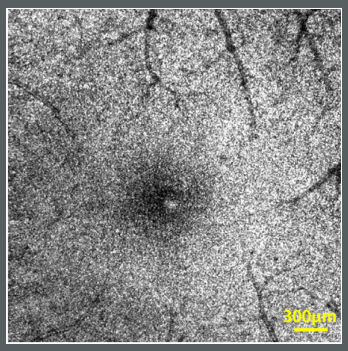
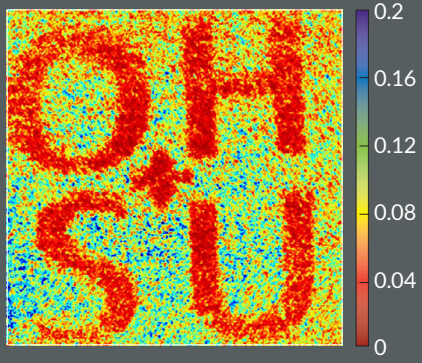


Structural OCT
of central retina

Visual stimulus



OCT-based
optoretinography

Casey Eye Institute Impact Report 2023

Oregon Health & Science University
FOUNDATION

Message from CEI Leadership

2023 was an extraordinary year for Casey, marked by awe-inspiring scientific advances, exceptional educational programs and revolutionary community networks.

Thanks to loyal donors like you, we were able to invest in the people and infrastructure it takes to reach our ultimate goal: to end preventable blindness in Oregon and beyond. As a result of investment in the Elks Children's Eye Clinic, for example, our clinical trials enterprise is ramping up with remarkable speed, setting the stage for yet more breakthroughs and ultimately better options for eye patients everywhere. In May, Casey established the Oregon Vision Health Network, empowering communities across the state to screen patients for common forms of eye disease.

Reflecting back on the last year we are incredibly proud of the way our community combined technical skill, imagination, fortitude and compassion in order to reach our goals.

Andreas K. Lauer, M.D.
Director, Casey Eye Institute
Margaret Thiele Petti and August Petti Chair of Ophthalmology, OHSU School of Medicine

David Huang, M.D., Ph.D.
Associate Director & Director of Research, Casey Eye Institute
Wold Family Endowed Chair in Ophthalmic Imaging

Photography by Jeff Farrell

Casey by the Numbers

762 outreach program screenings

536 free prescription glasses

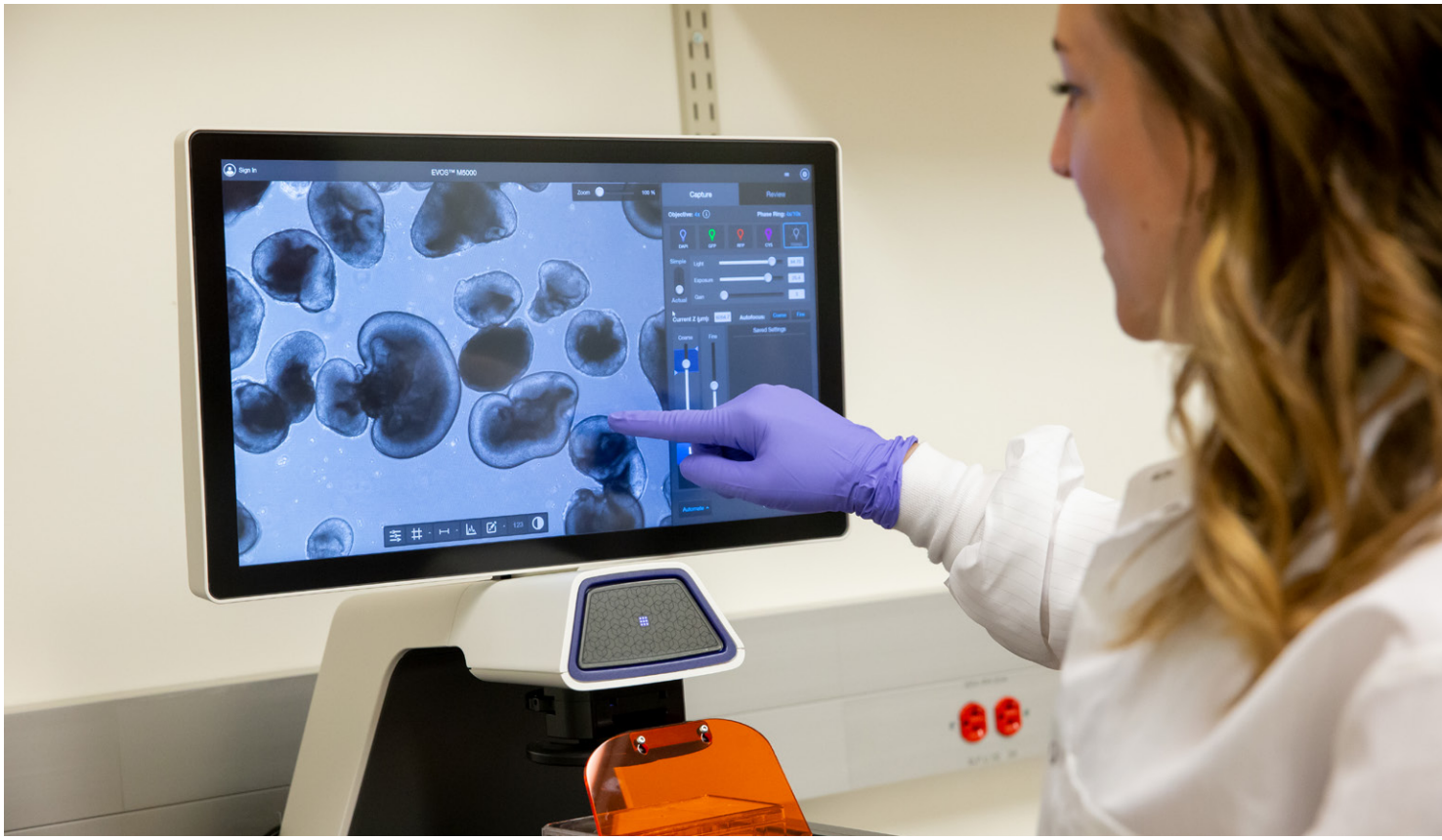
4 new faculty

66 active clinical trials

2,400 emergency and inpatient consults

150,000 patient visits

7,500 surgeries



Research Highlights

Growing live 3D retinas in a petri dish

Inherited retinal disorders are rare, poorly understood and devastating to those who live with them. Right now, there are virtually no treatment options. Casey's new Retinal Stem Cell Center is dedicated to changing that with an intricate process that uses blood cells from patients who carry a genetic disease to create mini retinas in petri dishes, and then examining how those living 3D organoids respond to treatment.

"It's incredible. We give them these cues, and the cells do everything themselves. They assemble themselves into three dimensional spheres and then keep growing and maturing."

— **Katie Chirco, Ph.D.,** assistant professor, Department of Ophthalmology

"Treating patients in clinical trials is very expensive and time consuming. But with hundreds of retinal organoids, we can potentially test hundreds of different drugs. It extends our ability to try new things with no risk to patients."

— **Mark Pennesi, M.D., Ph.D.,** professor in ophthalmic genetics and the chief of Casey's Ophthalmic Genetics Division

The Retinal Stem Cell Center has completed the first phase of its research development plan and is now raising money to fund phase two.

Advancing gene therapy

Mark Pennisi, M.D., Ph.D., led a team that was the first in the world to use subretinal injections to deliver an experimental gene therapy drug (rAAV2tYF-CB-hRS1) to a patient with an inherited retinal disorder known as RS1 x-linked retinoschisis. Without correction, the condition leads to progressive vision loss.

Creating new avenues for innovation

The Elks Children's Eye Clinic houses the state-of-the-art clinical trial spaces that enabled the above research breakthroughs. The new building also frees up space at the original Casey facility, making it possible for yet more teams to develop ambitious research programs. Our ophthalmic plastic surgery division is now a leading recruiter for a national clinical trial, for example, and our glaucoma and neuro-ophthalmology specialists are ramping up more research projects than ever before.

The Power of Philanthropy

Honoring the memory of Malcolm Marquis, M.D. (1931-2021)

Casey created the Malcolm M. Marquis, M.D. Fund to commemorate the late faculty member's exceptional career and generosity. This endowed fund will allow Casey scientists and clinicians to continue to revolutionize the practice of ophthalmology by exploring, innovating and finding new treatments for eye diseases at the discretion of the Casey Eye Institute's Director.

Photography courtesy of Ryan K. Morris and National Science and Technology Medals Foundation

"Dr. Marquis's life-long fascination with innovation shaped his own ophthalmological practice and his philanthropy. We are proud to name a new fund in his honor, in recognition of his generous spirit and passion for advancing vision research."

— **Andreas Lauer, M.D.,** Margaret Thiele-Petti and August Petti Chair of Ophthalmology

Grateful glaucoma patients give back

A Casey patient for many years, the late **Shirley Rippey** (1931 – 2023) well understood the realities of living with glaucoma and the limited treatment options available. She also understood the role philanthropy could play in accelerating innovation and became an enthusiastic supporter of **Dr. John Morrison's** research. Dr. Morrison, a professor of ophthalmology, and his team are experimenting with different devices and materials that will help us understand what causes the eye pressure that leads to glaucoma—and how to relieve it.

Fred Thompson, another grateful patient of Dr. Morrison's, made a gift to establish an endowed professorship in his wife's honor, **The Fred and Joan Thompson Family Professorship.** Morrison was the first holder of the professorship, and used the extra funding provided by the professorship to develop his glaucoma research.

Faculty Recognition

Our extraordinary faculty have garnered serious recognition this year — a testament to our investments in building research capacity and recruiting top-tier people. **Portland Monthly named fifteen of our physicians as top doctors,** including every member of our pediatric ophthalmology team (excluding a new hire).

Congratulations to **David Huang, M.D., Ph.D.,** who recently received two of the nation's highest scientific awards for his work as a co-inventor of the imaging technology called optical coherence tomography, or OCT. In September, Huang and his OCT co-inventors were awarded the 2023 Lasker-DeBakey Clinical Medical Research Award, sometimes referred to as the "U.S. Nobel." In October, Huang and his colleagues were awarded the National Medal of Technology and Innovation by President Biden. OCT was created to prevent blindness and is now also used to diagnose and treat conditions of the heart, brain, skin and more.

Education News

Gaining momentum with simulation

Our ophthalmology residency program has gone through some exciting changes, including the appointment of Daniel Tu, M.D., Ph.D., as the Residency Program Director, and an infusion of new equipment. Residents are now able to hone their skills on five new microscopes in a brand-new wet lab space connected to the surgical simulation lab. They can also use new EyeSi simulation devices — high-end virtual reality simulators for practicing cataract and vitreoretinal surgery. Longtime faculty member and supporter Dr. Joe Matarrazzo provided funds to purchase the EyeSi equipment.

Outreach Update

Extending our reach across Oregon

Casey is leading a revolution in how eye care is delivered, with an expanding array of community programs focused on bringing expert care to everyone in Oregon — and beyond.

In 2023 Casey launched the **Oregon Vision Health Network (OVHN),** comprised of 70 telehealth sites operated by local healthcare agencies across the state. The aim is to increase the eye screening capacity in each location from 40 to up to

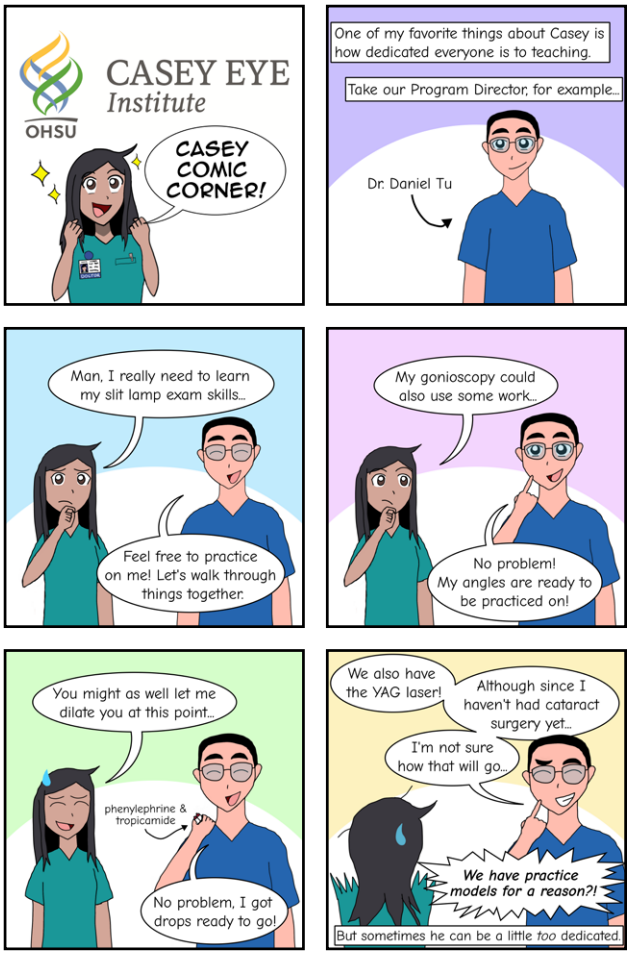


Illustration by @musings_with_meg

500 individuals each year. The network has already provided free vision screening to 762 Oregonians this year. A second mobile eye clinic will hit the road in January 2024, expanding the program's reach yet further. The second mobile clinic will be bigger than the first, providing room for updated imaging equipment and more privacy for patients. OVHN is also bringing more community health workers onboard, training them to conduct screening exams that identify patients who need follow-up care with Casey specialists.

Philanthropic investment was key — the new network received significant support from The Roundhouse Foundation, Heather Killough, S. Page Evans, the Theodore Rutherford Lilley Fund of Oregon Community Foundation and community partners around the state.

Building capacity in American Samoa

Much like in rural Oregon, specialized health care providers are few and far between in American Samoa. With the help of Casey's International Ophthalmology Program, however, this remote U.S. territory is ramping up its eye care infrastructure and ability to detect, prevent and treat the most common eye diseases.

In February, a team led by Casey's Kellyn Bellsmith, M.D., assistant professor of ophthalmology; Allison Bradee, M.D., pediatric ophthalmology fellow; and Mitch Brinks, M.D., M.P.H., associate professor of ophthalmology and director of the Casey Outreach Program, spent a week in American Samoa building a pediatric screening program and improving the equipment and training available for adult eye care.

The team screened 220 children aged three to seven at three elementary schools. Out of those screened, 59 children (27%) were referred for a follow-up exam.

Another primary goal of the trip was to increase the island's capacity to treat eye disease in adults. Now, thanks to the generosity of The Roundhouse Foundation and retired orthopedic surgeon Dr. James Gebhard, the Casey team was able to provide the training and equipment that will make it possible for local providers to treat common conditions, like cataracts and diabetic retinopathy, themselves. The Roundhouse foundation donated an Iridex Argon Laser —the best model available for treating conditions like diabetic retinopathy. Dr. Gebhard donated a phacoemulsification cataract surgery machine. Gebhard's son, ophthalmologist Dr. Nate Gebhard, who works in Casey's Hood River clinic, donated his time to train volunteers.

Serving more young patients in Bend

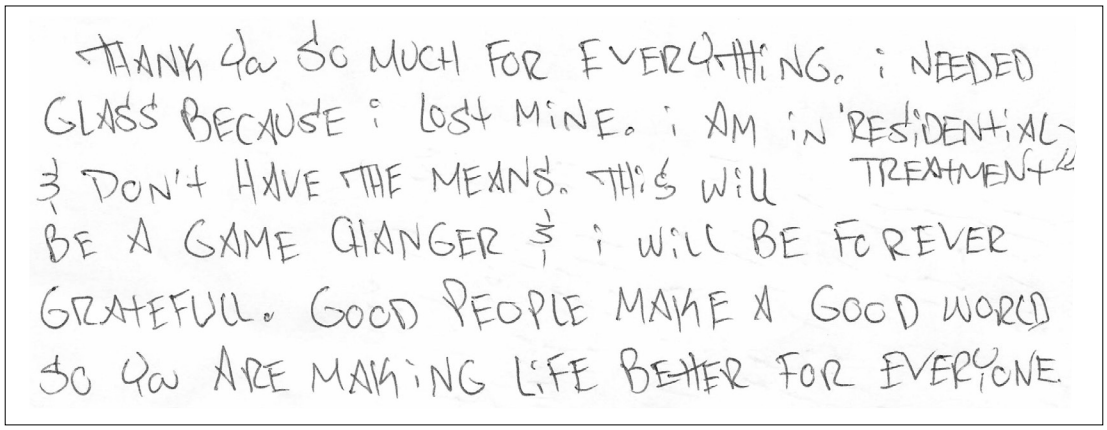
Before our new pediatric ophthalmology clinic opened in Bend in 2022, a Casey ophthalmologist would travel from Portland for appointments two days a month; but that wasn't enough to meet the demand. Now, Casey ophthalmologist John Davis, M.D., sees patients and performs surgery full time in

Bend, and his team continues to add appointment times. "We're filling up with new patients," said Dr. Davis. "We may have to rent another room."

Celebrating two decades of Elks excellence

The Elks Preschool Vision Screening Program celebrated its 20th anniversary this year. Working with Head Starts statewide, the program provides free vision screenings to about 8,000 preschool children in Oregon each year to catch vision problems early. The program has screened 65,000 Oregon children since it launched in 2003. "A screening that lasts just a few seconds can save a child's sight," said program director Joannah Vaughan, M.B.A., who is also an assistant professor of ophthalmology in the OHSU School of Medicine.

In August 2023, we formally celebrated Casey Eye Institute's new Elks Children's Eye Clinic that opened October 2022 in Bend, Oregon. Casey has provided pediatric ophthalmology services in the Bend community for many years by pediatric ophthalmologists and staff travelling between Portland and Bend to offer this care. Now we have Dr. John Davis and a pediatric eye care team who reside in Bend and are seeing patients and their families full-time in the new space. This is another example of the Oregon State Elks Association's commitment to providing vital support to treat and prevent eye disease and blindness in thousands of children. For nearly eight decades, the Elks have contributed more than $40 million and thousands of volunteer hours to Casey, funding pioneering ophthalmology research, establishing preschool eye screening programs throughout the state and providing $20 million to build the Elks Children's Eye Clinic on OHSU's Marquam Hill campus.



THANK YOU SO MUCH FOR EVERYTHING. I NEEDED GLASS BECAUSE I LOST MINE. I AM IN "RESIDENTIAL TREATMENT" & DON'T HAVE THE MEANS. THIS WILL BE A GAME CHANGER & I WILL BE FOREVER GRATEFULL. GOOD PEOPLE MAKE A GOOD WORLD SO YOU ARE MAKING LIFE BETTER FOR EVERYONE.

Handwritten thank you note from participant, 2023

Thank you

We are deeply grateful for the philanthropy that increases Casey's capacity to stop blinding eye disease before it starts. Your generosity allows us to go farther in eye care research to bring new hope to patients and their families, expertly train tomorrow's ophthalmologists to be leaders in the field and provide every pediatric and adult patient with expert and compassionate care. Thank you for helping us preserve the gift of sight.

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