



Age-related macular degeneration and low vision

What is Age-Related Macular Degeneration?

As Americans live longer, the number of people with major eye diseases will increase. According to Prevent Blindness America, age-related macular degeneration (AMD) affects the vision of more than 15 million Americans and is the leading cause of visual impairment of those 55 years and older.¹ It is a chronic, slow, progressive and painless condition that causes the cells in the macula to break down, leading to loss of central vision. The macula is the area of the retina where the photoreceptors are most dense. Like a camera, the retina is the film of the eye which receives images from the other ocular structures. The retina then sends impulses to the brain for interpretation. The macula provides us with central vision and allows us to see fine details such as those on faces, television, computers and books.

There are two types of AMD: dry AMD and wet AMD. Dry AMD occurs when dry yellowish deposits accumulate beneath the macula. It is the less destructive type and accounts for 90 percent of the cases. Dry AMD usually does not cause a total loss of vision but it must be closely monitored. Dry AMD can lead to wet AMD. Wet AMD accounts for 10 percent of the cases and it occurs when tiny abnormal blood vessels begin to grow behind the retina, and leak blood and fluids that damage the macula. A person's quality of vision decreases as the macula deteriorates.

What are the symptoms?

In the early stages of AMD, there may not be any symptoms. In the later stages, a person may notice the following symptoms:

- Objects, print and faces may become blurry, hazy or distorted.
- You may notice a blind spot in the center of your vision.
- You may need more light to read.
- While reading, some of the letters or words may be missing.
- Colors may not seem as vivid.
- Straight lines may appear wavy.

What's your risk of developing AMD?

The main risk factor for developing AMD is age. People older than age 60 are at a greater risk for developing AMD. Other risk factors are sunlight, diet and nutrition, smoking, heredity, gender, race, high blood pressure and diabetes. Caucasians are at a greater risk of developing

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AMD compared to other races. The American Optometric Association and Prevent Blindness America recommend that people can reduce their risk of developing AMD by:

- Protecting their eyes from the sun by wearing sunglasses to limit ultraviolet light exposure. Sunglasses should block out 100 percent of UV light.
- Not smoking — AMD is twice as common in people who smoke.
- Maintaining a nutritionally balanced diet
- Staying active and exercising
- Controlling their blood pressure and cholesterol
- Eating foods or taking supplements that contain antioxidants. Fruits, vegetables and fish will supply the nutrients that are necessary to maintain healthy eyes.
- Avoiding trans-fats. These are found in processed baked goods.
- Receiving routine eye exams from an optometrist or ophthalmologist

Maintaining a healthy lifestyle does not guarantee that you will not develop AMD. Regular eye exams are the only means of detecting and monitoring macular degeneration, as often symptoms go unnoticed. During the exam, your doctor will check your visual acuity and will use a special magnifying lens to look through the pupil of your eye to directly exam your retina. The doctor will look for signs of AMD and other diseases. Early signs of systemic diseases such as hypertension and diabetes can also be detected during a routine eye exam. Early detection may prevent further vision loss, since treatment is only effective when started early. If your eye doctor suspects a problem, further testing will be required. Retinal photography, scanning computerized diagnostic tests and fluorescein angiography may be needed to determine the extent of AMD. Modern technology has improved the level of care provided to people with retinal disease. People older than age 50 should have comprehensive eye exams yearly.

What is the Amsler Grid test?

An effective way to test for AMD is by using an Amsler Grid. Since this test is easily performed, many eye doctors will give their patients one to take home so that they can perform the test on a regular basis.

Follow these simple instructions to use the Amsler Grid:

1. Be sure to wear your bifocals or reading glasses.
2. Hold the grid at your normal reading distance.
3. Cover one eye and then only look at the center dot.
4. While looking at the center dot, all of the lines should appear straight and all of the squares should be the same.
5. Perform the test for each eye separately, not with both eyes open at the same time.

If any of the lines or squares appears blurred or distorted, you should contact your eye doctor immediately. This could mean that there is a distorted area in your macula. However, many patients with macular degeneration have no symptoms and could still pass this test. The only way to ensure that you are not developing AMD is to be examined by your eye care provider.

How can proper nutrition slow the progression of AMD?

It is very important for you and your optometrist or ophthalmologist to discuss the role nutrition plays in slowing down the progression of AMD. The landmark Age-Related Eye Disease Study (AREDS) revealed the role that nutritional supplements play in preventing and slowing the progression of AMD. This study was a clinical trial sponsored by The National Eye Institute of The National Institutes of Health. AREDS findings indicated that patients lowered their risk of developing advanced AMD by about 25 percent when

treated with a high-dose combination of vitamin C, vitamin E, beta-carotene, zinc and copper. The study also found that there was a 19 percent reduction in the risk of vision loss among moderate to advanced AMD patients when this vitamin supplement was taken.² You cannot achieve these levels of vitamins, antioxidants and zinc in your daily food consumption. Smokers should not take beta-carotene because studies have shown a link between beta-carotene use and lung cancer among smokers. And, a daily multivitamin alone does not provide the same levels of antioxidants and zinc that are in the AREDS formulation. The AREDS vitamin supplement is available over-the-counter at most food and drug stores. If you are already taking a multivitamin, be sure to discuss all supplements with your primary physician before beginning the AREDS formula. The AREDS formula is intended for those who have not already been diagnosed with AMD. But the manufacturers of the AREDS vitamins also make an eye-health formula specifically formulated with essential nutrients to support ocular health, but in lower doses than the AREDS formula. If you have early states of AMD you should discuss with your eye doctor or medical doctor the advantages of taking this formula.

Several studies on AMD are focusing on the role of a group of antioxidants called carotenoids. Carotenoids are the pigments that give fruit and vegetables their color. Two of these carotenoids, lutein and zeaxanthin, are the only pigments found in the macula. Yellow and green vegetables are rich in the nutrients lutein and zeaxanthin and research shows that their consumption may help people avoid AMD. A study at Harvard University found that 6 mg per day of lutein leads to a 43 percent lower risk for macular degeneration.³ Some of the foods rich in lutein and zeaxanthin are spinach, kale, turnip greens, Brussels sprouts, leaf lettuce, collard greens, squash, green peas, broccoli, beans and corn.

People who eat fish two to three times a week have a lower risk of developing AMD. Wild salmon and sardines provide good sources of omega-3 fatty acid which is important for ocular health. People who eat lots of saturated fats have an increased risk of developing AMD.⁴

According to the U.S. Assistant Surgeon General, obesity is the fastest growing epidemic in America, and obesity affects ocular as well as systemic health. Ocular complications of obesity include diabetic retinopathy, cataracts, glaucoma and macular degeneration. Obesity increases the risk of progressing from early stages of AMD to advanced stages.⁵

What treatment options are available?

If you develop wet AMD, there are treatments that can limit the loss of vision, if caught early. They are:

- Laser photocoagulation — A laser beam is used to seal leaky blood vessels. This only helps in a small percentage of wet AMD cases.
- Photodynamic therapy — A light activated drug, Visudyne®, is injected into the bloodstream. Once the drug reaches the retina it is activated by a laser. This produces a clot that closes the abnormal blood vessel.
- Anti-VEGF injections — The current drugs available are Avastin®, Lucentis® and Macugen®. One of these drugs is injected into the eye once a month over the course of many months. These drugs block new blood vessel growth and prevent leakage.

We can't prevent AMD, but the effects of AMD can be minimized through early detection and treatment. If you develop AMD, a comprehensive dilated eye exam every year can determine if the disease is progressing. Your eye doctor can discuss with you the treatment options and the available over-the-counter multivitamin/mineral and eye health supplements containing antioxidants. Your doctor should encourage you to eat more fruits, vegetables, fish and beans. Maintaining a healthy lifestyle will help reduce your risk of developing AMD.

What is low vision?

Some visual changes caused by AMD and other eye diseases are not always correctable with eyeglasses, contact lenses, medicine or surgery. These visual problems could result in permanent vision loss. If the vision loss is total, the result is blindness. If it is partial, the result is a vision impairment known as low vision. People with low vision retain some usable vision. Low vision rehabilitation helps a person utilize his or her remaining functional vision.

A visual impairment can cause disability by interfering with one's ability to function independently and to perform activities of daily living. Besides AMD, other common causes of visual impairment are cataracts, glaucoma and diabetic retinopathy.



Special eye care services — beyond what is covered by a vision plan — may be required. Those additional tests and therapy may be covered by a person's medical insurance. Testing is done to quantify the remaining visual abilities for the purpose of determining the visual rehabilitation plan. The goal of the primary care optometrist or ophthalmologist should be to provide basic low vision care and to prescribe aid in the form of high-powered near or multifocal additions. Management of patients with severe low vision may require referral to an eye care provider skilled in low vision rehabilitation.

Low vision therapy is a system that uses optical and nonoptical aids, with instruction and rehabilitation, to help a person use his or her residual vision. It is not a surgical procedure. Low vision therapy uses a combination of lenses, prisms and lighting techniques to use the parts of the retina that are still functioning. It makes the best use of a person's vision potential.

Visual impairment can also be the result of peripheral vision loss. People with peripheral vision loss may have more difficulty navigating through the world than people with reduced central acuity and no peripheral field loss. Low vision optical devices and training can often improve awareness of the surroundings, allowing for independent travel by the patient. A referral to an orientation and mobility specialist may be required. Psychological counseling may be recommended to improve the person's ability to cope with vision loss.

A misconception about low vision aids is that there is going to be one pair of glasses that will solve the visual impairment problem. Typically, more than one device is needed, such as:

- High-powered reading glasses
- Handheld and spectacle-mounted telescopic lens systems
- Handheld and/or stand magnifiers
- Closed-circuit television systems
- Video magnification units worn on the head
- Computers

Telescopic systems are best suited for viewing distant objects such as street signs. Many U.S. motor vehicle agencies have sanctioned the use of these systems for driving. Magnifiers are small and portable and are used to magnify reading material. Closed-circuit televisions provide increased magnification and contrast of books, magazines and newspapers. Most low-vision patients do very well with these devices.

Visually impaired children are often delayed in the areas of gross and fine motor skills. For students, the inability to read standard-size print, to see the chalkboard or to see computer screens can have an impact on their educational and social development.

As we get older, changes in our eyes and vision occur. Your eye doctor can determine if your vision changes are normal or if they are the result of an ocular disease. Optometrists and ophthalmologists are experts in detecting and managing ocular diseases. They are gatekeepers for those requiring AMD management and low vision services. If AMD progresses to partial vision loss, your doctor can discuss all of the available low vision aids to determine which ones will be most useful to you. Your eye doctor can direct you to a low vision specialist and give you information about available government and private programs. There is no cure, but there are treatment options that can improve your quality of life.

Sources:

- ¹ www.preventblindness.org
- ² www.nei.nih.gov/amd
- ³ www.macular.org/nutrition/lutein.html
- ⁴ www.amd.org
- ⁵ www.nei.nih.gov/health

Additional Resources:

- www.nei.nih.gov/health
- www.preventblindness.org
- www.aoa.org
- www.bpei.med.miami.edu
- www.amd.org
- www.macular.org
- www.retinaphysicians.com
- www.lowvision.com

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