Yali Jia, Ph.D., was named a 2022 Biomedical Innovation Program awardee in the Device, Diagnostic and Software category and was elected to the National Academy of Inventors.

Daniel, Tu, M.D., Ph.D., was appointed as Residency Program Director.



Members of the Oregon State Elks Association present a check to Casey Eye Institute to complete their \$20 million donation to the Elks Children's Eye Clinic building. Left to right: Lanny Schultze, Ben Adams, Dr. David Wilson, Dr. Leah Reznick, Dr. David Huang, Dr. Andy Lauer, and Joannah Vaughan.



said Leah Greenhill Reznick, M.D., director of the Elks Children's Eye Clinic.

The event featured festive food and drink, clinic tours, and a formal program that included remarks from David Wilson, M.D., Andy Lauer, M.D., and Lanny Schultze, EYES President. Lanny presented a check to complete the Oregon Elks donation of \$20 million.

Today, the new 60,000 square foot building is home to a spacious pediatric eye clinic, ROP telemedicine, outreach programs, retina services, vision rehabilitation, the Paul H. Casey Ophthalmic Genetics floor and a clinical trials center.

Joannah Vaughan, M.B.A., founder and director of the Elks Preschool Vision Screening Program at Casey, has developed close ties to the organization over nearly 20 years. She pointed to several examples of the Elks providing seed money to crucial initiatives beyond the ECEC, including \$1 million to start an informatics center, which eventually led to a groundbreaking discovery in using artificial intelligence to diagnose retinopathy of prematurity, and money to start a preschool vision screening program in 2003, which was one of the first in the nation.

"The Elks members are the helpers in our community. These are the people who raise their hands to volunteer. It's great to have them in our corner," said Vaughan.

2022 Faculty Awards and Recognitions

Kate Keller, Ph.D., named a 2022 Silver Fellow by the Association for Research in Vision and Ophthalmology.

Blue Ridge Institute for Medical Research released its 2021 rankings, and OHSU is #9 for NIH funding in ophthalmology

U.S. News & World Report ranked Casey Eye Institute #16 best hospitals for ophthalmology in the country.

Ambar Faridi, M.D., was honored with a Secretariat Award by the American Academy of Ophthalmology.

Afshan Nanji, M.D., and Allison Loh, M.D., received an Achievement Award from the American Academy of Ophthalmology.

Travis Redd, M.D., M.P.H., received the Claes Dohman Fellowship Award from Massachusetts Eye and Ear Infirmary Cornea Center of Excellence.

J. Peter Campbell, M.D., M.P.H., accepts an award for Best Paper at the World Retinopathy of Prematurity Congress.

Faculty leadership in national organizations

Andreas Lauer, M.D., appointed Vice-Chair (2022) and Chair (2023) of the American Board of Ophthalmology.

Julie Falardeau, M.D., named to the Board of Directors of the American Board of Ophthalmology and the Board of Directors of the North American Neuro-Ophthalmology Society.

Winston Chamberlain, M.D., Ph.D., serves the American Society of Cataract and Refractive Surgery as a member of the Corneal Education Subcommittee and serves the Eye Bank Association of America on the Board of Directors as well as chair of the Medical Advisory Board.

Ambar Faridi, M.D., became Co-Chair & Founding Member of the American Academy of Ophthalmology Diversity, Equity and Inclusion Workgroup and a member of the American Academy of Ophthalmology Committee for Resident Education.

Kavita Bhavsar, M.D., became a leader in the Women in Ophthalmology Mentorship Committee.

Travis Redd, M.D., M.P.H., became a member of the American Academy of Ophthalmology Academic Global Ophthalmology Task Force.

FACULTY SPOTLIGHT

Leah Greenhill Reznick, M.D.

Associate Professor of Ophthalmology

Elks of Oregon Pediatric Ophthalmology Professorship

Director, Elks Children's Eye Clinic, Casey Eye Institute, School of Medicine

Director, Faculty Development for Ophthalmology



Pediatric ophthalmologist Leah Greenhill Reznick, M.D., has spent her 15-year career focusing on patient care, improving clinical efficiency and overseeing professional development for Casey faculty.

Now, in her new role as the Director of the Elks Children's Eye Clinic (ECEC), she's excited to take on the ultimate big picture challenge: broadening access to care.

"One of our most important roles is to provide eye care to children who don't live anywhere near an eye clinic. Our goal is to screen children throughout Oregon and Southwest Washington, and to identify and provide the best care to each of them," said Reznick. "Thanks to support from the Oregon State Elks Association and others, we have the resources, the people and the technology to provide the most up-to-date care available to more children."

She's also eager to accelerate the ECEC's ambitious research agenda, and to support the world-class faculty in reaching their goals. "Being a director is a lot about helping the other faculty shine."

"There are so many things I'm eager to push forward," she said. "For example, we're starting to look at new ways to help children with amblyopia [aka lazy eye] stick with their treatment plan. Amblyopia affects two to four percent of children nationwide, and it's a huge problem. Patients who come to their appointment and follow the treatment plan have a huge amount of success. But we know there are tremendous obstacles to follow through with eye care. If we reduce those barriers, we can improve a child's vision for their lifetime."

Reznick is an accomplished teacher, administrator and researcher; but her first love is direct patient care.

"My interest in becoming a pediatric ophthalmologist started when I was a second-year ophthalmology resident. I loved the fact that you could make an early impact on a child's vision, and that it will affect their entire life," said Reznick. "And I enjoyed how you wouldn't just meet once or twice – you could watch a patient grow up and be a part of their whole childhood. Plus, there is so much joy working with children, who are so curious, honest and playful."

Introducing new faculty members



John Davis, M.D.
Pediatric
Ophthalmology
Bend



**Megan
McChesney, M.D.**
Comprehensive
Ophthalmology
Astoria



Paul Nefedov, O.D.
Comprehensive
Optometry
Astoria & Longview



Gillian Paton, M.D.
Neuro-ophthalmology
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