Envisioning a world without blindness

GLOBAL OPHTHALMOLOGY OUTREACH AND INNOVATION
More than 250 million people can’t see the world around them. Globally, 217 million men, women, and children are visually impaired. Another 36 million, or one in every 25, cannot see at all. Blind people are three times more likely than others to suffer depression or anxiety disorders, three times more likely to be unemployed, and twice as likely to be injured in a fall. Stanford is committed to changing this picture. We have the intellectual talent, expertise in innovation and technology, and the network of industry and international collaborators needed to provide vision care to end blindness around the world.

“When one person loses their sight, it takes two people out of the community,” said Jeff Goldberg, MD, PhD, Professor and Chair of Ophthalmology at Stanford’s Byers Eye Institute. “In under-developed countries, there aren’t well-funded centers for the blind, or guide dogs. There aren’t always regular streets where you could use a walking stick, so blind people often become isolated and caregiving becomes an overwhelming, full-time job.”

And much of the suffering is unnecessary. More than 80 percent of visual impairments can be avoided if diagnosed and treated early. Cataracts, for example, which are a clouding of the lens that causes more than half the world’s blindness, can be easily fixed. “We have plenty of diseases where we have to do more research,” Dr. Goldberg said. “But the number one cause of blindness in the world is cataract surgery, and it’s 100 percent treatable. It’s just a question of disseminating the talent and technology.”

We send ophthalmologists all over the world to fight blindness. Stanford is excited to partner with the Himalayan Cataract Project (HCP), in 1995. In the years since, the nonprofit organization and its collaborators have provided screenings to nearly nine million individuals and sight-restoring surgeries to more than 700,000 throughout the Himalayas and Africa, while also training more than 300 ophthalmic personnel from 19 countries. As academic Foundation for HCP, Stanford sends faculty and residents to remote locations around the world to treat patients and to train and advise local providers. Our faculty is devoted to researching innovative ways to make our outstanding program sustainable and to provide training opportunities for doctors from Asia and Africa to come to our campus to learn the latest surgical techniques. At Stanford, our goal is to partner with national and international collaborators across academia and industry to amplify the impact of what we can achieve together with HCP to end preventable blindness globally.

Himalayan Cataract Project

Geoff Tabin, MD, (pictured on front cover) the Fairweather Foundation Professor of Ophthalmology, traveled to Nepal as both a climber and a doctor. The fourth person in the world to sum the highest peaks on all seven continents, he worked in a Nepalese hospital in the late 1980s. At the time, one percent of the Nepalese population was blind, and for most of those people, the cause was cataracts, a clouding of the eye’s natural lens. While corrective surgery is a simple outpatient procedure in most of America, cataract was catastrophic for the Nepalese villagers, who went blind and could not longer work or contribute to their families and communities.

Dr. Tabin joined forces with Nepalese ophthalmologist Sanduk Ruit, MD, to launch the Himalayan Cataract Project (HCP), in 1995. In the years since, the nonprofit organization and its collaborators have provided screenings to nearly nine million individuals and sight-restoring surgeries to more than 700,000 throughout the Himalayas and Africa, while also training more than 300 ophthalmic personnel from 19 countries. As the academic Foundation for HCP, Stanford sends faculty and residents to remote locations around the world to treat patients and to train and advise local providers. Our faculty is devoted to researching innovative ways to make our outstanding program sustainable and to provide training opportunities for doctors from Asia and Africa to come to our campus to learn the latest surgical techniques. At Stanford, our goal is to partner with national and international collaborators across academia and industry to amplify the impact of what we can achieve together with HCP to end preventable blindness globally.

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We created the first eye clinic in San Pedro, Belize, where most lack adequate vision care. Caroline Fisher, MD, clinical assistant professor of ophthalmology, Don Listwin, co-founder of Belzakids.org, and local nonprofit organizations collaborated to build the clinic. Stanford residents and faculty provide free eye exams to local citizens, allowing our residents to gain important experience while providing a critical service to the local population.

We’re developing technologies to improve vision care worldwide. In many areas of medicine, a physician needs a detailed history to diagnose a disease. In ophthalmology, the physician can often look into the eye and identify the problem—which gives us a unique opportunity to use technology, making vision care more accessible to people in underserved areas through telemedicine (see sidebar).

A telemedicine program called SUNDROP, the Stanford University Network of Diagnosis of Retinopathy of Prematurity (ROP), allows premature babies to keep their sight. Darius Moshefghi, MD, the Director of the Vitreoretinal Surgery Fellowship Program and of Pediatric Vitreoretinal Diseases and Surgery, created the technology, protocols and a network of local caregivers in remote locations to work with Stanford. If caught early enough, ROP can be treated, so these caregivers are trained to take a picture of a preemie’s retina and send it to Stanford where experts screen for this overgrowth of blood vessels that causes blindness. Dr. Moshefghi’s research has shown that SUNDROP is more effective than in-person screening by local, less experienced providers. Researchers are currently testing SUNDROP in remote areas around the world, and our goal is to expand this innovative network with the help of philanthropic partners.

A smartphone attachment that takes retinal photos also extends our reach. Developed by David Myung, MD, PhD, and Robert Chang, MD, assistant professors of ophthalmology, the technology is currently used in emergency rooms and primary care clinics, and could be used in endocrinology clinics to identify patients with diabetic-related eye disease, an increasing cause of blindness. They demonstrated its utility in diagnosing a wide swath of eye diseases in Asian villages so remote there are no eye care providers within hundreds of miles.

A future free of blindness requires outstanding future clinicians. As Stanford physicians travel the world treating patients, they train providers in underdeveloped countries to perform exams, cataract surgeries, and other procedures. Stanford also brings international observers here to learn best practices and latest techniques. And we look for efficiencies everywhere. The Himalayan Cataract Project, for example, uses $4 worth of disposable equipment to perform cataract surgery with a 98 percent success rate. In the U.S., we typically use a $150,000 machine to achieve a 99.2 percent success rate. In learning how to deliver more affordable care abroad, we also look for ways to address the underserved populations here in the U.S.

Your philanthropic vision can help millions see. Reaching out across borders and oceans, we’re developing new technologies and training the next generation of vision care specialists to give people everywhere access to proven vision treatments that transform lives. With your help, we’ll scale these programs to address vision problems in multiple countries and continents. Join us, and see how together, we can give millions around the world the joy of sight.

Ophthalmic Innovation Program

Our ophthalmology faculty pioneered the use of nanoparticles in corneal transplants, invented the PASCAL laser for vision treatment, and demonstrated how virtual reality and visual stimulation can revitalize dormant cells in the retina to improve and potentially recover lost vision. Under the leadership of Mark Blumenkranz, MD, and David Myung, MD, PhD, our Ophthalmic Innovation Program explores the intersection of science, medicine, and engineering to increase access to eye care in resource-limited settings across the US and around the world.

Dr. Myung developed a universal adapter that converts any smartphone into an easy-to-use, compact ophthalmic camera in collaboration with Dr. Robert Chang, MD, who studies the use of artificial intelligence in vision care. Dr. Chang secured access to hundreds of thousands of retinal images from Chinese hospitals and is working to determine if an algorithm can learn to identify which images are of healthy retinas and which are not. If a smart phone can take the retinal picture and determine which patients need to see a doctor, the technology can help predict who’s healthy, who’s going to stay healthy, and who’s going to develop eye disease. Dr. Chang’s approach to Precision Health could transform the delivery of eye care.

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Global Ophthalmology Faculty

Jeffrey Goldberg, MD, PhD, Chair of the Department of Ophthalmology and Director of the Mary M. and Sash A. Spencer Center for Vision Research, leads a talented team of physicians, scientists, and educators who are dedicated to combating blindness and preserving sight.

Robert Chang, MD, specializes in glaucoma and cataract surgery. A fellow of the Stanford Center for Innovation in Global Health and a Biodesign Faculty Fellow, Dr. Chang co-invented the EyeGo Smartphone imaging adapter.

Caroline Fisher, MD, Clinical Assistant Professor of Ophthalmology, specializes in cataract and glaucoma surgery, and is Director of the Stanford Belize Vision Clinic.

Darius Moshfeghi, MD, is Director of the Retina Division and the Vitreoretinal Surgery Fellowship Program. The Founder and Director of SUNDROP Telemedicine initiative, he is a world-renowned expert in pediatric retina telemedicine.

David Myung, MD, PhD, Assistant Professor of Ophthalmology, is Co-Director of the Ophthalmic Innovation Program and the Director of Ophthalmologic Telemedicine. He also leads a translational research laboratory.

Geoff Tabin, MD, is Co-Founder and Chairman of the Himalayan Cataract Project. A Professor of Ophthalmology and Global Medicine, he has traveled the world extensively conducting sight restoring surgeries, training local doctors and creating systems to sustain quality eye care in the developing world.

Contact Us

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