



Stanford
MEDICINE

Byers Eye Institute
Department of Ophthalmology

VISION MATTERS



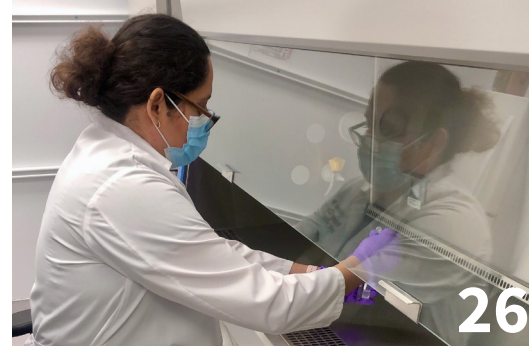
Connecting the World
2020 Annual Report



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VISION MATTERS: 2020 ANNUAL REPORT

Introduction

- 1 A note from our Chair
- 2 Byers Eye Institute by the numbers

Cover story

- 4 Tele-Ophthalmology: Digital care in a digital world

Research and innovation

- 8 Advancing optic disc drusen research: Stanford scientists provide hope

Patient spotlight: Clinical excellence

- 12 From mother to patient: A patient's rare diagnosis plays a pivotal role in a multi-center study
- 14 Young patients receive sight restoring lenses
- 15 Cross-department team effort conquers rare inflammatory eye disease

Focus on philanthropy

- 16 The joy of giving sight: Generous donors fund innovative breakthroughs for retinal diseases
- 17 Vision restoration in glaucoma: A donor's gift accelerates translation from lab to clinic

Our community, our world

- 18 A global career path: Health equity and female empowerment

Education at the Byers Eye Institute: Training for the future

- 20 Pursuing excellence through diversity, equity, and inclusion
- 22 Meet our residents and fellows
- 24 The Byers Eye Institute team: A global map

Research and innovation

- 26 Advancing clinical research in the age of COVID-19
- 28 Improving ophthalmologic care through artificial intelligence
- 30 Solving corneal blindness with implantable video technology
- 32 Awards and honors

Faculty and Specialties

- 34 Meet our department faculty

Editor-in-chief Kathryn Sill

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A note from our Chair



This historic year of 2020 marked my fifth anniversary back at Stanford. The unexpected outbreak of the novel coronavirus (COVID-19) pandemic brought fear and uncertainty to our community. These were amplified by the increased recognition of systemic racism and inequality. But, even in the midst of these uncertain times, I was encouraged as I witnessed our faculty, residents, fellows, and staff come together to ensure the safety of our patients, our employees, and our community. We quickly established protocols to shift to remote work when possible, and on site we implemented new sanitization, mask and PPE, and physical distancing standards. Rather than being impeded by COVID-19, the Byers Eye Institute at Stanford team took the opportunity to rise to these challenges and continued to demonstrate preeminence across all of our missions in clinical care, research, and education.

A few remarkable achievements stood out, including the opening of the Stanford Center for Optic Disc Drusen at the Byers Eye Institute (page 8), aimed at restoring sight for patients facing this difficult disease; continued efforts to support diversity, equity, and inclusion, for example through the Stanford Clinical Opportunity for Residency Experience program (page 20); incorporating innovation and artificial intelligence into ophthalmologic care (pages 4, 28, 30); and accelerating research at the Mary M. and Sash A. Spencer Center for Vision Research at the Byers Eye Institute thanks to the support of a number of generous donors (pages 16, 17, and 26).

As we close a chapter on the year 2020, I am confident that in this next year we will continue to advance our commitment to research, to education, and to providing the highest level of diagnostic and therapeutic care to our patients. While I count it a privilege to witness firsthand these triumphs on a daily basis, I hope that this report will you give insight into a tradition of excellence we seek to uphold.

Thank you to our staff, donors, colleagues, alumni, patients, and community for joining us in this journey as we seek to grow our department of ophthalmology in service to you!

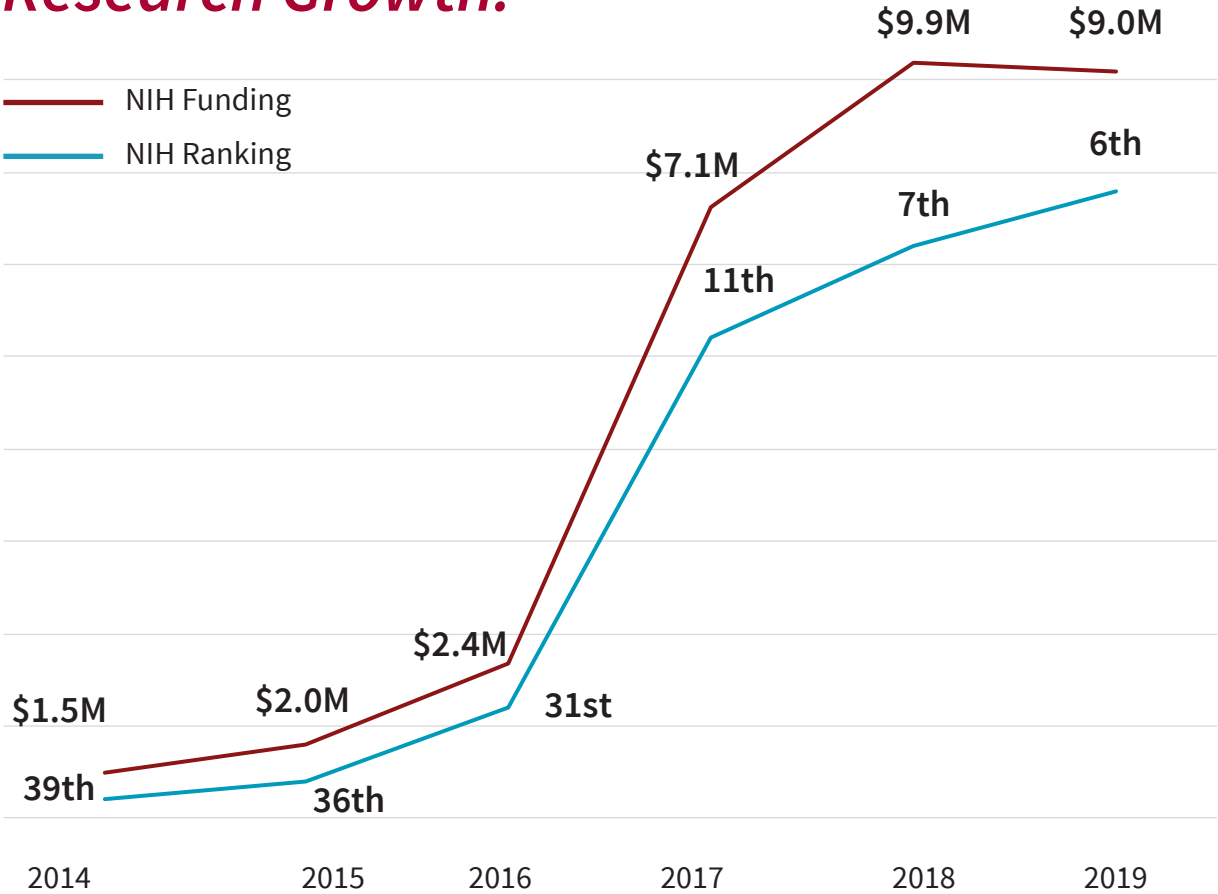
Jeffrey L. Goldberg, MD, PhD

Blumenkranz Smead Professor and Chair of Ophthalmology
Byers Eye Institute at Stanford University

Byers Eye Institute

by the numbers

Research Growth:



Source: Blue Ridge Institute for Medical Research
2020 year-end data pending at time of publication

2020 ACTIVE AWARDS

133

2020 TOTAL NIH AWARDS

30

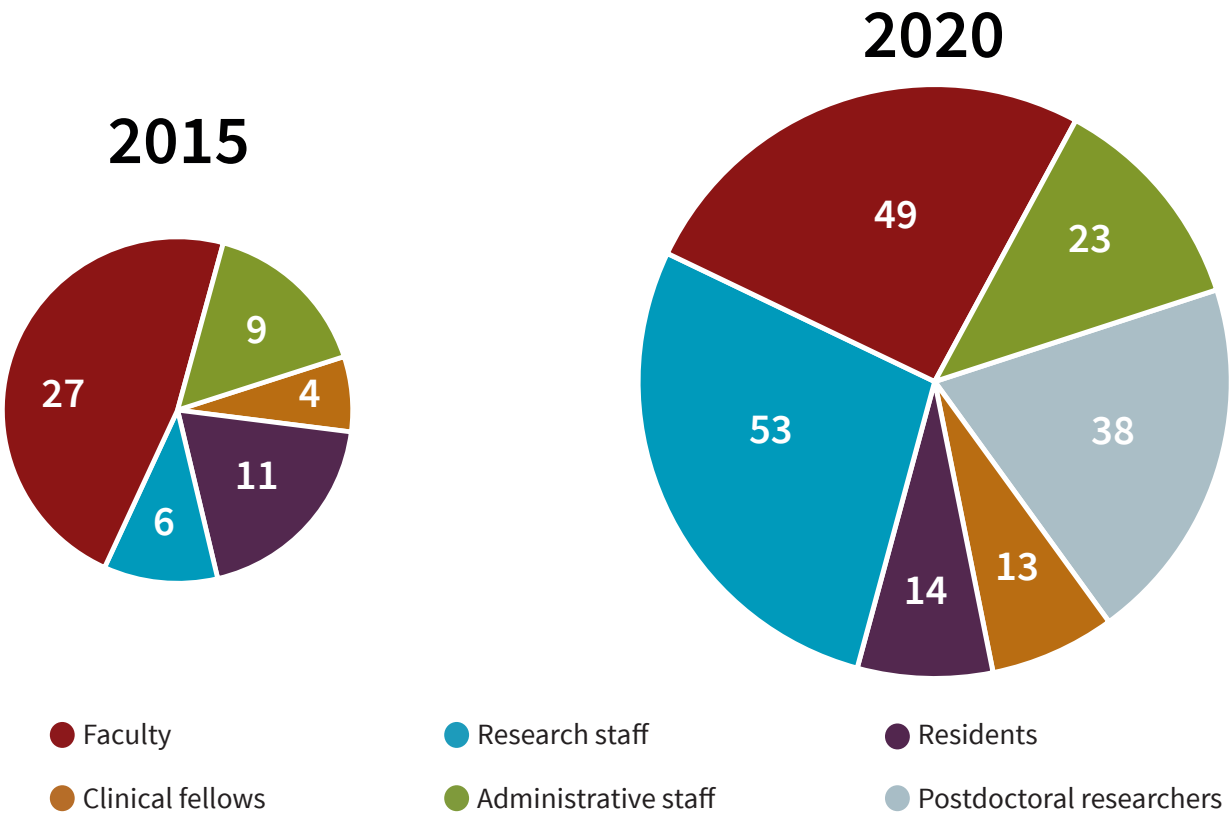
2020 ACTIVE CLINICAL TRIALS

42

2020 PUBLICATIONS

172

Our Team:



Ophthalmology Times

2020 BEST PROGRAMS

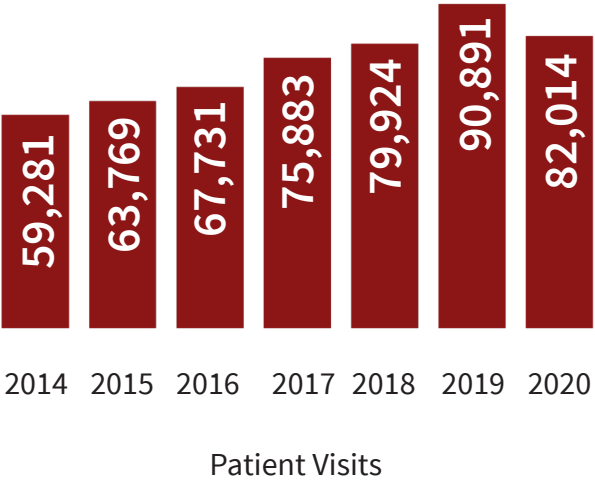
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BEST OVERALL PROGRAM

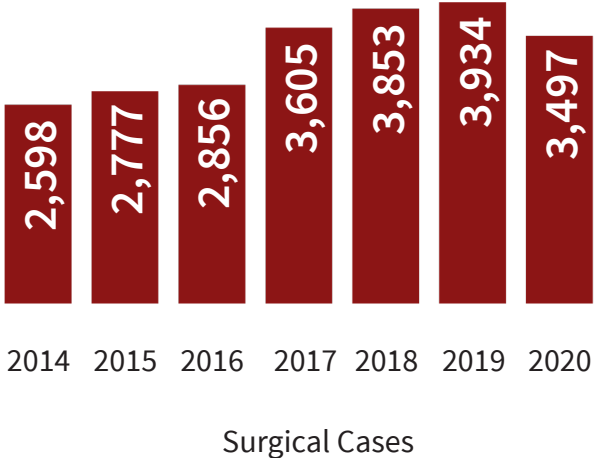
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BEST RESEARCH PROGRAM

In the Clinic:



In the OR:



Tele-Ophthalmology: Digital care in a digital world

Traditionally, medical care has been delivered with the provider and patient in the same room at the same time. In-person appointments are vital to conduct certain aspects of the examination, provide in-office treatments, and develop a connection between the provider and patient, even though it can present travel and time burdens on the patient. This year, however, with the coronavirus (COVID-19) public health emergency compelling providers to keep in-person contact to a minimum, alternative solutions have become even more of a pressing need.

In the same way that video conferencing and mobile technologies have revolutionized personal and business communication, their role in health care has also grown significantly. Stanford has long been leading in the utilization of mobile health innovation, but in the face of the COVID-19 pandemic, faculty and staff have had to speed-up this implementation.

“Outdoor and mobile testing enable patients to obtain *key diagnostic data* and then follow up with a **video visit** with their ophthalmologist. The goal is to provide patients with options that **minimize potential exposure to COVID-19** but also *provide them with the care they need.*”

To address the ever-growing need for better access to eye care, the Byers Eye Institute at Stanford created a comprehensive offering of **“tele-ophthalmology”** digital and online resources for patients to meet short-term needs resulting from the pandemic, and also to accelerate into the post-pandemic future. Luckily, the team at Byers Eye Institute had been anticipating this digital future and had already been deploying state-of-the-art digital care to infants, children, and adults alike.

Newborn screening

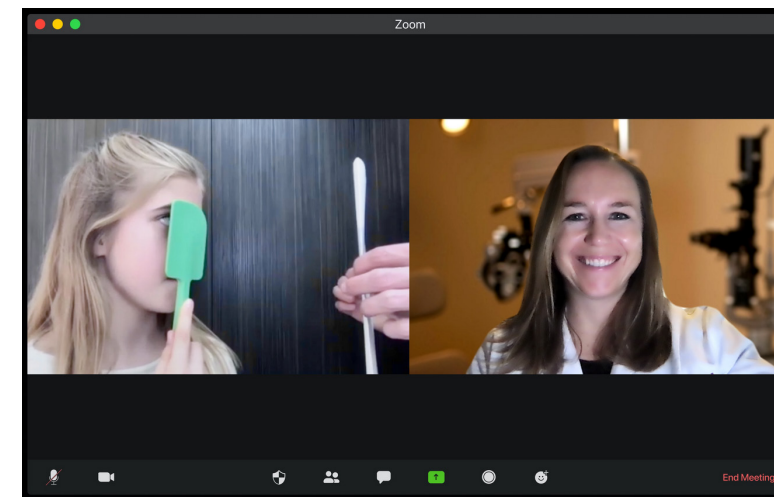
Darius Moshfeghi, MD, professor of ophthalmology and chief of the retina division at the Horngren Family Vitreoretinal Center, has long been dedicated to preventing and treating blindness in premature infants affected by **retinopathy of prematurity (ROP)**, a terrifying disease in which inappropriate new blood vessels grow in and destroy the retina. The main barrier to successful treatment for ROP is actually inadequate access to qualified screening physicians at neonatal intensive care units (NICUs).

To address this need, Moshfeghi founded the **Stanford University Network for Diagnosis of Retinopathy of Prematurity (SUNDROP) program** in 2005, and with that also launched **Stanford’s Tele-Ophthalmology program**, which he directed through 2017. Today, SUNDROP remains the most mature and largest telemedicine program for in-hospital screening of high-risk infants for treatment-warranted ROP in the United States. It has expanded to NICUs at hospitals

throughout Northern California, and has spread to two other states, with a dozen or more NICUs in additional states now looking to engage.

SUNDROP has a proven record of reducing blindness and poor visual outcomes from ROP by providing infants in rural and county hospitals with quaternary-level care. At each site, all infants meeting established criteria are screened using RetCam II images taken by hospital staff.

The advantage of this system is that it provides



Tawna Roberts, OD, PhD (right), examines a child’s vision during a video visit by using a kitchen spatula to perform a visual acuity test one eye at a time. During video visits, common household items can be used to help perform vision tests.

lower cost, high quality care while saving time for the hospital staff, the physicians, and the patient’s family. Moshfeghi has worked with industry partners to develop wide-angle imaging camera technology as well as deep learning classifier platforms for the identification of disease in premature, as well as in healthy term newborn infants. Moshfeghi also serves on the American Academy of Ophthalmology’s Telemedicine Taskforce, which sets practice guidelines for telemedicine for eye care professionals in the U.S.

“The success of the SUNDROP program along with profound changes in imaging and communications technology, regulatory approvals, reimbursement, care guidelines, and patient preferences over the last few years have opened the door to a new paradigm in eye care delivery—one where patient needs can be addressed either remotely, in-person, by a machine, or some combination of these depending on the indication,” Moshfeghi said.

Telemedicine for remote diabetic eye care

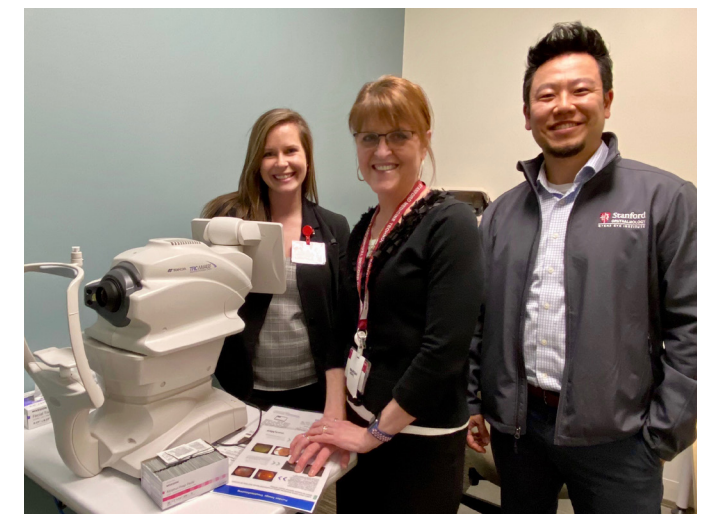
In 2017, Moshfeghi passed the role of Director of Tele-ophthalmology to **David Myung, MD, PhD**, assistant professor of ophthalmology and director of the **Ophthalmic Innovation Program**. Myung’s goal was to expand the tele-ophthalmology offerings at Byers Eye Institute into adult care, starting with diabetic retinopathy screening. He inherited a set of retinal cameras from Moshfeghi, which had been provided by a

donor, and since then has grown what started as a small, one-clinic pilot project into a Bay Area-wide **Remote Diabetic Eye Care Network**.

The development of this program has been a highly interdisciplinary effort several years in the making through close collaboration between Myung and his retina specialist colleagues at Byers Eye Institute, in particular **Theodore Leng, MD, MS**, associate professor of ophthalmology and co-director of clinical and translational research. Together, they marshalled key support and contributions from ambulatory care leadership and staff, and information technology and electronic medical records teams, to bring

an initial pilot to Stanford’s endocrine clinics. Now, their efforts have accelerated the program’s rollout through Stanford’s primary care and affiliated University Healthcare Alliance community clinics. With expansion of the program to a total of six sites, **Vinit Mahajan, MD, PhD**, associate professor of ophthalmology and vice chair for research, joined Leng as a remote reader for the captured retinal images through the **Stanford Reading Center (STARC)**.

“It was an extraordinary team effort to set up a network of eye cameras around the Bay Area that provide diabetic patients with the opportunity to have



David Myung, MD, PhD (far right), on a visit to one of the remote diabetic eye testing sites in Los Gatos on the day the AI-compatible camera was launched. Also pictured (L to R) are project collaborators from Stanford Health Care and University HealthCare Alliance: Megan Hoehn, Senior Project Manager, Ambulatory Systems; and Maureen Wong, Principal Systems Analyst, IT.

COVER STORY



For in-person visits, mandatory masks are worn by physicians and patients. In addition, protective slit lamp shields are used, and surfaces are triple cleaned in between each patient.

photographs taken of their retinas at their regular primary care or endocrinology appointments, and without the need for dilating drops,” Myung said.

The effort has received accolades and support from both **Stanford’s Improvement Capability Development Program** led by **Diana Do, MD**, professor of ophthalmology, and **Stanford’s Value-Based Care initiative** led by **Prithvi Mruthyunjaya, MD**, associate professor of ophthalmology.

“If no damage or progression is seen, then patients can continue to follow-up remotely through this program, typically on an annual basis,” Leng said. “Only patients that are found to have evidence of diabetic damage to their retinas are asked to travel to the Byers Eye Institute for further examination and management.”

Adding artificial intelligence to facilitate tele-ophthalmology

This network of eye cameras now serves as the platform for the newly formed **Stanford Tele-ophthalmology Automated Testing and Universal Screening (STATUS) program**, established with the goal of enabling patients to more easily check the status of their eye health. As the founding director, Myung is implementing Food and Drug Administration (FDA)-approved artificial intelligence (AI) algorithms and digital health technologies to further expand access to eye care. Now, a fully autonomous AI-based image interpretation

algorithm called IDx-DR can read retinal photos and make referral decisions without physician input. Cleared by the FDA, this system is reimbursed by Medicare, and will further boost Stanford’s national quality care metrics for taking care of diabetic patients. These factors set the stage for further expanding the reach of the program by providing exam results and referral decisions to patients immediately while improving workflow and efficiency. Myung is excited about this new paradigm in patient care.

“Leveraging the power of AI for image interpretation provides the option of making routine screenings remote and autonomous, freeing retina specialist colleagues to spend more time with patients who need sight-saving interventions,” Myung said. “Plus, patients get to see their exam results immediately, and can then prioritize the in-person appointments they absolutely should attend while still receiving the care they need.”

The AI-based diabetic eye testing service was launched this year within the Stanford primary care system in Emeryville, to be followed by clinics in Santa Clara and Hoover Pavilion on Stanford campus and at primary care clinics in Los Gatos, Hayward, Oakland, and Pleasanton in early 2021.

Video visits and handheld diagnostics

Prior to COVID-19, **Heather Moss, MD, PhD**, associate professor of ophthalmology and neurology, saw telemedicine as an ideal platform with which to increase access to care and improve patient experience in her



To help with safety precautions during patient visits, resident Jose Davila, MD, designed a small clip that attaches a face shield to an ophthalmoscope to provide extra personal protective equipment during retinal exams.



subspecialty of neuro-ophthalmology. Her nascent efforts included opening a satellite eye imaging center in the **Stanford Neuroscience Health Center** and providing remote image interpretation for neurosurgical and neurological colleagues with specific eye exam questions. During COVID-19, propelled by the need to keep patients and doctors at home while continuing to provide care, Moss led the way in ushering in synchronous tele-ophthalmology appointments at Byers and now directs the Video Visit Program for the department.

Synchronous video visits are accessed via a smartphone application called MyHealth, allowing the patient and provider to see each other. During these video appointments, patients can discuss symptoms, review records sent by their referring provider and ask questions. The physician can perform a limited eye examination including central vision function, peripheral vision, pupils, eye movements, and eye appearance, review in-person testing and discuss management.

Although some subspecialties such as neuro-ophthalmology and oculoplastics are able to heavily utilize video visits (for example, a number of eyelid disorders and neurological disorders impacting vision and eye movements can be evaluated via initial video consultation), other subspecialists need at least some

Wen-Shin Lee, MD, established innovative visits wherein patients had a vision check and intraocular pressure measurement from the comfort of their car. Combined with a video visit with their eye doctor, these visits minimized person-person contact while collecting the essential information necessary to allow ongoing management of glaucoma during the pandemic.

diagnostics that can only be gathered in person. And so, in response to COVID-19, the Byers Eye Institute faculty and staff setup outdoor curbside diagnostic visits.

“Outdoor and mobile testing enable patients to obtain key diagnostic data and then follow up with a video visit with their ophthalmologist,” said **Wen-Shin Lee, MD**, clinical assistant professor of ophthalmology and a glaucoma specialist. “The goal is to provide patients with options that minimize potential exposure to COVID-19 but also provide them with the care they need.”

In other telemedicine efforts spanning from local nursing homes to villages in rural Nepal, Myung and colleagues have also been able to implement handheld ophthalmic digital health technologies such as smartphone-based cameras and visual acuity tests that further expand access to eye care.

Together, faculty are leading the Byers Eye Institute in what is now arguably the nation’s leading and most comprehensive center for ophthalmologic telemedicine. “The technology we have in the pipeline has so much potential—remote testing, handheld imaging, and AI algorithms—we’re already taking steps into a future that might have been unimaginable even as recently as last year,” Myung said.

Scan the QR code to view more information
on telemedicine at Stanford



<https://stan.md/32bsv5m>

Advancing optic disc drusen research

Stanford scientists provide hope

When **Joyce Liao, MD, PhD**, associate professor of ophthalmology and of neurology, came to Stanford in 2006, she began seeing patients with **optic disc drusen (ODD)**, a condition that effects vision and the optic nerve, and was frustrated with how little she could offer them.

In ODD, calcium-containing deposits at the optic nerve head are associated with damaged optic nerve axons. These deposits are present in about 2-4% of the general population, and can lead to irreversible vision loss that can be slowly progressive or sudden in onset.

“ODD typically causes peripheral vision damage in

Liao continued to increase, until finally the evidence became overwhelming: there was a great unmet need to deepen the understanding of the disease, and to start specifically studying its causes and potential for treatments. In 2019 that need was met when a visionary donor provided a \$10 million gift to establish the **Stanford Center for Optic Disc Drusen at the Byers Eye Institute**.

The Stanford Center for Optic Disc Drusen at the Byers Eye Institute

The newly established Center helped unite a premier group of faculty dedicated to investigating optic nerve damage, with the goal of preserving and restoring vision

“**ODD** typically causes peripheral vision damage in patients, and sometimes it also damages the central vision. It is **common enough**, but people **may not realize they have it** until they are seen by an eye doctor.”

patients, and sometimes it also damages the central vision,” Liao said. “It is common enough, but people may not realize they have it until they are seen by an eye doctor.”

ODD, which affects both children and adults, also has a genetic component. There is a 50% chance someone with ODD will pass it onto their offspring—but studies on what genes cause the disease have been lacking.

“There is an urgent need to advance our understanding of optic disc drusen,” Liao said. “Today, more than 150 years after the first description of this disease, we do not know what causes it, or the pathophysiology of how it leads to vision loss.”

Over the years, the number of ODD patients seen by

in patients with ODD. These include investigators who specialize in studies of the retina, optic nerve, and brain, as well as experts in clinical trial design who can help translate findings into novel clinical studies.

“While a number of us had been doing clinical research on conditions related to ODD for some time, establishing the ODD Center has allowed my colleagues and me to significantly deepen our investigation of ODD,” Liao said.

The formative Center gift has allowed Stanford faculty to pursue critical research in human patients and in animal models in parallel. Generating the first ever animal models of ODD is a key step to investigate the pathogenesis of disease and discover effective

therapeutic candidates.

Patient studies will leverage advanced noninvasive imaging and innovative functional measurements invented at Stanford to run a first-of-its-kind comprehensive study of the natural history of the disease, and search for new biomarkers to use in therapeutic trials.

The inaugural Optic Disc Drusen Virtual Conference

With a dual goal of increasing patient outreach for these trials, and for convening worldwide science on ODD, **the ODD Center hosted the first international ODD conference on May 11, 2020**. It was initially planned as an in-person event, but then converted to

virtual, because of the coronavirus (COVID-19) pandemic.

The conference featured nearly 450 participants from 35 countries. It helped galvanize the scientific community’s focus on ODD as attendees explored and shared laboratory and clinical advances, seeded collaborative opportunities, and strategized to further advance the field.

“With the inadequacy of current treatment options for ODD, this conference provided a platform to leapfrog research towards greater understanding and better treatment options,” Liao said. The conference also included ODD patients and their families. “We gave patients a forum to voice the urgency of their experiences with vision loss, and to hear our hope for the future of this research.”



Joyce Liao, MD, PhD, serves as the director of the recently established Stanford Center for Optic Disc Drusen (ODD) at the Byers Eye Institute. ODD is a condition that damages the optic nerve and decreases vision. Photo by Steve Fisch.

RESEARCH AND INNOVATION



The ODD Center is comprised of a premier group of faculty dedicated to investigating optic nerve damage. The clinical human research group includes: **Front row (L to R):** Justin Gardner, PhD; and Anthony Norcia, PhD. **Back row (L to R):** Quan Dong Nguyen, MD, MSc; Yasir Sepah, MBBS; Alfredo Dubra, PhD; Joyce Liao, MD, PhD; Heather Moss, MD, PhD; Tawna Roberts, OD, PhD; Jeffrey Goldberg, MD, PhD; Diana Do, MD; and Brian Wandell, PhD. **Not pictured:** Shannon Beres, MD; Jonathan Lin, MD, PhD; and Edward Wood, MD.

A patient’s perspective: Seeking hope in the ODD journey

Wendy, a patient who shared her personal story during the conference, was diagnosed with ODD nearly seven years ago when in her early 60’s. While in the process of moving from one side of the Twin Cities, Minnesota, to the other, she transferred her care to a new ophthalmologist. During her routine checkup she learned for the first time the shocking news that she had had glaucoma and ODD for some years. Up until that point, she had never even heard of ODD. Wendy had worn glasses and contacts, and had undergone cataract surgery years prior, and yet had never been diagnosed with ODD. Wendy’s new doctor shared that she had the worst case of optic

disc drusen he had ever seen. She left that appointment with eye drops for glaucoma, but still seeking a deeper understanding of ODD and a doctor who could help treat her conditions. “No one could give me any indication about what my future held,” Wendy said. “There was no research and no known cause, and that left me frustrated and worried.” Wendy had led an active life of swimming, biking, and hiking

regularly, but things began to change. Finding her balance became more difficult. She began bumping into people and became more prone to falling. Her vision worsened and although she can still drive today, the hardest part was giving up driving her grandchildren. Determined to find a cure, Wendy began researching physician scientists across the country, until she came across Jeffrey Goldberg, MD, PhD, the Blumenkranz Smead professor and chair of ophthalmology at the



The basic science research group includes: **Front row (L to R):** Jeffrey Goldberg, MD, PhD; and Vinit Mahajan, MD, PhD. **Back row (L to R):** David Myung, MD, PhD; Alfredo Dubra, PhD; Yang Hu, MD, PhD; Michael Kapiloff, MD, PhD; Joyce Liao, MD, PhD; Yang Sun, MD, PhD; and Albert Wu, MD, PhD, FACS. **Not pictured:** Andrew Huberman, PhD; Jonathan Lin, MD, PhD.

Byers Eye Institute at Stanford, who at the time was a professor at UC San Diego and directing laboratory and clinical optic nerve research while treating patients. “I have had quite the medical journey,” Wendy said. “I have had cancer treatment, multiple surgeries, back surgery, open heart surgery, and with each one I bounced back quickly, but with my vision it has been tougher. Perhaps it is because my vision is especially precious to me and I had taken it for granted, so when I understood what Dr. Goldberg was doing with optic nerve research, I became a willing participant—his commitment gave me the hope I was looking for.” She continued to receive care from



Patients from all over the world will benefit from the research ongoing at the ODD Center.

“I am encouraged by what we have accomplished since opening the ODD Center. Our hope for the Center is to merge education, rigorous research, and above all provide better treatments for our patients.”

Goldberg when he came to Stanford. Wendy noted that attending the ODD conference was exceptionally informative and it was helpful to hear about the experiences of other patients with the disease.

“I am encouraged by what we have accomplished since opening the ODD Center,” Liao said. “Our hope for the Center is to merge education, rigorous research, and above all provide better treatments for our patients.”

To learn more about ODD, visit the Stanford Center for Optic Disc Drusen at the Byers Eye Institute website by scanning the QR code



From mother to patient

A patient's rare diagnosis plays a pivotal role in a multi-center study

A year ago, **Carolyn Miller** noticed some sensitivity in her left eye, and her eyelid felt swollen. One week later, she began to experience tingling on the left side of her face, a headache, and pain when she moved her eyes from left to right. She went to Stanford Hospital Emergency Department, where she had tests run, but ultimately, they ruled her initial symptoms as a migraine.

"A week later, my vision in my left eye became cloudy," Miller said. "It was as if I was looking through grease on a window shield and I couldn't put the images I was seeing together properly."

With worsening vision, Miller went back to her local

Moss sent Miller back to the emergency department, where she had a spinal tap and blood work to rule out lymphoma and other inflammatory and infectious diseases. Miller stayed in the hospital and was given a three-day treatment of steroids to decrease her inflammation. After that treatment, Miller's vision began to return, but as psychedelic patterns and colors.

"I was at my next appointment when the technician asked me to describe what I was seeing," Miller said.

"Out of my left eye it appeared as if she had tattoos with spinning yellow, shooting stars on her arms, but when I covered my left eye those images disappeared."

After the testing came back and was combined with their experienced serial examinations, Moss and Beres

"I feel fortunate to be a patient where I am at the cutting edge of what is going on for my specific disease."

eye specialist. Her doctor suspected the vision problems were being caused by complications in her optic nerve. Being the **mother of neuro-ophthalmologist, Shannon Beres, MD**, clinical assistant professor of neurology and neurological sciences and ophthalmology, Miller asked to be referred to the Byers Eye Institute at Stanford.

A newly discovered disease

Miller came into the Byers Eye Institute urgently that day to be seen by her daughter's neuro-ophthalmology colleague, **Heather Moss, MD, PhD**, associate professor of ophthalmology and of neurology.

After examining Miller's vision, Moss ordered an orbital MRI, which revealed inflammation of the optic nerve. Moss diagnosed Miller with **optic neuritis**, but was still unsure what was causing it.

found that the cause of Miller's optic neuritis was due to an autoimmune neurologic disease called **myelin oligodendrocyte glycoprotein (MOG) antibody disease**.

"The vivid color hallucinations she experienced in her left eye resulted from the brain trying to compensate for the vision loss," Moss said. "MOG is a rare disease that was only



Heather Moss, MD, PhD, diagnosed and treated Carolyn Miller's rare disease.



Carolyn Miller (left) with her daughter, Shannon Beres, MD, clinical assistant professor of neurology and neurological sciences and ophthalmology.

discovered in the last few years, so her diagnosis is acute in that there is still much to learn about how to tailor treatment for these patients."

The timing of Miller's diagnosis was quite serendipitous. She was experiencing symptoms at the same time Moss and Beres were delivering lectures at the Bay Area Ophthalmology Course at Stanford. Their Neuro-Ophthalmology lectures included a focus on optic nerve disorders, and were complemented by invited speakers brought in from across the U.S.

"Dr. Beres and I were doing research on MOG and had invited our collaborator, Dr. John Chen at the Mayo Clinic, where MOG was discovered," Moss said.

John Chen, MD, PhD, a neuro-ophthalmologist in the Mayo Clinic Department of Ophthalmology, had initiated a multi-center study now in progress at Stanford. Together, leading investigators from around the country are looking at patterns of the disease, the symptoms and imaging features associated with MOG, and studying treatments to prevent relapse of the disease after it is initially treated with steroids.

"I feel fortunate to be a patient where I am at the cutting edge of what is going on for my specific disease," Miller said. "Dr. Moss and her colleagues have been wonderful. I now have all my doctors here at Stanford, which allows a cohesive and coordinated support of my health profiles. I never feel like something will slip

through the cracks."

After treatment with steroids, Miller's vision was restored, and she now goes in for monitoring every six months. She has resumed activities that were put on pause when she first lost her vision, like going on walks, as previously her eyes were light-sensitive.

For Beres, this situation was unique for her to observe not just as a physician, but as the patient's daughter.

"At first it was scary thinking about the short-term and long-term consequences of what this disease could be, but I felt reassured having my mom treated by my colleagues who I know are exceptional," Beres said.

Miller said she has chosen to keep an optimistic view on the situation and her future. Having lived in the Bay Area her entire life and as a teacher of almost 30 years, now retired, she has developed strong relationships with those in her community, and feels blessed to have a supportive family that all live close to her. She finds it fortuitous to have a daughter who is a neuro-ophthalmologist locally and she is especially grateful for the exceptional care by Moss, who is actively advancing the research for her rare disease through collaborative research with national and international colleagues.

"I have much to be thankful for in my life," Miller said. "To anyone walking a similar road, I would tell them that keeping a positive attitude and trusting in your support system makes for the best outcomes."

Young patients receive sight restoring lenses

Rosie Karon was only two weeks old when her mother noticed her left pupil was misshapen. When her parents, **Shira Lipton, MD**, and **Adam Karon, JD**, decided to have her examined by a pediatric ophthalmologist at a local hospital, the specialist referred Rosie to the Byers Eye Institute at Stanford where she was seen by **Scott Lambert, MD**, professor of ophthalmology and chief of ophthalmology at the Lucile Packard Children’s Hospital Stanford. Lambert diagnosed Rosie with a **congenital cataract** and **persistent fetal vasculature (PFV)**.

These eye disorders are both rare, and while they affect a minority of children, the implications if not addressed can be lifelong.

Lambert and **Surbhi Bansal, OD**, clinical assistant professor of ophthalmology, recommended that Rosie undergo eye surgery and then be corrected optically with soft contact lenses. The surgery was successful, but the soft lenses caused corneal abrasions to Rosie’s eye, so they decided to transition her to **rigid gas permeable (RGP) contact lenses**.

Unparalleled care by Stanford doctors

Leaving Rosie’s left eye without an RGP lens was not an option, in fact, without one, Rosie was blind in her left eye. However, the RGP lens would often pop out on its own or get damaged, plus Rosie’s parents had to remove



Before using her new RGP lenses, Rosie underwent eye surgery for her congenital cataract and persistent fetal vasculature.

the RGP lens each night because Rosie could not sleep with it.

“There was about a 15-day stretch where we had to take Rosie to Byers for Dr. Lambert or Bansal to help remove the lens for us, because we couldn’t do it ourselves,” Lipton said. “Their care for our daughter was unparalleled. They would show up on weekends, holidays, and late at night to help us. We never expected that of them, and yet they remained committed to Rosie and her vision.”

Rosie will continue to wear the RGP lens in her left eye, but may opt for a permanent lens placement when she is older. For Rosie’s parents, any progress their daughter makes in terms of her vision is a victory, whether gaining her peripheral vision or reading letters on a visual acuity test.

Advancing change for other families

While RGP lenses are helpful, for some families, their high cost is not sustainable. If they break or a child outgrows them, they must be replaced. Often, however, insurance does not cover these expenses, deeming the lenses a cosmetic expense.

“When a family cannot afford these lenses and their health insurance will not cover them, it is the equivalent of telling an amputee that they cannot have a prosthesis,” Lambert said. “Children like Rosie need these lenses and are at risk of losing their vision entirely, which is why for years I’ve advocated bringing awareness to this disparity.”

Lipton and Karon are working on behalf of other children like Rosie by encouraging Congress to advance legislation to ensure these vision saving lenses are covered by insurance. **Congresswoman Anna Eshoo** and her **senior health policy advisor** have indicated they were unaware that contact lenses were not covered for infants after congenital cataract surgery and are vitally interested in addressing this need.

“Most recently Congresswoman Eshoo read a letter that I wrote about Rosie to the House and is hopeful that contact lenses can be covered under a bill currently



before congress called the Ensuring Lasting Smiles Act,” Lipton said. “This bill highlights the need for all

Rosie with her mother, Shira Lipton. Rosie has fully recovered from her surgery and is adapting well to the RGP lenses.

children with congenital anomalies to have full and adequate health care coverage, including necessary devices such as contact lenses.”

In the meantime, Lambert has set up a fund that allows donors to assist families who cannot afford contact lenses for their children after cataract surgery. To make donations for contact lenses, please scan the QR code and type “Pediatric Ophthalmology Support Fund” for Gift Designation.

“Our first priority is preserving and restoring vision, which is so important to the visual and social development of these children,” Lambert emphasizes.



Cross-department team effort conquers rare inflammatory eye disease

Three years ago, **Yolanda Velasco** began noticing difficulty distinguishing words and images on her computer screen. After her retina specialist attended a conference where **Quan Dong Nguyen, MD, MSc, FARVO**, professor of ophthalmology and director of the Uveitis and Ocular Immunology Service at the Byers Eye Institute at Stanford, was lecturing, he referred Velasco to Nguyen. Nguyen diagnosed Velasco with **panuveitis**, an uncommon condition of inflammation throughout the eye, which can lead not only to worsening vision, but to total blindness.

After trying first-line medications, Velasco was not seeing improvement in her vision, so Nguyen offered to enroll her in a clinical research program. There they stumbled upon an accidental second discovery: every time she had blood drawn for the clinical trial, her blood kept clotting.

Nguyen recognized there was an underlying disease and directed Velasco to **David Iberri, MD**, clinical assistant professor of medicine in the division of hematology, who diagnosed her with **chronic lymphocytic leukemia (CLL)**, a type of white blood cell cancer.

Nguyen and Iberri teamed up to tailor Velasco’s treatment, which has included chemotherapy against the



Quan Dong Nguyen, MD, MSc, FARVO, (left) continues to see patient Yolanda Velasco for evaluations every three months.

CLL cells, and additional, newer medications infused to block residual cancer cell antibodies from inflaming and damaging the retina. Together, these therapies allowed Velasco to regain some of the vision she’d lost.

“Our ability at Stanford to customize and individualize care for a patient with novel, innovative treatments was critical,” Nguyen said.

With restored vision, Velasco has resumed driving to see her children and grandchildren, which had to pause when her vision was at its worst.

“I have had the best experience with the entire Stanford team,” Velasco said. “While my eye diseases set me back, the care I received at Stanford consistently gave me the strength I needed to move forward.”

The joy of giving sight

Generous donors fund innovative breakthroughs for retinal diseases

While playing golf five years ago, **Tom Harrington** noticed he had difficulty seeing the golf flag. This was a first for him, so he scheduled a visit to see an ophthalmologist. Tom received a diagnosis of **dry age-related macular degeneration (AMD)**. AMD, a leading cause of vision loss in the U.S. for ages 50 and older, is caused by the death of the photoreceptor cells in the back of the retina, leading to progressive loss of central vision and in some cases, blindness.

Tom was told there wasn't a cure or effective treatments for dry AMD and there was no way to even know how much and how quickly his vision would deteriorate. Desiring a more auspicious answer, he came to the Byers Eye Institute at Stanford. There, **Steven Sanislo, MD**, clinical professor of ophthalmology, arranged for him and his wife, **Susan**, to meet with several research teams, all passionately at work to find a breakthrough for those suffering from dry AMD. They were introduced to **Vinit Mahajan, MD, PhD**, associate professor of ophthalmology, who directs a lab studying genetics, proteomics and phenomics to identify molecules involved in AMD and other retinal diseases to develop improved treatments and cures.



Susan and Tom Harrington

"Although Dr. Mahajan's collaborative research includes complex ideas, he communicated it in a way Susan and I could easily understand," Tom said. "I have friends who work in university research who say they are trying to discover something, but not necessarily trying to solve a problem. Dr. Mahajan is truly trying to find a cure for AMD. It's just as exciting, really, as being part of a start-up on the for-profit side."

Tom, a successful entrepreneur who has established five start-ups in Silicon Valley, and Susan, a strong advocate for educational, reproductive health, and environmental non-profit initiatives, have dedicated their lives to making a difference. Knowing that AMD affected not just Tom, but many people worldwide, the Harringtons made a philanthropic gift to advance Mahajan's research.

Mahajan and his team are taking a multi-faceted approach to address the urgent need for improved AMD treatments. Proteomics, the study of proteins, is one example where the team's efforts are showing great promise. Mahajan and his group found that when photoreceptors degenerate, certain proteins essential to retinal health are lost. By replacing specific metabolites, they were able to slow retinal degeneration in mice.

"If retinal damage can be delayed for longer than a patient's lifespan, the disease, while not cured, is no longer a concern," Mahajan said.

Their next step is to develop a therapeutic that could be administered into the eye to preserve photoreceptor health and vision in humans.

"The joy of giving is that Susan and I are able to feel that we are part of this team that is working towards a greater good," Tom said. "We are fortunate enough to fund research we feel passionate about that could change people's lives. There's great hope, and there is already considerable progress. People with this disease can look forward to some breakthroughs in the next few years."

Vision restoration in glaucoma

A donor's gift accelerates translation from lab to clinic

Laura Dubrow has approached the challenges of **life-long glaucoma** in both eyes with courage, determination, and a sense of humor. Glaucoma is the result of **damage to the optic nerve**, which over time may lead to vision loss and blindness. It is the leading cause of irreversible blindness in the world, impacting millions of people globally and in the United States. Recognizing that there is currently no cure for glaucoma or a way to restore vision once lost to the disease, Laura decided to support cutting-edge research at the Byers Eye Institute at Stanford to better understand the cause of, and ultimately prevent and treat glaucoma.

Seeking new research

Laura has always been a proponent of challenging the status quo and has always viewed science as a means to achieve progress. In the early 1960s, when it was rare to see many women working in STEM (science, technology, engineering, and math) fields, Laura majored in mathematics at her college in Albany, New York, and was recruited to work for General Electric on the second atomic submarine. Until the age of 39, she had excellent vision, but that year during a routine eye exam, she was first diagnosed with glaucoma—this was the start of her journey.

In the decades since that initial diagnosis, Laura has seen significant changes in the therapies and tests for glaucoma. She has tested different medications, undergone surgeries, and even supported medical research by personally participating in experimental studies. For one treatment, she had to take eye drops every hour, and she still remembers carrying a small timer in her purse which would go off unexpectedly and startle everyone around her.

"Once I ran into another participant from that study at the post office shortly before the Christmas holidays, so it was jammed packed with people," Laura said. "She was carrying around a kitchen timer to remind her of her eye drops. Her alarm started to go off followed by mine while we were waiting in line. All the other people moved

away from us."

Early on, the disease did not affect her vision dramatically, but as she got older she experienced significant deterioration in her vision. Her optic nerve continued to degenerate, particularly in her left eye.

After moving to the Bay Area about five years ago, she joined a community support group for individuals with vision problems. There she first learned of the research efforts of **Jeffrey Goldberg, MD, PhD**, Blumenkranz Smead professor and chair of ophthalmology. She was particularly interested in his first-of-its-kind clinical trials in the U.S. using **neurotrophic factors** to preserve vision in glaucoma patients.

"It's so important to keep researching," Laura said, "There is so much to learn yet. That's why I'm eager to support Dr. Goldberg's research, because I would love to see him be able to stop glaucoma for other people before they get to the stage I'm in."

Supporting future generations

Glaucoma has a long history in Laura's family, spanning at least three generations. Both of her grandmothers, her mother, her brother, an aunt, and two of her cousins were also diagnosed with glaucoma. With so many family members and friends who have been affected by this disease, Laura unfortunately knows all too well the terrible consequences that glaucoma can have on a person's vision. With glaucoma's hereditary nature, she worries for the future of her grandchildren's vision as well.

"I don't want my grandchildren, or anybody else, to suffer from glaucoma the way I do," Laura said. "But I know from seeing the research Dr. Goldberg is pursuing, especially his research on retinal ganglion cells relating to vision restoration, there is hope for future glaucoma patients."



Laura Dubrow

A global career path

Health equity and female empowerment

Byers Eye Institute at Stanford chief resident **Malini Pasricha, MD**, grew up in the United States, but whenever visiting her ancestral home in **Rayavaram, Tamil Nadu, India**, she was often struck by two major disparities: limited access to healthcare and minimal career opportunities for women.

Rayavaram is a village with unpaved roads, limited access to running water, and frequent power outages. Previously, the entire region did not have a single eye clinic to serve its 1.5 million residents. Most residents bore the burden of their eye diseases indefinitely; in cases where they elected to seek care elsewhere, the cost of transportation and lost wages due to time spent traveling added additional burdens.

Additionally, in the community, women rarely pursued higher education and career advancement. Most were married at a young age and dedicated their lives to homemaking.

Pasricha had an idea for how to solve both of these unmet needs head-on: **start an eye clinic locally and educate and encourage women to staff it**. The first major hurdle to cross was finding a place to develop such a clinic, but here her grandparents stepped in to help by offering to donate their ancestral home in Rayavaram.

“My grandmother had told me many times before that she wanted to use our home to serve a greater good,” Pasricha said. “She brought an incredible energy to the initiative and was eager to support at every step of the way.”

Measuring the need for eye care

The seed of Pasricha’s interest in eye health disparities started growing the summer after graduating high school, when she traveled to India and attended an eye appointment at the local hospital with her uncle, who has diabetic retinopathy. Noticing her youthful curiosity, the ophthalmologist invited Pasricha to stay for the day to observe. That day, Pasricha was struck by the number of patients presenting with eye diseases that



Malini Pasricha, MD (left) with her grandmother, Vallikannu Chidambaram, in 2011 during the first eye camp in Rayavaram, Tamil Nadu, India.

were immediately treatable or preventable if detected at an earlier stage. She felt inspired to pursue a career in ophthalmology to address eye disease worldwide.

Focused on better educating herself on global health, Pasricha entered her freshman year at Duke University, where she designed her own major, titled Global Health Disparities and Development Strategies. She identified effective principles for improving eye care accessibility in another country, one of which was **sustainability**. For this she knew she would need to partner with a local hospital for clinical staff support. She also envisioned a care model that would charge a nominal fee to cover basic maintenance, supply, and staffing costs, such that the facility could function independent of external funding and leftover supplies.

In 2012, as Pasricha began medical school, she sought a clinical partnership with the **Aravind Eye Hospital**, a prestigious national eye health care system with a flagship facility located a two-hour drive from Rayavaram. Over the next four years, she planned and executed several one-day eye camps in Rayavaram, where patients could undergo vision screening and counseling in their local area. Setting up these camps required securing grants and supply donations from U.S.-based organizations, establishing a partnership with the local government and community college for non-

medical support and volunteers, and publicizing these opportunities for care in a mostly illiterate population.

The initial response was overwhelming. With hundreds of patients treated at the eye camps, her work confirmed the community’s need and desire for eye care services.

Building female leaders

As hard as it was to operationalize eye care in this impoverished community, Pasricha also found herself up against an equally formidable challenge as a young woman trying to effect change.

“My two sisters and I were raised by my parents to be strong, independent women,” Pasricha said. “I remember visiting Rayavaram at the beginning of this project with big hopes, but instantly felt small and invisible. The culture was not readily welcoming to me as a woman trying to move the project forward.”

Though disheartened at first, Pasricha turned these feelings into fuel for change.

“We needed to create female leaders within the community,” Pasricha said.

Pasricha and her grandmother visited the local high school to recruit women who had the potential to pursue health technician training at the Aravind Eye Hospital. They identified five young women, met with their parents to discuss the value of such training, and promised subsequent employment in the eye clinic or other Aravind-affiliated eye clinics in the region. All five completed their training and moved into new roles providing eye care.

“Now these women are seen as pioneers and role models for the women in the area,” Pasricha said.



Malini Pasricha with two of the health technicians in 2016, Vimala and Marikannu, who were identified from the local school, trained, and employed at the new Aravind Vision Centre of Rayavaram.



Health technicians, Radhika and Marikannu, examine a patient in January 2020 at the Aravind Vision Centre of Rayavaram.

The final countdown

After eight years of hard work, the **Aravind Vision Centre of Rayavaram** opened its doors in January 2016. The clinic now operates six days a week and is staffed by two female eye health technicians. The facility is stocked with state-of-the-art equipment and supplies, and operates with an electronic medical record system, broadband internet, and daily cleaning staff. Visits are affordable to the local community (the equivalent of 25 cents in U.S. currency), and an onsite optical shop adds access to needed eye care while also offsetting the clinic’s basic functioning costs. In an effort to promote prevention-based care, the primary role of one health technician is to educate patients about their eye health. An ophthalmologist stationed at the main Aravind Eye Hospital also tele-consults on every patient via webcam.

Pasricha has worked tirelessly to bring this to fruition, but she is first to credit those who helped her.

“I really have to thank my grandmother for being a driving force behind this,” Pasricha said. “She barely completed twelfth grade, but her courage and giving spirit are inspiring.”

Pasricha tries to visit the clinic as often as she can, most recently in January 2020, to continue to improve and expand the clinic. Clinical data is collected on an ongoing basis to help quantify successes and identify areas for improvement.

“The Aravind Vision Centre of Rayavaram is a reflection of two broad goals I am most passionate about: health equity and female empowerment,” Pasricha said. “As I move on to pursue a training in vitreoretinal surgery, I hope to focus on improving access to retina-related eye care in developing countries and continue to find ways to support women in becoming accomplished health providers.”

Pursuing excellence through diversity, equity, and inclusion

Developing a diverse workforce: Building the pipeline

The year 2020 was momentous in many ways, including the heightened attention to issues of systemic injustice towards minorities that have long existed in our society. The national discussions that emerged encouraged the Byers Eye Institute at Stanford team to consider their own ongoing efforts to embrace the values of diversity, equity, and inclusion. One of the critical ways the department does this is through the **Stanford Clinical Opportunity for Residency Experience (SCORE) Program**.

SCORE brings fourth-year medical students from **underrepresented and minority (URM)** backgrounds to Stanford for a month-long residential clinical training program at the Stanford Hospitals & Clinics and Lucile Packard Children’s Hospital Stanford, matching them with faculty, resident mentors, and research advisors who share similar clinical interests. Byers Eye Institute has supported SCORE students each year since partnering with the program in 2016, and this past year saw the highest number of participants entered into the competitive program to date.

At Byers Eye Institute, SCORE clinical clerkship programs are led by ophthalmology faculty, and include a flexible clinical curriculum and regular didactic sessions, enabling its students to work and learn side-by-side with residents and faculty. Stanford Ophthalmology also provides clinical rotations in hospitals that expose residents to different patient populations, including the VA Palo Alto Health Care System and the Santa Clara Valley Medical Center county hospital.

This year, challenges brought on by COVID-19 prevented students accepted into SCORE from being able to rotate in person, so the program staff and faculty had to design new virtual opportunities so that students were still able to engage with the program in a safe environment. They participated in the virtual Bay Area Ophthalmology Course at Stanford and received

specialty-specific mentorship and access to the Stanford Ophthalmology Specialty career advising through the School of Medicine.

Along with mentorship activities, SCORE students are also able to engage in the same programs and activities as other Stanford medical students, such as those offered by the **Office of Faculty Development and Diversity** and **Stanford University Minority Medical Alliance**, to gain a robust engagement experience during their rotation. Being able to meet and connect with other URM students and residents also establishes a network that students can carry forward. By offering a breadth of experiences, SCORE ensures both the educational and professional development of diverse students into successful residents.

Expanding cultural competence for today and the future

Natacha Villegas, MD, born and raised in Venezuela and now a second-year resident at the Byers Eye Institute, participated in a similar program to SCORE in New York during her medical school training. There, she was able to experience different subspecialties in ophthalmology, plus experience firsthand how ophthalmology departments and rotations differ across institutions. The program also allowed her to connect with a community of URM students across institutions to share their medical school journeys.

“My experience showed me how important it is to recruit diverse residents and faculty and to have diversity in our training,



Natacha Villegas, MD



A group of female Stanford ophthalmology surgeons snap a photo before surgery to celebrate the Women in Ophthalmology symposium.

which helps us develop cultural competence, gaining the knowledge and skills necessary to effectively interact with patients who are culturally and ethnically diverse,” Villegas said.

When Villegas began interviewing for residency, she looked for a program that prioritized diversity, which she quickly found at the Byers Eye Institute. According to **Suzann Pershing, MD, MS**, residency program director, Stanford Ophthalmology remains strongly committed to the critical importance of diversity in our residency program and to recruiting and supporting individuals from all backgrounds.

“We have realized how valuable diversity in experience and background is for our program, and for the future of our field,” Pershing said. “In the 2019-2020 academic year, our residency program was comprised of 54% female,

46% URM, 15% LGBTQ residents, and 8% international medical graduate students. This speaks to our core values in the department and in the medical school at large.”

Spreading department impact to medicine more broadly

Ann Caroline Fisher, MD, clinical associate professor of ophthalmology, serves as the director of diversity and inclusion for Byers Eye Institute as well as the Stanford Ophthalmology specialty career advisor. She sees the positive impact that SCORE has not only on its participants, but on the entire department.

“Increased recruitment of diverse trainees into academic medicine not only paves the way for a more diverse future workforce, it also enhances the educational experience of existing Stanford medical students and faculty through greater diversity of ideas and expanding our network of collaborators,” Fisher said.

Engagement with the SCORE program is just one way that the department is steadily increasing the recruitment and support of underrepresented and diverse individuals into ophthalmology residency and faculty roles. Byers Eye Institute also recently created the **Committee on Ophthalmology Diversity, Equity, and Inclusion** to encourage dialogue about diversity and inclusion freely and openly for faculty, researchers, physicians, and staff from across the department.

Villegas said she is encouraged to see the growth Stanford has made to provide programs that diversify the clinician and faculty workforce.

“Having a diverse workforce ensures better community care for our patients and strengthens the caliber, depth, and ability of the Byers Eye Institute faculty and doctors,” Villegas said. “I am proud to be a resident at a department doing the work to make these necessary changes.”

To learn more or to apply for the SCORE program, visit med.stanford.edu/clerkships/score-program.

2019-2020
residency program
at a glance

54%
FEMALE

46%
URM

15%
LGBTQ

8%
INTERNATIONAL
MEDICAL GRADS

Meet our residents and fellows

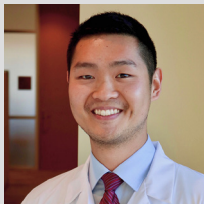
Residents Class of 2021



Jose Davila, MD



Giancarlo Garcia, MD

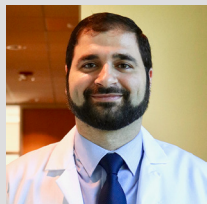


Jong Park, MD

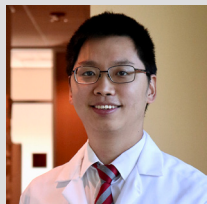


Malini Pasricha, MD

Residents Class of 2022



Ahmad Al-Moujahed
MD, PhD, MPH



Bryce Chiang, MD, PhD



Luciano Custo Greig
MD, PhD
SOAR Program

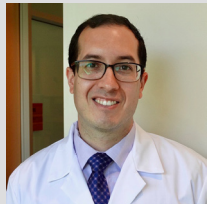


Connie Sears, MD

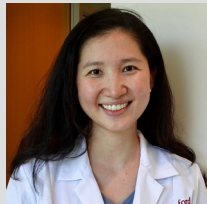


Natacha Villegas, MD

Residents Class of 2023



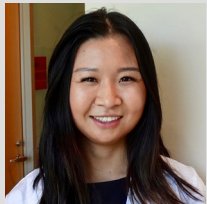
Alejandro Arboleda, MD



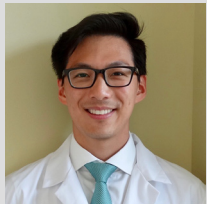
Lucie Guo, MD, PhD
SOAR Program



Muhammad Hassan, MD

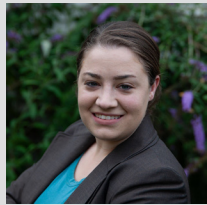


Tracy Lu, MD



Michael Yu, MD

Residents Class of 2024



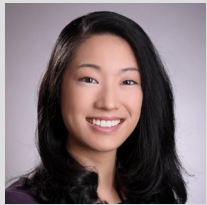
Caity Logan, MD, PhD
SOAR Program



Andrea Lozano Naranjo, MD



Louise Lu, MD

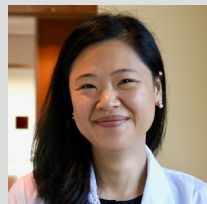


Elaine Tran, MD

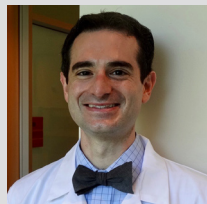


Geoffrey Weiner, MD, PhD
SOAR Program

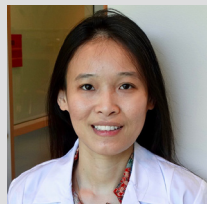
Clinical Fellows Class of 2021



Julie Cho, MD, PhD
Glaucoma



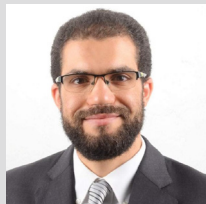
Philip Garza, MD, MSc
Glaucoma



Susiani Intan, MD
Neuro-Ophthalmology



Bethlehem Mekonnen, MD
Cornea



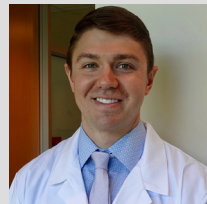
Hashem Ghoraba, MD, MSc
Uveitis



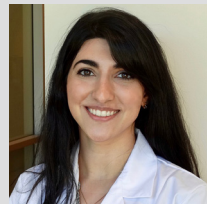
Huy Nguyen, MD
Vitreoretinal



Nadim Rayess, MD
Vitreoretinal



David Rooney, MD
Global Health



Solin Saleh, MD
Pediatrics

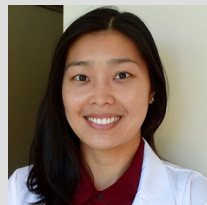
Clinical Fellows Class of 2022



Gala Beykin, MD
Glaucoma



Edward Korot, MD
Vitreoretinal



Clara Men, MD
Oculoplastics



Kapil Mishra, MD
Vitreoretinal

Ophthalmic Innovation Fellow 2021



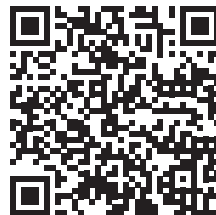
Michael Mbagwu, MD

Congratulations class of 2020!

To see where our graduates are headed next, scan the QR codes below.



Resident Alumni



Clinical Fellow Alumni



PhD and Postdoc Alumni

The Byers Eye Institute team: A global map

Our department is proud to attract top talent from around the world. Take a look at the diverse locations our incredible team has traveled from, to train and work at the Byers Eye Institute at Stanford, as well as sites around the world we have focused programs for patient care and education.



40

countries represented

8

international locations faculty provided care during 2019-2020

66

resident alumni since 2001

42

fellow alumni since 2001

78

visiting observer alumni since 2018

Advancing clinical research in the age of COVID-19

In clinical trials, both patients and faculty have to carefully balance potential benefits against potential risks in deciding who should be in a clinical trial—and this year the Byers Eye Institute at Stanford faced a new risk in that calculation. The first case of **novel coronavirus (COVID-19)** in the Bay Area was diagnosed near the end of January 2020. Case numbers continued to grow locally and on March 16, six Bay Area counties announced a shelter-in-place order. Since then, COVID-19 has changed lives for people worldwide. Students adapted to online education, celebrations switched to a virtual format, and masks and distancing became the new way of life.

Teams at Stanford also made necessary changes as faculty and clinical leadership prioritized the safety of patients, employees, and the community. University and health system leaders worked closely with government and public health agencies and continue to follow guidelines from the U.S. Department of State, the Centers for Disease Control and Prevention, the World Health Organization, and state and local authorities.

Some of the important safety changes that took place because of COVID-19 included identifying essential clinical research, training staff and patients to new protocols, and changing to remote work when possible—but for those involved in clinical trials, not all work could be done remotely.

While closely monitoring the outbreak, the department sought ways to continue clinical trials during the pandemic with minimal extra risk to health—balancing the risk of virus transmission against the risk of delaying potentially vision-saving therapies. With everyone’s safety as the top priority, the department clinical trials team leapt into action.

Delivering therapies and prioritizing safety

“At the beginning of the shelter-in-place order, we had to react quickly. We only kept studies open where human subjects were already enrolled and whose ongoing treatment was considered essential for the subject’s vision and safety,” **Mariana Nuñez**, Clinical Research Manager, said. “We had to temporarily pause

some clinical trials, and for those that continued, we temporarily didn’t enroll new subjects.”

Nuñez helps lead a team of over a dozen **clinical research coordinators (CRCs)** and clinical research fellows who are part of the Mary M. and Sash A. Spencer Center for Vision Research at the Byers Eye Institute. When Nuñez first joined the department nearly five years ago, there were about eight open trials, but now faculty clinician-investigators are running over 40.

“The growth in clinical trials reflects our department’s focus on translational research,” **Heather Moss, MD, PhD**, associate professor of ophthalmology and director of clinical research, said. “The only way to move advances in the laboratories into advances in patient care is through clinical trials.”

Nuñez and the other CRCs act as a liaison between all parties involved in a clinical trial, and are responsible for the day-to-day work of running clinical trials, including enrolling and guiding subjects in the studies and helping them understand and navigate being a study participant, managing data, and ensuring compliance with the IRB and the U.S. Food and Drug Administration.

In April, strict guidelines were set in place for clinical trials. Subject testing and in-person visits were reduced, many visits were switched to video, and for some studies, medications had to be shipped directly to the patient’s home.

By May and early June, there was better understanding of how to reopen for in-person clinical trials in a safe manner. Personal protective equipment, universal masking, and physical distancing protocols were established. All research staff were tested negative for COVID-19 before coming back to work in person. A detailed calendar was used to stagger who was in the building. General hygiene was continued by washing hands, wearing gloves, and sanitizing work spaces. Subjects who came in for trials were screened prior to their visit for symptoms, fever, illness, or recent travel—just as all staff did a similar daily screening and attestation.

“We took a lot of extra steps to make sure study subjects and ourselves were kept safe,” Nuñez said.



*The clinical research team has implemented health and safety protocols as they resumed in-person research work during COVID-19. The team includes: **Front Row (left to right):** Maya Mahajan, Kristina Liu, and Supriya S. Kawale. **Back Row (left to right):** Mariana Nuñez, Betul Akcay, Tom Khavari, Kenny Trang, and Mark Santos. **Not pictured:** Teja Chemudupati, Naz Jehangir, Aarushi Kumar, and Zhongqiu Katherine Li.*

“There is a general fear that anyone could get infected, so anything we can do to reassure patients is helpful.”

An investigator’s perspective

The faculty clinician-investigators have been integral to assessing potential risk and benefit to patients and adapting trial design and data collection and analysis procedures. **Theodore Leng, MD, MS**, associate professor of ophthalmology and director of clinical and translational research, researches novel treatments for macular diseases and machine learning applications for tele-ophthalmology. Although he had to temporarily

collaboratively with industry sponsors of clinical trials to ensure that in-person patient visits were minimized to only the absolutely necessary study procedures.

“Clinical research is a very critical component of care of patients with vision threatening eye diseases, and access to the latest therapies and diagnostics is why patients come to Stanford,” Do said. “Our team has been dedicated to create a safe environment for our study subjects to ensure that they receive these study therapies that can save patients’ vision.”

Through a team effort, they hope to continue growing the number of ongoing trials in the future while still

“We have to protect our patients today, but also continue our mission to lead a path to the future. Clinical trials are critical to getting there, and I’m grateful to have a skilled and committed team at the Byers Eye Institute.”

pause patient visits during the initial stages of the pandemic, he quickly adapted to avoid negative impact on research progress.

“We had to make changes, such as create new procedures to keep research subjects and research staff socially distanced, establish new health screening/hygiene protocols and introduce appropriate PPE to the workflow, but we were still able to continue providing therapies to these patients,” Leng said.

Diana Do, MD, professor of ophthalmology and vice chair for clinical affairs, is a national leader in retinal therapy-related research studies. Do worked

prioritizing patient safety and care.

“We have to protect our patients today, but also continue our mission to lead a path to the future,” Moss said. “Clinical trials are critical to getting there, and I’m grateful to have a skilled and committed team at the Byers Eye Institute.”

For more information, scan the QR codes below.



Clinical Trials



**Stanford Medicine
COVID-19 resources**

Improving ophthalmologic care through artificial intelligence

For some, hearing the words artificial intelligence, or AI, sparks imaginative scenes of robot overlords, self-driving cars, dystopian surveillance, chatbots, and machines replacing humans at work. However, researchers and faculty at the Mary M. and Sash A. Spencer Center for Vision Research at the Byers Eye Institute have begun to embrace AI and its promise to improve disease prediction and identify novel therapies to improve eye care. Indeed, the first FDA-approved AI application was cleared for ophthalmology to detect retinal damage in diabetes (see “Tele-Ophthalmology: Digital care in a digital world”, page 5).

Paving the way with imaging and structured big data

Theodore Leng, MD, associate professor of ophthalmology, has been concentrating his efforts in leveraging AI technology to improve diagnostic

prediction in age-related macular degeneration (AMD). In AMD, there is an insidiously progressive dry form of the disease that is very common, and an explosive, damaging wet form that affects a subset of patients. Leng worked with **Daniel Rubin, MD**, professor of biomedical data sciences and of ophthalmology, to develop algorithms that for the first time could predict which patients with dry AMD would progress to wet—an enormous step forward for the field.

Robert Chang, MD, associate professor of ophthalmology, has been an early adopter of introducing AI into vision care. Recently, Chang’s multidisciplinary team published a study where they used AI algorithms on full, 3D macular **optical coherence tomography (OCT)** images to detect if patients need a referral for glaucoma.

“Early detection of glaucoma is key to preventing long-term disability,” Chang said. “Also, clinically we have trouble distinguishing glaucoma from nearsightedness, or myopia, so we included those challenging cases into the algorithms too.”

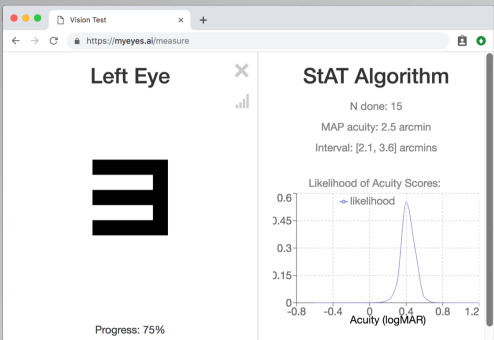
Chang’s team is amassing a multimodal dataset from Stanford, compiling retinal and optic nerve photos, OCTs, visual field tests, and treatment history from the past 10 years and over 1,000 patients. They supplemented it with similar international datasets for external validation. Chang anticipates that incorporating this data will allow the algorithms to handle more patient-to-patient variability and be less susceptible to error.

Understanding unstructured data in patient notes

Working with Chang, **Sophia Wang, MD**, assistant professor of ophthalmology, is also leveraging big data to improve patient care. Wang, a previous Stanford glaucoma fellow, is training an algorithm to improve how electronic health records information is extracted and analyzed on the scale of hundreds of thousands to millions of ophthalmic patient records.

In a typical doctor’s note, rich information from clinical

1. Take an eye exam on this website



3. Calculate the results

The Stanford Acuity Test allows users to perform repeated vision testing from the comfort of their home via a smartphone and a website.

findings to treatment details is written in sentences and using medical jargon, which is difficult for computers to analyze. Wang’s approach uses **natural language processing**, a subfield of AI, that allows a computer to understand human language as a person speaks or writes.

Wang collaborates with **Tina Hernandez-Boussard, MD, PhD, MPH**, associate professor in medicine (biomedical informatics), and **Suzann Pershing, MD**, assistant professor of ophthalmology and of health research and policy, in accessing one of the largest national registries of health data—the American Academy of Ophthalmology IRIS Registry. With access to such diverse, longitudinal, high quality datasets, these glaucoma algorithms eventually may predict who will respond best to different therapies.

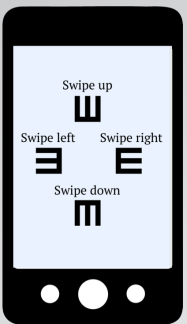
“My hope is that our algorithms will tell us if a patient is low or high risk and needs surgery sooner, and maybe even what surgery would be best for them,” Wang said.

Upgrading the traditional vision exam

Chris Piech, PhD, assistant professor of computer science, received a diagnosis of uveitis, or intraocular inflammation, when he was just 8 years old, and has spent his life battling an array of eye complications ever since. After undergoing recent cataract surgery at Byers Eye Institute by **Charles Lin, MD**, clinical associate professor of ophthalmology, Piech asked if Lin was interested in collaborating on a project to improve the traditional eye chart, called the Snellen vision test.

“Chart-based visual acuity is not always accurate,”

2. Connect your phone



Piech said. “As patients get further down on the chart and letters began to blur, they begin guessing, which leads to variable and sometimes inaccurate results.”

Chang joined the collaboration, as did **Ali Malik**, a PhD computer science student in Piech’s lab, and **Laura Scott**, Piech’s wife. Their collaborative project quickly proved successful, and the results formed the basis for the Stanford Acuity Test, an online test driven by AI, which can now be accessed at **www.myeeyes.ai**.

The test reduced 74% of error when run on 1,000 computer simulations that mimicked real patients. While it doesn’t replace a doctor visit or provide medical advice, it can serve as a helpful tool for repeated self-vision testing.

The results were published in the *Proceedings of the AAAI Conference on Artificial Intelligence*, and the group is now conducting a study comparing the Stanford Acuity Test with Snellen and ETDRS exams in patients.

Computer-assisted vision testing

Ann Shue, MD, clinical assistant professor of ophthalmology, is trained in two subspecialties, pediatric ophthalmology and glaucoma. Along with Chang, she is testing the reliability of using virtual reality (VR) to test visual fields, especially in children. In her clinic, patients are trying out two different VR headsets in lieu of traditional visual field tests.

“A VR visual field test allows patients to sit in a position they are comfortable with, while still allowing us to get information to form a diagnostic portfolio,” Shue said. “And, computer-assisted vision testing would also allow patients the flexibility of vision testing from home, which is helpful in the time of COVID, but also any time, or for patients in remote areas with limited access to care.”

The future of AI at Stanford

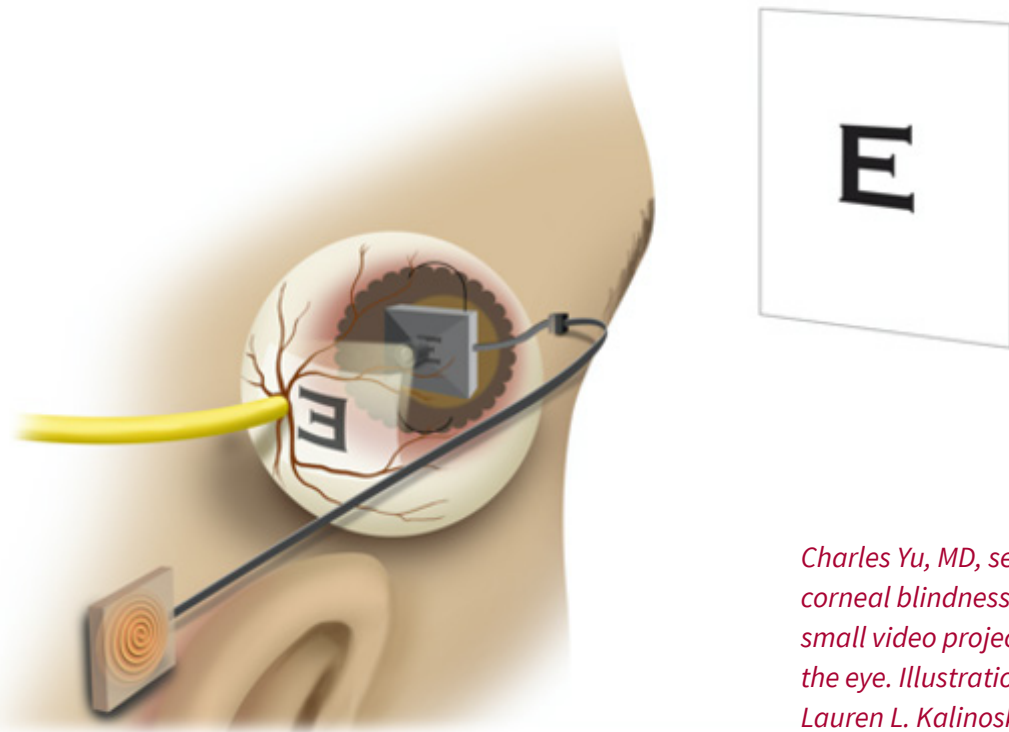
Together, these cutting-edge research projects have incorporated AI into the research and clinical environment at Stanford to help validate new technology for future clinical care.

“Stanford has facilitated a supportive environment for bringing technology from the lab into the clinic,” Chang said. “Ultimately, understanding vast amounts of data and knowing how to analyze it is the key to enabling doctors to predict a patient’s future and thus truly personalizing his/her treatment plan.”



Patient Hana Feldmeier tests a virtual reality headset to assess her visual field.

Solving corneal blindness with implantable video technology



Charles Yu, MD, seeks to treat corneal blindness by creating a small video projector implant for the eye. Illustration courtesy of Lauren L. Kalinoski.

Corneal blindness is a leading cause of blindness worldwide. More than 12 million patients remain on cornea transplant waitlists while suffering from corneal blindness, but an idea from one researcher may have an answer. **Charles Yu, MD**, assistant professor of ophthalmology, is leading an effort to take a novel electronic approach to treating corneal blindness. The implant includes a **projector that transfers images from the outside world onto the retina**.

The cornea is the clear, front part of the eye that functions similar to a window, helping focus images entering the eye onto the retina. While it can heal quickly from minor injuries, a major injury or disease can cause scarring, appearing as a white, clouded film, which then causes blindness.

"All current strategies for corneal blindness focus on

restoring clarity to the cornea, by transplanting on a clear donor cornea or by sewing in a plastic replacement," Yu said.

He notes corneal transplants have significant limitations. Transplants require donors, which require extensive logistics for harvesting, screening and delivery, which can cause patients to be put on a waitlist until one is available. Outside of the U.S., it is hard to get a cornea transplant, and some cultures are averse to organ donation, resulting in a severe shortage of tissue. Many developing countries lack the resources to create a distribution and waitlist system at all.

Even in the U.S. there are many challenges. More severe cases of corneal scarring cannot be transplanted due to high risk of rejection. Corneal transplants require lifelong follow up and are always at risk of long-term rejection. Cornea transplantation is often unsuccessful in pediatric patients.

However, it turns out that fundamentally, corneal clarity is not necessary for high quality vision as long as a clear image can be delivered to the retina.

"Electronic displays can be used to bypass corneal blindness," Yu said. "By using electronic implants, we avoid the need for transplants and their limitations entirely."

A movie projector inside the eye

Yu's electronic implant is comprised of two technologies, **a wireless video receiver and a micro display**. In his innovative approach, a patient would wear a camera built into glasses or a contact lens. The camera would then transmit wirelessly to a small video display inside the eye and that image would project onto the retina. This would allow people with corneal opacity to see, even with closed eyelids.

During his ophthalmology residency training at Stanford, Yu completed a research project using Google Glass, a smart glasses device that is used for augmented reality. Seeing that this device allowed patients to view video on a pair of eyeglasses, Yu began brainstorming, and that was when he first thought of implanting a small television-like device into the human eye. Six years later, his dreams are gaining traction and he is hopeful it will become reality.

To put this novel device together, Yu has been sourcing components from electronics manufacturers.

"Almost every year there are upgrades in technology, whether that be smaller video displays or brighter screen colors," Yu said. "It is promising for the future of our patients to see these continuing improvements to product performance and function."

He is aided in his efforts by **Daniel Palanker, PhD**, professor of ophthalmology, who has extensive experience in the development of visual prosthesis for retinal blindness. Palanker's expertise has both helped and inspired Yu to determine the future path of his own research at the Mary M. and Sash A. Spencer Center for Vision Research at the Byers Eye Institute.

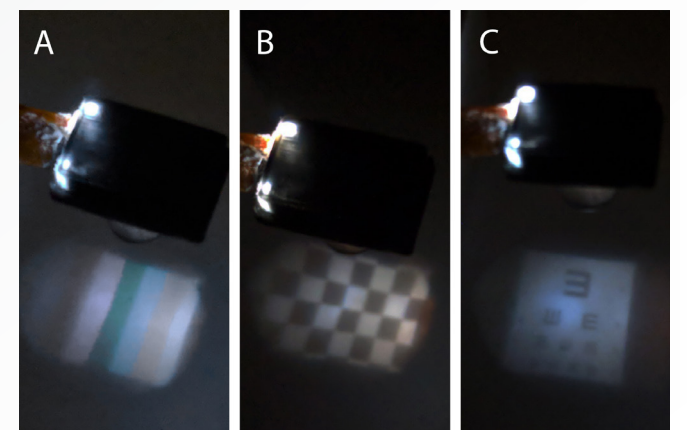
Moving from proof-of-concept to patient care

The electronic implant would benefit patients by eliminating the need for corneal transplants, and their challenges with patient access, lifelong steroid therapy, and cost over the long term. It would allow developing countries to treat corneal blindness, a benefit that motivated Yu ever since he first went to Africa to perform

cornea transplant surgeries. After his first trip there, he left excited that his team was able to perform so many surgeries, but when he returned a second time, he noticed that many of the transplants had failed from inadequate access to care. Seeing that previous patients had gone blind, it motivated him to identify new ways to treat corneal blindness that would not require extensive follow up.

Now working in the technology mecca of Silicon Valley, Yu has the ability to access the latest technologies from start-ups. He also collaborates with a local research and development subsidiary of the company Gore-Tex on material sciences, critical to biocompatibility of his device. He is hopeful for the future of this ongoing research, seeing that much progress has already been made. Yu notes that while the initial cost of these devices will be high, with economies of scale they could become very affordable.

"This technology can fundamentally change the way we treat corneal blindness," Yu said. "My hope is that in a few years we are able to transition this device to patients, so now it's just a matter of pushing hard to make that happen."



Charles Yu's miniaturized projector designed for implant inside the eye displays various images.



Charles Yu, MD, a former resident, joined the department as faculty in 2018.

AWARDS AND HONORS



Scott Lambert, MD, received the American Academy of Ophthalmology (AAO) **Secretariat Award**. Lambert also helped participate in a pediatric ophthalmology/dermatology continuing medical education course that was attended by more than 100 pediatricians, nurse practitioners, and many members of the department participated in the course.



Andrea Kossler, MD, FACS, received the **Outstanding Contribution Award** from the American Society of Ophthalmic Plastic and Reconstructive Surgeons. The award is given annually to an individual or individuals who make legendary single, or long-standing multiple, contributions to ASOPRS. Kossler also received the **Gerhard Cless Oculoplastic Lecture Award** from the Illinois Eye & Ear Infirmary.

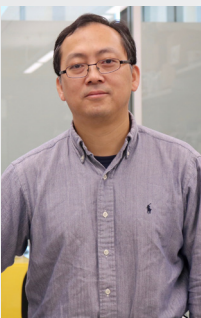
Jeffrey Goldberg, MD, PhD, was elected to the **National Academy of Medicine**. Goldberg's recognition highlights his contributions to the understanding of the survival and axon growth of retinal ganglion cells relevant to neuroprotection and regeneration, and for being a driving force behind biomarker development and vision restoration clinical trials in glaucoma and other eye diseases.

Prithvi Mruthyunjaya, MD, MHS, was the **keynote speaker at the 25th Annual VitreoRetinal Surgery Foundation Meeting** in Minneapolis, presenting on identifying and managing effects of new



cancer therapies on the eyes and advanced surgical techniques for exudative retinal detachments. The event was hosted by former vitreoretinal fellow, **Peter Tang, MD**.

Jeffrey Goldberg, MD, PhD; Daniel Palanker, PhD; Kuldev Singh, MD, MPH; and Geoffrey Tabin, MD, were selected for The Ophthalmologist magazine's **Power List 2020**, celebrating the top 100 "most influential figures in ophthalmology."



Yang Hu, MD, PhD, received the Chan Zuckerberg Initiative **Neurodegeneration Challenge Network Collaborative Pairs Pilot Project Award**. This will fund his collaborative research on glaucoma with Lei Stanley Qi, MA, PhD, assistant professor of bioengineering and of chemical and systems biology.

Sophia Wang, MD, received the Research to Prevent Blindness **Career Development Award** (see "Improving ophthalmologic care through artificial intelligence", page 28).

In early March, **Heather Moss, MD, PhD**, presented at the North American Neuro-Ophthalmology Society (NANOS) 2020 Annual Meeting on "Neuro-Ophthalmology Digital Consultations: The Stanford Model," which looked at telemedicine and telehealth.

Deborah Alcorn, MD, received the Medical Staff Distinguished Service Award from Lucile Packard Children's Hospital Stanford (LPCHS). This prestigious honor is given to five doctors whose long-term contributions have made a significant impact on medical staff and LPCHS.

Prithvi Mruthyunjaya, MD, MHS; Diana Do, MD; Quan Dong Nguyen, MD, MSc; and Stephen Smith, MD, hosted the **Stanford Retina Innovation Summit** through three virtual sessions. The summit series focused exclusively on the latest game-changing innovations in medical and surgical retina, imaging, and pharmacotherapy.



Julie Cho, MD, PhD, a glaucoma fellow, received the **Dr. David L. Epstein Award** from the Association for Research in Vision and Ophthalmology (ARVO), funding her research to develop new treatments for glaucoma.

David Myung, MD, PhD, helped organize and host the first **Collaborative Community on Ophthalmic Imaging (CCOI) Meeting**. Held virtually, the meeting gathered experts from around the world and across academia, government institutions, patient groups, and the private sector to discuss the state-of-the-art in artificial intelligence algorithms for ophthalmic imaging and to set out to clarify challenges, best practices, and strategies for implementing these algorithms. The video conference attracted over 1,100 registrants from 39 states, 42 countries, and six continents.



Caroline Fisher, MD, received the Office of Faculty Development and Diversity (OFDD) **Community Support Initiative Award**. This award recognizes Fisher for her efforts to build upon Stanford Medicine's core values: diversity, equity, and inclusion (see "Pursuing excellence through diversity, equity, and inclusion", page 20).



Kinsley Belle, PhD, a postdoctoral fellow in the Wood Lab, received the United Mitochondrial Disease Foundation **2020 Accelerators Prize**, which will support his research on mutations in mitochondrial DNA.

Malini Pasricha, MD, a third-year resident was selected as a **Top Poster** at the 2020 Women in Ophthalmology Virtual Summer Symposium. Pasricha's poster "Female Leadership and Award Recognition in the American Society of Retina Specialists" also provided her the opportunity to speak on a live discussion panel at the event.



Edward Korot, MD, a vitreoretinal fellow, received the **Google Cloud Research Grant**, allowing him to engage on the Google cloud platform and run collaborative artificial intelligence (AI) experiments on it. This includes datasets management, AI model development, evaluation, and launch of the final AI model into use.



Louise A. Mesentier-Louro, PhD, a postdoctoral fellow in the Liao Eye-Brain Lab, was awarded the **Translational Research and Applied Medicine Pilot Grant** with her project entitled, "The neuron-glia-vascular niche as a therapeutic target to prevent vision loss after hypoxic-ischemic disease."

Former fellow **John Hinkle, MD** (mentor: Prithvi Mruthyunjaya, MD, MHS), resident **Jose Davila, MD**, and former resident **Ryan Shields, MD** (mentor: Ira Schachar, MD, MSc), were ranked as American Society of Retina Specialists **top 10 poster award winners**.

FACULTY AND SPECIALTIES



Deborah Alcorn, MD
associate professor emerita
pediatric ophthalmology



Surbhi Bansal, OD
clinical assistant professor
optometry



Shannon Beres, MD
clinical assistant professor
adult & pediatric
neuro-ophthalmology



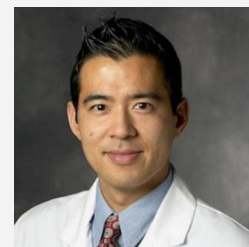
Jill Beyer, OD
clinical assistant professor
optometry



Steven Binder, OD
clinical assistant professor
optometry



Mark Blumenkranz, MD, MMS
H.J. Smead professor emeritus
vitreoretinal & macular diseases



Robert Chang, MD
associate professor
glaucoma
cataracts



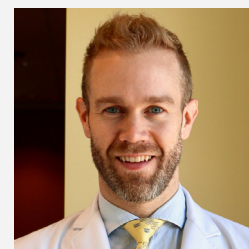
Diana Do, MD
professor
vitreoretinal & macular
diseases



Alfredo Dubra, PhD
associate professor
optical engineering



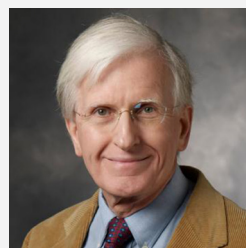
Peter Egbert, MD
professor emeritus
ophthalmic pathology



Benjamin Erickson, MD, MHS
clinical assistant professor
ocular & orbital oncology
oculoplastics



Caroline Fisher, MD
clinical associate professor
glaucoma
cataracts



Michael Gaynon, MD
clinical professor
pediatric
vitreoretinal & macular
diseases



Jeffrey Goldberg, MD, PhD
Blumenkranz Smead
professor & chair
glaucoma



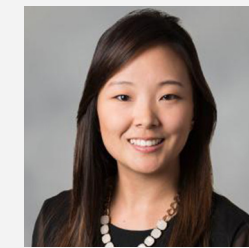
Yang Hu, MD, PhD
assistant professor
glaucoma & optic nerve



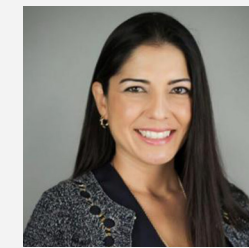
Michael Kapiloff, MD, PhD
associate professor
glaucoma & optic nerve



Henry Kistler, MD, PhD
clinical assistant professor
comprehensive
ophthalmology



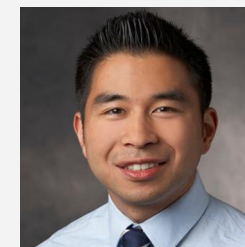
Euna Koo, MD
clinical assistant professor
adult strabismus
pediatric ophthalmology



Andrea Kossler, MD, FACS
assistant professor
ocular & orbital oncology
oculoplastics



Scott Lambert, MD
professor
adult strabismus
pediatric ophthalmology



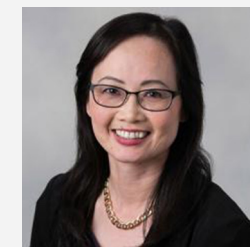
Wen-Shin Lee, MD
clinical assistant professor
glaucoma
cataracts



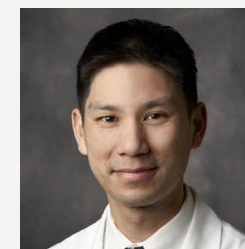
Theodore Leng, MD, FACS
associate professor
vitreoretinal & macular
diseases



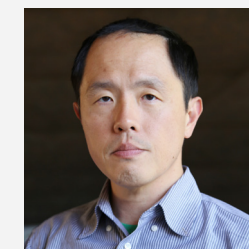
Loh-Shan Leung, MD
clinical assistant professor
vitreoretinal & macular
diseases



Joyce Liao, MD, PhD
associate professor
neuro-ophthalmology



Charles Lin, MD
clinical associate professor
cornea
cataracts



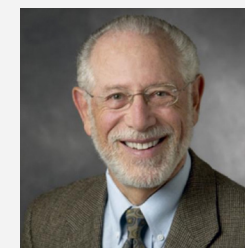
Jonathan Lin, MD, PhD
professor
ophthalmic pathology



Vinit Mahajan, MD, PhD
associate professor
vitreoretinal & macular
diseases



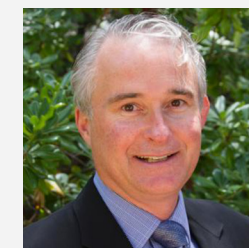
Edward Manche, MD
professor
cornea
refractive surgery



Michael Marmor, MD
professor emeritus
vitreoretinal & macular
diseases



Artis Montague, MD, PhD
clinical professor
cataracts
comprehensive ophthalmology



Darius Moshfeghi, MD
professor
adult & pediatric
vitreoretinal & macular
diseases



Heather Moss, MD, PhD
associate professor
neuro-ophthalmology

FACULTY AND SPECIALTIES



Prithvi Mruthyunjaya, MD, MHS
associate professor
ocular & orbital oncology
adult & pediatric
vitreoretinal & macular diseases



David Myung, MD, PhD
assistant professor
cornea



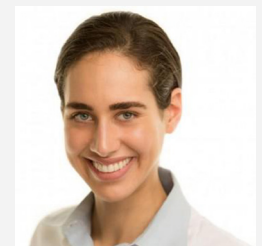
Quan Dong Nguyen, MD, MSc
professor
uveitis
vitreoretinal & macular diseases



Daniel Palanker, PhD
professor
engineering &
experimental physics



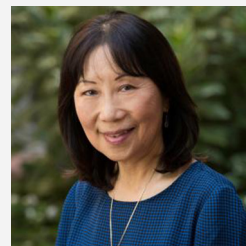
Carolyn Pan, MD
clinical assistant professor
vitreoretinal & macular
diseases



Suzann Pershing, MD
assistant professor
comprehensive
ophthalmology



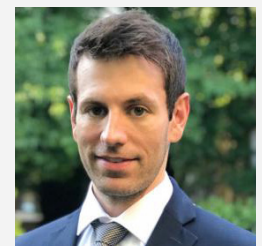
Tawna Roberts, OD, PhD
assistant professor
pediatric optometry



Susan Ryu, MD
clinical assistant professor
comprehensive
ophthalmology



Steven Sanislo, MD
clinical professor
vitreoretinal & macular
diseases



Ira Schachar, MD, MSc
assistant professor
vitreoretinal & macular
diseases



Ann Shue, MD
clinical assistant professor
adult strabismus
glaucoma, cataracts
pediatric ophthalmology



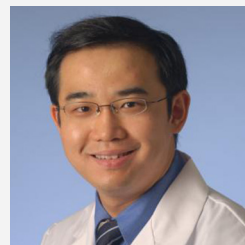
Ruwan Silva, MD, MPhil
clinical assistant professor
vitreoretinal & macular
diseases



Kuldev Singh, MD, MPH
professor
glaucoma
cataracts



Stephen Smith, MD
clinical instructor
vitreoretinal & macular
diseases



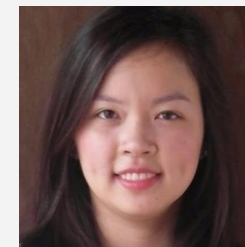
Yang Sun, MD, PhD
associate professor
glaucoma



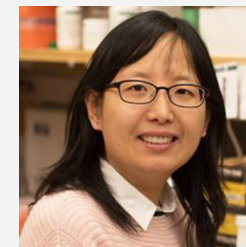
Christopher Ta, MD
professor
cornea



Geoff Tabin, MD
Fairweather Foundation professor
cornea
cataracts



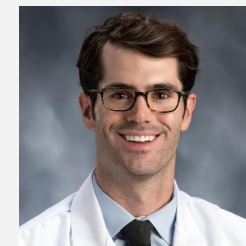
Sophia Wang, MD
assistant professor
glaucoma
cataracts



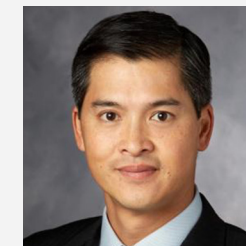
Sui Wang, PhD
assistant professor
retinal disease



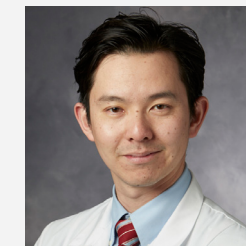
Katherine Warner, OD
clinical assistant professor
optometry



Edward Wood, MD
assistant professor
adult & pediatric
vitreoretinal & macular
diseases



Albert Wu, MD, PhD, FACS
assistant professor
ocular & orbital oncology
oculoplastics

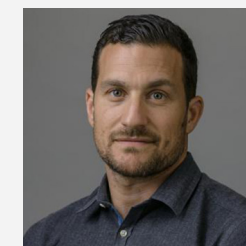


Charles Yu, MD
assistant professor
cornea
cataracts

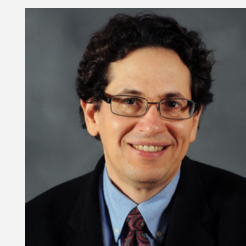
Other Vision Science Faculty with Appointments in Ophthalmology



E.J. Chichilnisky, PhD
professor
neurosurgery



Andrew Huberman, PhD
associate professor
neurobiology



Daniel Rubin, MD
professor
biomedical data science,
radiology, medicine
(biomedical informatics)



Creed Stary, MD, PhD
associate professor
anesthesiology, perioperative
& pain medicine



Douglas Vollrath, MD, PhD
associate professor
genetics



Brian Wandell, PhD
Isaac and Madeline Stein
Family professor
psychology



BYERS EYE INSTITUTE LOCATIONS

CLINICAL CARE:

Byers Eye Institute, Palo Alto

Adult Clinical Services

Adult Operating Rooms

Pediatric Services

2452 Watson Court

Palo Alto, CA 94303

Stanford Children's Health Pediatric Ophthalmology,

Los Gatos

14601 S. Bascom Ave, Suite 200

Los Gatos, CA 95032

Stanford Children's Health Pediatric Ophthalmology,

Palo Alto

Mary L. Johnson Specialty Services Building

730 Welch Road, 1st Floor

Palo Alto, CA 94304

For adult clinical appointments, call (650) 723-6995.

For pediatric clinical appointments, call (650) 723-1143.

RESEARCH:

Mary M. and Sash A. Spencer Center for Vision Research:

Basic/Translational Research

1651 Page Mill Road

Palo Alto, CA 94304

Mary M. and Sash A. Spencer Center for Vision Research:

Clinical Trials and Translational Research

2370 Watson Court

Palo Alto, CA 94303

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