



EYE OPENERS

**Mason Eye Institute • University of Missouri - Columbia
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GLAUCOMA AWARENESS

Over 3 million Americans have glaucoma. Sadly, over half of the persons with glaucoma do not know they have it, underscoring the aptness of 17th-century poet John Milton's phrase "the sneak thief of sight" to describe his own experience with glaucoma. But blindness is not inevitable in glaucoma. With early diagnosis and treatment, most patients do not have significant vision loss. Dan Schoenleber, M.D., glaucoma specialist at Mason Eye Institute, says that a common reaction of patients when they first learn they have glaucoma is to assume they will eventually go blind. "The reality is that when glaucoma is diagnosed early and treatment initiated, patients usually do very well," Dr. Schoenleber said. "With treatment, most patients with glaucoma are able to keep their vision and have a normal life. It's important for patients to continue lifelong treatment and follow their doctor's directions."

ANATOMY OF THE EYE AND GLAUCOMA

Glaucoma is actually a group of eye diseases that have in common damage to the optic nerve usually as a result of elevated intraocular pressure (IOP). Increased IOP compresses the optic nerve, causing nerve cells to die. The IOP is increased in glaucoma because of an imbalance or malfunction in the eye's drainage system.

RISK FACTORS FOR GLAUCOMA

Everyone over the age of 45 is at risk for glaucoma, and the risk rises as people age. The strongest risk factor is IOP elevation. Approximately 5 to 10 million Americans have elevated IOP. African-Americans are at increased risk for glaucoma. It is six to eight times more common in African-Americans than in whites.

The risk of glaucoma is also increased in patients who have taken steroid drugs for a long time or have had a previous eye injury. A blow to the eye, a chemical burn or penetrating injury can lead to glaucoma if the trabecular meshwork is damaged by the injury. Glaucoma can develop soon after the injury or a long time after the injury. "Anyone who has had eye trauma should have regular eye exams," Dr. Schoenleber said.



Photograph provided by National Eye Institute, National Institutes of Health.

A scene as it might be viewed by a person with glaucoma.

HOW THE OPHTHALMOLOGIST DECIDES GLAUCOMA IS PRESENT

Glaucoma is not usually diagnosed on the initial examination, unless it has gone undetected for a number of years in a patient who has not had regular eye examinations. The ophthalmologist may need to examine the eyes over a period of time to document any changes in the eye pressure, peripheral vision and optic nerve. Elevated IOP by itself is not sufficient for the diagnosis of glaucoma. A patient with IOP elevation by itself is said to have ocular hypertension. Sometimes a patient with IOP elevation alone is considered to be a glaucoma suspect.

"A glaucoma suspect is a patient with some of the findings seen in glaucoma but not enough findings to make a definite diagnosis of glaucoma," Dr.

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Schoenleber said. "The patient may have an elevated pressure but totally normal visual field tests. Or the patient may have a normal pressure but an optic nerve that has the appearance of glaucoma. When a doctor tells a patient that glaucoma is suspected, the patient should ask, why is glaucoma suspected? Is it my optic nerve? My visual field? My eye pressure?" Similarly, if a diagnosis of glaucoma is made, patients should ask about their eye pressures, visual fields and the appearance of their optic nerves.

A combination of three tests performed during an eye examination provides information required for the diagnosis of glaucoma. *Tonometry* measures the IOP. The *visual field test* assesses the peripheral vision, an important measure of the health of the optic nerve. *Ophthalmoscopy* (also called *funduscopy* or *fundus examination*) lets the ophthalmologist look at the optic nerve to determine whether it is of normal shape and color. The pupil is dilated to obtain a good view of the optic nerve. Visual field testing provides a map of the peripheral vision, documenting any blind spots that may have developed as a result of glaucoma. Visual field testing can show whether glaucoma is stable or getting worse. Other tests may also be performed to evaluate glaucoma.

TREATMENT AND FOLLOW-UP

There are a variety of treatment options for glaucoma. "Medications are typically the first line of treatment, but if medications don't work, then surgical treatment is available." Dr. Schoenleber said. There are several basic kinds of eye drops for treating glaucoma. Those that help control glaucoma by decreasing the rate at which aqueous fluid flows into the eye and those that increase the rate it flows out of the eye. Sometimes a combination of eye drops is required to treat glaucoma. In some patients, a drug taken by mouth is needed to help reduce the flow of fluid into the eye.

"The most common mistakes patients make after the diagnosis of glaucoma is not using their medicines correctly and not keeping follow-up appointments," Dr. Schoenleber said. "Glaucoma is usually controllable but long-term follow-up and vigilance are required to prevent loss of vision." Regular eye examinations are crucial, both for early detection of glaucoma and for control of the disease. With as many as 50% of persons with glaucoma not knowing that they have it, perhaps the biggest challenge is finding ways to make regular eye examinations a part of everyone's health care.

Eye on Faculty: DAN B. SCHOENLEBER, MD

Dan B. Schoenleber, M.D., is Associate Professor of Clinical Ophthalmology at the Mason Eye Institute. He joined the faculty here in November 1997.

Dr. Schoenleber graduated *Magna Cum Laude* from Kansas State University in May 1977. He earned his medical degree in 1980 from Kansas University Medical School and completed his residency in Ophthalmology at Eastern Virginia Medical School in Norfolk, Virginia in



1984. He then completed a glaucoma fellowship at the Harvard Medical School Massachusetts Eye and Ear Infirmary in Boston in 1985.

Before coming to Columbia, Dr. Schoenleber was Assistant Clinical Professor at Jefferson Medical College at Thomas Jefferson University in Philadelphia, Pennsylvania as well as a physician at the Geisinger Medical Center in Danville, Pennsylvania.

Dr. Schoenleber is board certified in Ophthalmology and is a member of the American Academy of Ophthalmology, American Glaucoma Society, American Medical Association, Chandler Grant Glaucoma Society, and Missouri Society of Eye Physicians and Surgeons.

As a triathlete and the father of three boys, Dr. Schoenleber is also active in the Columbia community and is a member of the Columbia Multisport Club.

For more information regarding Glaucoma, Dr. Schoenleber or the Mason Eye Institute, please visit our website at www.muhealth.org/~ophthalmology.

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Mission of the Mason Eye Institute

The *Mason Eye Institute* is dedicated to providing the highest quality education, research and patient care in ophthalmology. The *Mason Eye Institute* provides leadership that sets standards for excellence in ophthalmology by developing well-trained, competent, compassionate ophthalmologists; expanding knowledge through basic science research and clinical investigations; and providing thorough, compassionate care to our patients, which includes the latest advances in medical eye care.

Thank you to those who have contributed to the furtherance of our mission through your generous gifts.

Linda G. Davis
Director of Development

GIVING SIGHT

THANK YOU for your support of the Mason Eye Institute. Gifts from grateful patients and other friends like you help to support important areas such as:

- Providing care for patients who cannot afford to pay for the cost of their health care.
- Enabling Mason Eye Institute to conduct important research on diseases like glaucoma, macular degeneration, cataract and diabetic retinopathy.
- Funding facilities and programs to train future ophthalmologists.

How You Can Help

There are many ways you can make a difference in the lives of people with vision-related illnesses or injuries. Please consider one of the following special needs:

Patient Care Fund

Mason Eye Institute provides eye care to mid-Missouri residents without regard to insurance status or ability to pay. But many of our less fortunate patients lack the resources to purchase appropriate glasses or low-vision aids. A gift of \$50, \$100 or more to our Patient Care Fund helps purchase these and other items for patients who will otherwise not have them.

Resident Education Fund

The future of ophthalmology lies in the hands of the young physicians who train in ophthalmology. Each year we have the pleasure of meeting three new doctors who have chosen ophthalmology as their specialty and who will train with our faculty physicians for the next three years. At all times, we have nine resident physicians on staff at the Mason Eye Institute. We must ensure that we pass on to these young people the most up-to-date medical information possible and provide them with state-of-the-art equipment with which to hone their skills. Your gift of \$1,000 or more to our Resident Education Fund helps purchase learning materials, equipment and seminar opportunities for budding ophthalmologists who may someday care for your eyes.

Special Equipment Fund

Remarkable new technology is available to dramatically improve the quality of patient care as well as research into the causes of vision loss. Unfortunately, revenue from patient visits is not sufficient to fund much of the latest and most important equipment. Private gifts are vitally important in helping our physicians and researchers provide more accurate diagnoses, treatment and cures. A detailed list of our current equipment needs is online at www.muhealth.org/~ophthalmology. A punctuated list of equipment needs is provided here:

Keratometers for corneal exam rooms - for greater patient care. A keratometer, also known as a ophthalmometer, is a diagnostic instrument for measuring the curvature of the anterior surface of the cornea, particularly for assessing the extent and axis of astigmatism. The approximate cost for one keratometer is \$1,000.

Autorefractor - for greater patient care. An autorefractor is a computer-controlled machine used during an eye examination to provide an objective measurement of a person's eyeglass or contact lens prescription. The approximate cost for this item is \$12,000.

Inverted fluorescence microscope - for use in research of bone marrow stem cell therapy. This microscope would be used to examine cultured cells for the expression of fluorescent proteins and to examine binding of fluorescently tagged antibodies to human cells. The approximate cost for this item is \$35,000.

For more information on ways you can give, contact Linda Davis at (573) 882-1020 or davislg@health.missouri.edu.

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Mason Eye Institute Faculty

John W. Cowden, MD

Dr. Cowden is the chairman of the Department of Ophthalmology and specializes in cornea and external diseases of the eye. He performs cataract, refractive surgery and corneal transplant surgery.

Jeffrey M. Gamble, OD

Dr. Gamble joined the Mason Eye Institute as a clinical instructor in April 2007. He is an optometrist who specializes in contact lens fitting and keratoconus.

Joseph Giangiacomo, MD

Dr. Giangiacomo specializes in pediatric ophthalmology and pediatric and adult strabismus. He is also chief of staff for University of Missouri Health Care.

Dean P. Hainsworth, MD

Dr. Hainsworth specializes in retina and vitreous diseases. His current research includes macular degeneration and diabetic retinopathy.

Lenworth N. Johnson, MD

Dr. Johnson specializes in neuro-ophthalmology (diseases/disorders involving the eye and brain). As Residency Program Director, Dr. Johnson also oversees the education of the Ophthalmology resident physicians.

Martin L. Katz, PhD

Dr. Katz is currently involved in metabolic disease research, specifically in the study of neuronal ceroid lipofuscinosis (NCL), an inherited metabolic disease that affects nerve cells and ultimately causes blindness.

Bo Lei, MD, PhD

Dr. Lei specializes in electrophysiology (the electrical properties of cells), and his current research includes

retinal degenerative diseases. He maintains a joint appointment with the College of Veterinary Medicine.

Don Liu, MD

Dr. Liu specializes in oculoplastic surgery and orbital trauma. His clinical interests also include orbital and periorbital tumors, lacrimal disorders, eyelid reanimation, and socket reconstruction.

Timothy D. McGarity, MD

Dr. McGarity began his practice in general ophthalmology at Mason Eye Institute and Moberly Eye Institute in July 2006. He covers resident physician staffing at the VA Eye Clinic, and his clinical interests are in cataract and refractive surgery.

Rajiv R. Mohan, PhD

Joining the Mason Eye Institute faculty roster in 2006, Dr. Mohan brought with him his research expertise in corneal gene therapy and corneal wound healing in association with refractive laser surgery. He has a joint appointment with the College of Veterinary Medicine.

Kristina Narfström, DVM, PhD

Dr. Narfström's research in veterinary ophthalmology concerns mainly the characterization of hereditary retinal blinding diseases in cats and dogs that have their counterparts in humans. Her recent work with microchips successfully implanted in the eyes of blind cats to help them see has enjoyed much publicity.

Beryl J. Ortwerth, PhD

Dr. Ortwerth has distinguished himself over the past 30 years with work he has performed as part of an

ongoing National Institutes of Health (NIH) grant for cataract research.

Lixing W. Reneker, PhD

Dr. Reneker's current research focuses on the molecular mechanisms that control lens and corneal development. Her interest is in using transgenic mouse models to understand pathogenesis of human ocular diseases.

Frank G. Rieger, III, MD

Dr. Rieger specializes in cornea and external diseases of the eye, as well as cataract surgery. He serves patients in Columbia and the outreach clinic in Boonville located at Cooper County Memorial Hospital.

Dan B. Schoenleber, MD

Dr. Schoenleber, featured in this edition of *Eye Openers*, is a glaucoma specialist.

K. Krishna Sharma, MSc, PhD

Dr. Sharma is director of research for the Department of Ophthalmology. His study involves understanding the molecular basis for lens transparency and cataract development.

Morton Smith, MD

Adjunct Professor Dr. Morton Smith is also professor emeritus at Washington University in St. Louis. Dr. Smith is an ophthalmic pathologist and continues with resident teaching and clinical-pathologic research projects.

Theodore E. Wills, MD

Dr. Wills has been a general ophthalmology specialist for 41 years. His main focus is oversight of associate physician training in the clinical setting.