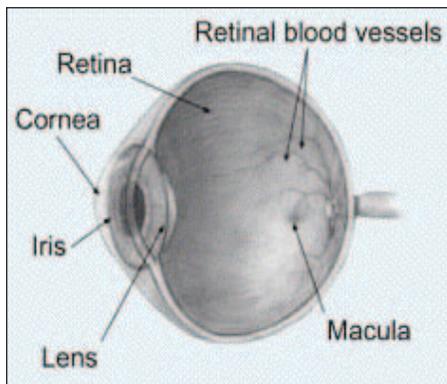


Macular Degeneration

Age-related macular degeneration (AMD) is damage or breakdown of the macula. The macula is a small area at the back of the eye that allows us to see fine detail clearly. When the macula doesn't function correctly, we experience blurriness or darkness in the center of our vision. Age-related macular degeneration affects both distance and near vision, and can make some activities like threading a needle or reading very difficult or totally impossible.



When the macula is damaged it results in extreme loss of central vision. Since the peripheral retina is not involved macular degeneration does not lead to complete blindness.

The risk of AMD significantly increases with age. In fact, people between ages 64 and 74 have a one in four chance of developing the disease. Over the age of 75, the chances increase to one in three. Many seniors already have AMD and don't even know it.

A visit to your eye care professional is the greatest defense in helping to preserve your vision.



Normal Vision



Age-related Macular Degeneration

AMD can also occur during middle age. Other risk factors include:

- **Gender** – Women tend to be at greater risk for AMD than men.
- **Race** – Whites are much more likely to lose vision from AMD than Blacks.
- **Smoking** – Smoking may increase the risk of AMD.
- **Obesity** – Research studies suggest a link between obesity and the progression of early and intermediate stages of AMD to advanced stages.
- **Family History** – Those with immediate family members who have AMD are at a higher risk of developing the disease.
- **Sunlight** – Cumulative exposure to ultraviolet light may contribute to a higher risk of AMD.

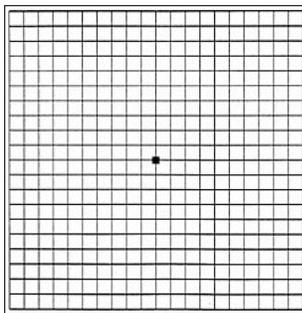
There are two forms of this disease:

- **Dry AMD** – Ninety percent of all people with AMD have this type. Scientists are still not sure what causes dry AMD. Studies suggest that an area of the retina becomes diseased, leading to the slow breakdown of the light-sensing cells in the macula and a gradual loss of central vision.
- **Wet AMD** – Although only 10% of all people with AMD have this type, it accounts for 90% of all blindness from the disease. As dry AMD worsens, new blood vessels may begin to grow and cause “wet” AMD. Because these new blood vessels tend to be very fragile, they will often leak blood and fluid under the macula. This causes rapid damage to the macula that can lead to the loss of central vision in a short period of time.

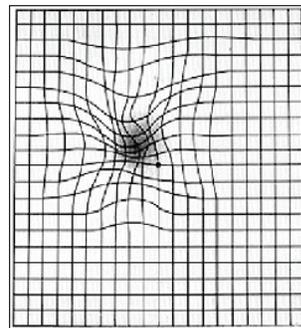
How is AMD detected?

Since macular degeneration is painless and can cause very subtle changes in vision, getting regular comprehensive eye exams from your eye care professional is the only way it can be diagnosed. Your eye care professional may suspect AMD if you are over age 60 and have had recent changes in your central vision. To look for signs of the disease, he or she will dilate the pupils in order to see details of the macula. You may also be asked to view an **Amsler grid**, a pattern that looks like a checkerboard. Early changes in your central vision will cause the grid to appear distorted, a sign of AMD.

Do NOT depend on the grid displayed below for any diagnoses.



While covering one eye, look at dot in center of grid. If lines around dot are wavy or distorted, you should see your eye care professional.



Example of advanced AMD

If AMD is suspected, advanced imaging is available for diagnosis. These technologies use laser-generated digital imaging to accurately detect new vessel growth. Older techniques for detection involve injecting a fluorescein dye into the arm and looking at the retinal vessels for leaks while the dye travels through them.

How is dry AMD treated?

Once dry AMD reaches the advanced stage, no form of treatment can prevent vision loss. However, treatment can delay and possibly prevent intermediate AMD from progressing to the advanced stage, in which vision loss occurs. The National Eye Institute’s Age-Related Eye Disease Study (AREDS) found that taking a specific high-dose formulation of antioxidants and zinc significantly reduces the risk of advanced AMD and its associated vision loss. Slowing AMD’s progression from the intermediate stage to the advanced stage will save the vision of many people.

Although the AREDS formula slowed the progression of AMD in about 25% of patients at high risk for the disease, it did not prevent the disease nor slow progression of advanced AMD. The formula included: 25,000 IU beta-carotene, 500 mg vitamin C, 400 IU vitamin E, 80 mg zinc (zinc oxide) and 2 mg copper (cupric oxide).

Nutrition and AMD

There is no substitute for the quality of life good vision offers. Adding certain nutrients to your diet every day - either through foods or supplements - can help save your vision. Researchers have linked eye-friendly nutrients such as **lutein**, **zeaxanthin**, **vitamin C**, **vitamin E**, and **zinc** to reducing the risk of certain eye diseases, including macular degeneration.

Lutein and zeaxanthin are important nutrients found in green leafy vegetables as well as other foods such as eggs. Many studies have shown that lutein and zeaxanthin reduce the risk of chronic eye diseases, including age-related macular degeneration (AMD).

Smoking and AMD

Smokers in the AREDS study had the highest rate of progressing to advanced AMD and severe vision loss. Although the mechanism by which smoking and nicotine have in the development of AMD is not fully understood, the higher risk of vision loss indicates that it is worthwhile to stop smoking as soon as possible.

How is wet AMD treated?

Several treatments have been developed in recent years for wet AMD. However, none offer a cure. Currently, anti-VEGF (Vascular Endothelial Growth Factor) injections are the most effective option. Laser surgery and photodynamic therapy have also been used. Any treatment may slow the rate of vision decline or stop further vision loss, but the disease and loss of vision may progress despite treatment.

- Anti-VEGF injections: The growth of new blood vessels involves Vascular Endothelial Growth Factor. By blocking this protein the new vessel growth is slowed and thus slows down the loss of vision linked to wet AMD. Currently, there are three injections available to use: Lucentis, Avastin and Macugen. The painless injection is given directly to the eye and is done by a specialist
- Photodynamic therapy: A drug called verteporfin is injected into the arm. It travels throughout the body, including the new blood vessels in the eye. The drug tends to “stick” to the surface of new blood vessels. Next, a light is shined into the eye for about 90 seconds. The light activates the drug. The activated drug destroys the new blood vessels and leads to a slower rate of vision decline. Unlike laser surgery, this drug does not destroy surrounding healthy tissue. Because the drug is activated by light, the patient must avoid exposing your skin or eyes to direct sunlight or bright indoor light for five days after treatment. Photodynamic therapy is relatively painless. It takes about 20 minutes and can be performed in a doctor’s office.
- Laser surgery: This procedure uses a laser to destroy the fragile, leaky blood vessels. A high energy beam of light is aimed directly at the new blood vessels and destroys them, preventing further loss of vision. However, laser treatment also may destroy some surrounding healthy tissue and some vision. Only a small percentage of people with wet AMD can be treated with laser surgery. Laser surgery is more effective if the leaky blood vessels have developed away from the fovea, the central part of the macula. Laser surgery is performed in a doctor’s office or eye clinic. The risk of new blood vessels developing after laser treatment is high. Repeated treatments may be necessary. In some cases, vision loss may progress despite repeated treatments.

All treatments may need to be repeated over time. Unfortunately, patients can continue to lose vision even after treatment.