PREVENTION

Glaucoma: Preventing Vision Loss

You can't prevent glaucoma and there is no cure. But early treatment often can halt the damage and prevent vision loss.

About 4.2 million people in the U.S. have glaucoma, the second leading cause of blindness. Half don't know it because there are no symptoms in the initial stages.

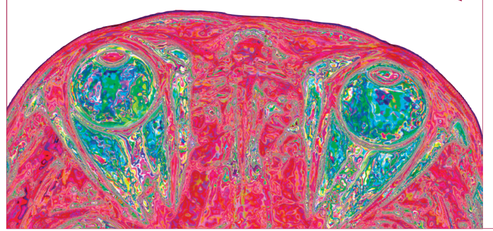
Glaucoma causes elevated eye pressure, which can damage the optic nerve, a bundle of nerve fibers that sends visual messages from your retina to your brain to help you see.

Anyone can get glaucoma, but the risk is higher for women, all people over 60 and Black people over 40.

Guard against vision loss with these precautions:

- Get screened with a comprehensive dilated eye exam. Start with a baseline screening at age 40. If you have a family history of glaucoma, high blood pressure or diabetes, start screening by age 35.
- Your doctor may prescribe medicated eye drops, oral medicine or surgery to reduce your eye pressure. Maintain your recommended medication schedule. Inform your doctor about any side effects.
- Eat a healthy diet with leafy green vegetables and foods with omega-3 fatty acids, such as fish, eggs, nuts and seeds. Maintain a healthy weight.
- Avoid smoking.
- Exercise regularly—ideally 30 minutes a day, five days a week. Moderate walking or jogging can help reduce eye pressure.
- Control your blood pressure.
- Protect your eyes from the sun. Wear Polarized sunglasses and a hat outdoors.

MRI scan of the eyes and parts of the brain, showing the normal structures, including the eyeballs and the optic nerves, along with the lenses and the eye muscles. ◂



MORE MEDICAL WOWS!

Joint Pain Relief?

A gel made of tiny "dancing molecules," created by scientists at Northwestern University in Illinois, stimulates the growth of cartilage, the cushiony material in our joints. Cartilage can wear down with age. The gel was effective in lab tests with human cells and on sheep, with tests on humans ahead.

Cancer Self-Test

Women 30–65 can conduct their own cervical cancer screening with a simple swab at the doctor's office, under new guidelines from the U.S. Preventive Services Task Force. The swab equals the accuracy of a Pap smear by a gynecologist. Next is determining whether home swab tests are doable.

Repair MS Damage

A new drug called PIPE-307 may help repair damage by multiple sclerosis (MS) to the protective coating around nerves (myeline). Scientists at University of California, San Francisco, said the drug may even reverse some effects of MS but needs to be tested in people first.

Weight Loss Diet

A low-fat vegan diet might be even better than the Mediterranean diet for losing weight, says research by the Physicians Committee for Responsible Medicine. Both are healthy diets overall, but after 16 weeks, the vegan diet group lost more weight and had better heart health.

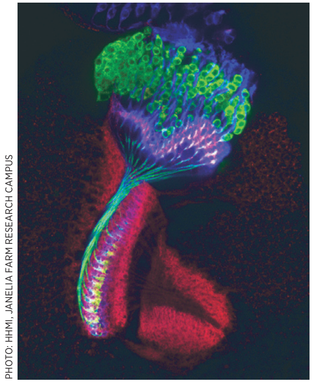


PHOTO: HHMI, JANELIA FARM RESEARCH CAMPUS

▲ *Seen here is the optic lobe of a developing fly. Even this pupa stage contains some form of eye with photoreceptors (in blue) that will convert light into signals sent to the brain.*

Give the Gift of Sight

Whether your interests are in preventing blindness, educating a new generation of ophthalmologic professionals or bringing eye care to the community, you will find expression for your giving here.

Research: You have an opportunity to support our studies in invaluable ways that are not typically funded by traditional sources. We are seeking support for the expense of actually doing research, including data analysis, data storage and publication preparation—costly and time-consuming elements.

Education: Our Ophthalmic Technician Training Program at SCEI is training the next generation of allied healthcare professionals. It's our goal to expand this program to provide more career opportunities for students passionate about providing quality eye care.

Community: Our Vision Van brings critical vision screenings to people who often are unable to seek care due to financial hardship, a lack of transportation or lack of insurance. Your philanthropy can keep our mobile clinic on the road in more neighborhoods.

To support any of these programs, please scan the QR code below using the camera on your cell phone.

DESIGN: STUDIODELUXE.COM COPY: CANDACE PEARSON

SCEI SOUTHERN CALIFORNIA EYE INSTITUTE

For more information about SCEI and our services, contact us at

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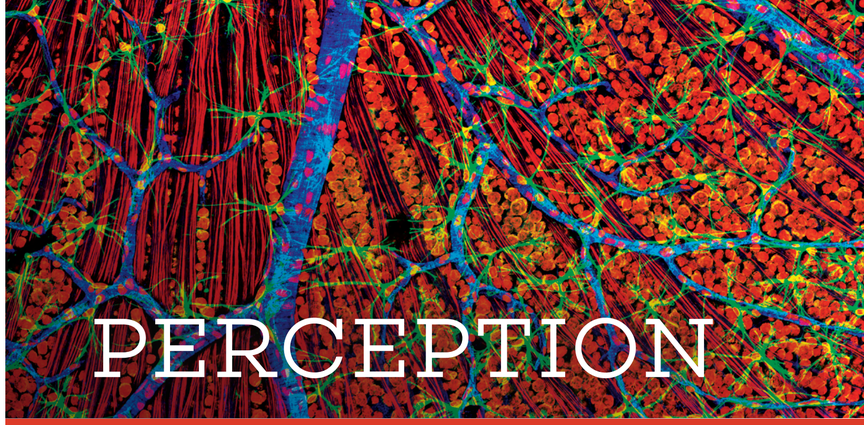
GIVE THE GIFT OF SIGHT



PERCEPTION

SOUTHERN CALIFORNIA EYE INSTITUTE // SPRING 2025

The layer of the retina affected by glaucoma, seen through a light microscope ▲

Groundbreaking Glaucoma Research

A new gene therapy has shown potential for treating glaucoma, an eye condition that damages the optic nerve and can lead to vision loss or blindness.

Scientists at Trinity College Dublin found that gene therapy can protect retinal ganglion cells (RGC), essential for vision, and improve their function in lab studies of glaucoma. It also enhanced energy production in human retinal cells, which could prevent damage to eyesight.

Another gene therapy approach is delivering "neuroprotective" proteins to cells within the retina to aid their survival and slow down or even stop disease progression.

"Additional research lies ahead to explore the promise of these and other strategies," says Rohit Varma, MD, Founding Director of SCEI. "But these are exciting signs of a new future for patients with glaucoma."

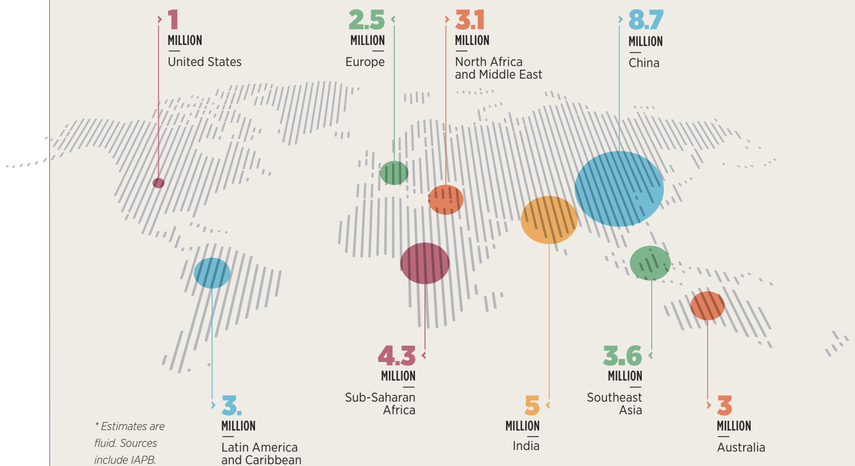
CONTINUED ON THE NEXT PAGE »

We are in an age when new technologies and insights into the origins of eye disease yield promising breakthroughs. We share some of these advances with you in this edition of Perception.

Dr. Rohit Varma
Founding Director, SCEI

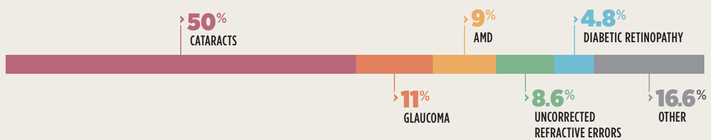
GLOBAL BLINDNESS

43 MILLION PEOPLE IN THE WORLD ARE BLIND.* IMPAIRED VISION AND BLINDNESS ARE A GLOBAL PROBLEM. AS POPULATIONS AGE, TWO CHALLENGES RISE—THE NUMBER OF BLIND PEOPLE AND THE URGENT NEED FOR QUALITY EYE CARE.



** Estimates are fluid. Sources include IAPB.*

CAUSES OF BLINDNESS WORLDWIDE **



BLINDNESS AFFECTS ALL AGES

82% of the blind worldwide are over 50 years old.**

GENDER IMBALANCE

55% FEMALES

45% MALES

Females represent a larger percentage of the blind worldwide.* One reason is longer life expectancy. Another is gender inequity.

THE COST OF VISION LOSS ***

2.2 BILLION
people worldwide have a vision impairment.

$411 BILLION:
annual cost of lost productivity worldwide (2020)

** International Agency for the Prevention of Blindness (IAPB)*
*** U.S. National Institutes of Health*
**** World Health Organization*

Lowering Eye Pressure

In the latest clinical studies, the Calibreye System—a next-generation glaucoma drainage device—has proven to improve control of eye pressure and reduce potentially harmful pressure in patients.

"We are pleased with the results of our ongoing investigations of this innovative device, which will put an invaluable tool in the ophthalmologist's hands," says Dr. Rohit Varma, SCEI's Founding Director and the first glaucoma surgeon to implant the system into a patient.

In glaucoma, the eye's natural fluid (aqueous humor) doesn't drain properly from the front of the eye. Pressure buildup damages the optic nerve and can impair vision. A drainage implant like Calibreye creates an alternative route for the fluid to drain, lowering eye pressure.

Dr. Varma is among authors presenting the Calibreye System findings at ARVO 2025 in Salt Lake City in May, hosted by the Association for Research in Vision and Ophthalmology.

The Calibreye System is designed to help patients with moderate to severe glaucoma.

» **GLAUCOMA**, CONTINUED FROM PAGE 1

Stem Cell Therapies

Progress is being made toward employing stem cells for glaucoma, but the time for safe testing in patients is still to come.

Scientists have identified how to turn human stem cells in the lab into retinal ganglion cells, which carry messages from light receptors in the retina to the brain. Deterioration of RCGs is associated with loss of vision in glaucoma. The goal is to use the healthy RCGs to restore eyesight.

Artificial Intelligence

Artificial intelligence (AI) has proven helpful in screening retinal diseases, such as diabetic retinopathy, because the retina reveals patterns under imaging. Analyzing the optic nerve for glaucoma is more challenging.

Despite that hurdle, AI's talent for processing data in glaucoma studies offers hope for diagnosing the progressive disease earlier. The AI analysis of optic nerve photos can help ophthalmologists identify high-risk changes in a patient's eye.

Innovations in Retinal Diseases

"Treatments for retinal eye diseases are undergoing a sea change," says SCEI's Founding Director Dr. Rohit Varma. "Many studies are still in the laboratory phase; some are already in clinical trials and even restoring eyesight."

GENE THERAPY FOR RETINITIS PIGMENTOSA

A new gene therapy called MCO-010 has shown impressive results in treating retinitis pigmentosa, a rare inherited eye disease.

MCO-010 is programmed to turn retina cells into light-sensing cells to replace photoreceptors lost to the disease. Up to 50% of patients in a clinical trial launched by Nanoscope Therapeutics, Inc., gained three lines of vision on a standard eye chart after treatment.

GENE THERAPY FOR AMD

A new generation of gene therapy could change treatment of age-related macular degeneration (AMD), the American Academy of Ophthalmology said.

One promising technique delivers a working gene into a neuron cell, which prompts the eye to make a novel protein that helps reduce the blood vessel growth under the retina that occurs in wet AMD.

STEM CELL THERAPIES

In a recent study of AMD, investigators used a human retina protein to culture embryonic stem cells to become photoreceptor cells. Researchers in the London Project to Cure Blindness placed a stem cell patch over the back of one eye in two patients with wet AMD—both regained reading vision.

SEEING ALZHEIMER'S

The retina, which has been called "the window into the brain," now may be a window into early detection of Alzheimer's disease before symptoms show.

Alzheimer's disease can begin decades before the first signs of memory loss. So far, treatments only slow down progress. There is no way to stop the disease.

In a 2022 study, researchers noted that a breakdown in the blood vessels of the retina—which converts images to signals and delivers them to the brain via the optic nerve—occurred at the same time similar changes happened in the brain.

In 2024, scientists found that visual sensitivity can decline years before a dementia diagnosis, making the eyes an earlier predictor of dementia than once believed.

Another recent study showed that deposits of beta-amyloid, an abnormal protein, were nine times higher in the retinas of people with Alzheimer's and five times higher in those diagnosed with mild cognitive impairment, compared to those without the disease.

Such discoveries may lead to non-invasive diagnostic methods to detect Alzheimer's in time to intervene.

MRI scan of a human brain and eyes, showing the optic chiasma (the crossing point of the optic nerves).