As many as 12 million people in the United States have adult-related macular degeneration (AMD). AMD is so common that one in six Americans between 55 and 64 years of age have it; one in four Americans between 64 and 74 have it, and one in three Americans over age 75 have it. With the oldest members of the baby boomer generation now approaching their 60s, more and more people will be affected by this disease.

RISK FACTORS AND SYMPTOMS

The term “macula” is used to describe the central region of the retina. This area is behind the pupil and lens, in a straight line to the inner most surface of eyeball. Highly specialized cells called rods and cones reside in the macula and are responsible for fine detail vision and color vision. The macula is the part of the retina that provides the highest visual acuity, allowing us to see sharp detail when we look straight ahead.

The exact cause of AMD is not known. Macular damage is thought to occur when something impedes the rich blood supply to the macula and interferes with the delivery of oxygen and nutrients to this important part of the eye and interferes with the removal of waste products in the macula. Like the heart, the macula may be damaged by narrowed blood vessels from fatty deposits because of high lipid levels or from smoking. A combination of genetic factors and environmental factors are believed to play a role. Risk factors for AMD include older age, a family history of AMD, light-colored eyes, obesity, smoking and the presence of cardiovascular disease and hypertension. Whites are more likely to lose vision from AMD than African Americans, and women are at greater risk than men.

Lifestyle factors may reduce the risk of AMD. Eating a diet high in dark-green leafy vegetables may reduce the risk. Not smoking and not eating a high-fat diet may reduce the risk, as may maintaining good control of high blood pressure.

Vision loss from AMD may not be noticeable in the early stages. The first symptom may be difficulty reading fine print (even with reading glasses on). As AMD progresses, a blurred spot in the center of vision may be noticed or lines may be distorted (see the photographs below).

A common fear among patients with AMD is that the disease will lead to total blindness. Fortunately, although vision loss can progress, this disease never results in a total loss of sight. Rather, the ability to see details, such as those required for reading, driving, or recognizing faces, may be diminished.

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DRY AND WET AMD

There are two types of AMD: dry AMD and wet AMD. The most common type is dry AMD, which accounts for 85% to 90% of cases of AMD. With dry AMD, blood vessels that supply the macula harden with aging and hamper the ability of the blood vessels to transport oxygen and nutrients into the macula and waste products from the macula. As a result, waste products accumulate in the macula and lead to the formation of drusen. The term “drusen” is used to describe yellowish spots of fatty deposits in the macula. These yellowish deposits can be seen on a dilated eye examination. In dry AMD, drusen continue to grow until they cause vision loss. While the presence of drusen increases the risk of AMD, it does not necessarily signal that dry AMD will eventually develop. Drusen in some patients never get large and never lead to dry AMD.

With wet AMD, abnormal blood vessels begin to grow in the layer of tissue beneath the macula. These vessels are fragile and leak fluid into the macula. This type of AMD is called “wet” because of the presence of this fluid in the macula. Loss of vision occurs as more abnormal blood vessels grow and fluid accumulates in the macula. Wet AMD usually progresses faster than dry AMD.

TREATMENT

No treatment is currently available to prevent the development of AMD or to stop its progression. Laser surgery is sometimes used in patients with wet AMD to destroy the abnormal vessels that are leaking fluid into the macula. This may slow the progression of the disease but does not reverse the vision loss. However, only a minority of patients with wet AMD benefit from laser surgery. More recently, medications that can help shrink the new blood vessels and stabilize vision have been used with wet AMD, allowing more hope of retaining vision in this disease. There is no treatment for dry AMD, the most common form.

While vision loss from AMD cannot be restored, the Low Vision Service at MEI can help patients function better in their daily lives with the use of low vision aids. The Low Vision Service offers assessment, recommendations for low vision aids, training and patient education in a relaxed environment. For more information call 573-882-1029.

THE AGE-RELATED EYE DISEASE STUDY 2

A large study sponsored by the National Eye Institute (NEI) will examine the effects of oral supplementation with two types of carotenoids, called lutein and zeaxanthin, and omega-3 long-chain polyunsaturated fatty acids. The antioxidants lutein and zeaxanthin are the two carotenoids that normally accumulate in the macula and may protect the blood vessels in the macula.

Retinal specialist Dean Hainsworth, MD, is leading the study at Mason Eye Institute. Called the Age-Related Eye Disease Study 2 (AREDS 2), this study will begin enrolling patients at Mason Eye Institute in the upcoming months. AREDS 2 is a follow-up to AREDS 1, which was a large NEI study of the use of oral supplementation with vitamin C, vitamin E, beta carotene, zinc and copper in patients with AMD.

The risk of AMD progression was found to be reduced with the use of the oral supplements. Patients eligible for AREDS 2 must be between 50 and 85 years of age and have either a large drusen in both eyes or a large drusen in one eye and advanced AMD in the fellow eye.

If you are interested in enrolling in the study, please call Dr. Dean Hainsworth at 573-882-1029.

Distortion of lines on an Amsler grid, as they may be seen by individual with AMD.
Photographs from National Eye Institute, National Institutes of Health.
Every year, hundreds of grateful patients and friends of the Mason Eye Institute make charitable contributions to support our mission. When you give to the Mason Eye Institute you give the gift of vision to a child, a parent or a friend.

Private gifts often make the difference in the success of a particular program. They may provide funding for important equipment to help diagnose or treat rare eye diseases, or they provide research dollars needed to test a promising concept.

Funds from patient visits and government support provide only a fraction of the resources needed to provide the very best eye care for Missourians. A gift to the Mason Eye Institute can help support some of the areas where help is needed most, such as:

- Care for patients who otherwise could not afford the cost of eye care
- Research on diseases such as glaucoma and macular degeneration
- Facilities and programs that will enable us to provide top-notch patient care and train the brightest ophthalmologists
- Genetic testing for children and other individuals who have inherited eye diseases

Would you consider a gift today to help us stay at the forefront of medical advances in eye care? For more information on ways you can give, contact Linda Davis at 573-882-1020 or simply return the enclosed reply card.

Mason Eye Institute Faculty

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<td>John W. Cowden, MD</td>
<td>Department Chair, Residency Program Director - Cornea</td>
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<tr>
<td>Joseph Giangiacomo, MD</td>
<td>Pediatrics and Adult Strabismus</td>
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<td>Dean P. Hainsworth, MD</td>
<td>Retina/Vitreous</td>
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<td>Lenworth N. Johnson, MD</td>
<td>Neuro-Ophthalmology</td>
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<td>Martin L. Katz, PhD</td>
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<tr>
<td>Bo Lei, PhD</td>
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<td>Mikhail Linetsky, PhD</td>
<td>Diabetic Eye Diseases Research</td>
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<td>Don Liu, MD</td>
<td>Oculoplastics</td>
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<td>Jeffrey M. Gamble, OD</td>
<td>Optometrist</td>
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<td>Timothy D. McGarity, MD</td>
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<td>Beryl J. Ortwerth, PhD</td>
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<td>Lixing W. Reneker, PhD</td>
<td>Lens and Corneal Development Research</td>
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<td>Frank G. Rieger III, MD</td>
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<td>Dan Schoenleber, MD</td>
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<td>K. Krishna Sharma, MSc, PhD</td>
<td>Cataract Research</td>
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<tr>
<td>Morton Smith, MD</td>
<td>Adjunct Pathology Professor, Washington University</td>
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<td>Theodore E. Wills, MD</td>
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To schedule an appointment at the Mason Eye Institute, please call (573) 882-1506.
Eye on Faculty: Dr. John W. Cowden

John W. Cowden, MD, is Chairman of the Mason Eye Institute and Roy E. Mason Distinguished Professor of Ophthalmology. Dr. Cowden has served the Mason Eye Institute since July 1, 1993.

Dr. Cowden earned an undergraduate degree in chemistry from Michigan State University in 1960 and his medical degree in 1964 from the University of Michigan School of Medicine. He completed a residency in ophthalmology at the Walter Reed General Hospital in Washington, D.C. in 1969 and served in the military from 1965 to 1972. In 1973 he completed a fellowship in cornea and external ocular diseases from the University of Florida.

Before coming to Columbia, Dr. Cowden was professor and vice chairman of the Department of Ophthalmology at the Kresge Eye Institute at Wayne State University in Detroit. He also served as president of the Michigan Ophthalmological Society and chairman of the Legislative Affairs Committee.

Dr. Cowden is board certified in ophthalmology and a fellow of the American Academy of Ophthalmology and the American College of Surgeons.
How You Can Help

Gifts from grateful patients and other friends help us provide better care to patients today, and are vitally important to the future of the Mason Eye Institute. Featured on this insert are several items for which the Institute is seeking funding. To learn more about contributing to these projects or to learn how you can support our important work in other ways, please call Linda Davis at (573) 882-1020, or simply fold, seal and return this card.

**Item Needed: Specialized Digital camera**

Diabetic retinopathy is a widespread public health issue. It is the leading cause of blindness in working-age adults in the United States. It can be effectively treated, with preservation of vision in most cases, with laser and surgery treatment.

However, early detection is key, as more advanced disease often does not result in improved vision after treatment, whereas early detection is much more frequently associated with good long-term vision. Unfortunately, the vast majority of diabetic patients do not get annual screening exams to catch the disease early.

**Telehealth** is a method of screening patients near where they live, rather than at centralized clinics. This approach markedly improves the number of patients that can receive diabetic eye screenings and allows earlier treatment that can save vision. A camera that takes a picture of the back of the eye (the retina, where diabetic retinopathy occurs) can be placed at screening sites in rural areas of the state and the photographs read at a central location at the University of Missouri.

Those patients found to be at risk for losing vision can then be seen at Mason Eye Institute for treatment allowing preservation of vision. The approximate cost of this camera is $25,000.

Farce

MASON EYE INSTITUTE
UNIVERSITY OF MISSOURI-COLUMBIA
ONE HOSPITAL DRIVE
COLUMBIA, MO 65201-9984
**Item Needed: Multifocal Electroretinalgram (ERG) and Visual Evoked Potential (VEP) recording system**

This equipment will help physicians make early diagnosis in age-related macular degeneration, diabetic retinopathy and other types of retinal malfunctions.

While the traditional ERG is the recording of a massed potential from the whole retina, the multifocal ERG recording system allows assessment of ERG activity in small areas of the retina. With this method one can record ERGs from hundreds of small retinal areas (100 mm) simultaneously.

Scotomas of only a couple of millimeters in diameter can be mapped and the extent of retinal dysfunction quantified very accurately.

Mason Eye Institute has a visual function diagnosis system that needs to be upgraded to a multifocal ERG system. The approximate cost of this item is $25,000.

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**Item Needed: Real-time PCR unit**

PCR is commonly used in medical and biological research labs for a variety of tasks, such as detection of hereditary diseases, the identification of genetic fingerprints, the diagnosis of infectious diseases, and DNA computing. This unit will be used in our labs to determine gene expression levels in animals. The approximate cost of this item is $15,000.

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**Yes!**

**I would like more information.**

- I would like to learn more (or have questions) about giving to the Mason Eye Institute.

- I would like information on how to include the Mason Eye Institute in my estate plan.

- I would like a free subscription to *Eye Openers*.

- I am interested in participating in the Age-Related Eye Disease Study 2 (as described in the article on Macular Degeneration.) Please contact me.

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Name/s

Address

City/State/Zip

Telephone (optional)

Email (optional)

(Please fold this form so that the Mason Eye Clinic Address faces outside, seal and mail.)