



MACULAR DEGENERATION

What is the macula?

The macula is a specific area of the retina. It is at the center of the visual field—when looking directly at an object, you are seeing it with the macula, while the rest of the retina provides peripheral vision. Although it represents only a small fraction of the total size of the retina—about the size of the capital letter “O” on this page—the macula is crucial for visually demanding tasks like reading, driving a car, and color vision. Diseases of the macula may interfere with “detail vision”, making these activities more difficult. Macular problems can also cause images to appear distorted, or may cause an area of cloudiness or darkness to form at the center of the visual field. Fortunately, many diseases that affect the tiny macula may spare the rest of the retina, thereby preserving peripheral vision. Therefore, diseases such as Age Related Macular Degeneration (ARMD) rarely result in complete loss of sight.

What is degeneration of the macula?

In some individuals, tiny dot-like deposits (known as drusen) slowly accumulate beneath the macula. While these deposits usually do not cause visual loss directly, they indicate that the patient is at risk for developing further problems with the macula. Usually, these deposits would not be apparent before the age of 50.

Visual problems in macular degeneration take two basic forms. The first, milder problem occurs as the cells of the macula slowly lose sensitivity and may become less numerous. This may result in fluctuating vision—the sight is clearer on some days than others—and slowly (typically over months to years) vision may worsen. This is referred to as the “dry” form of macular degeneration.

The second type of problem occurs more suddenly and may cause a more serious drop in vision. Tiny clusters of abnormal blood vessels may begin to grow beneath the macula. These vessels “leak” and blood or watery fluid may accumulate beneath the macula. This can result in irreversible damage to the macula, resulting in loss of the central detail vision. The presence of leaks is often referred to as the “wet” form of macular degeneration.

If these vessels can be identified at an early stage, and they are outside the exact center of the macula, it may be possible to seal them with laser treatment. In most cases, however, laser cannot be used because the vessels have already spread too far, or the exact location of the leak cannot be found. Fortunately, there are some newer treatments that offer greater hope for vision improvement despite the limitations of laser treatment.

Why does macular degeneration occur? What can be done to prevent macular degeneration?

While the most important risk factor for macular degeneration is age, it is not yet understood why macular degeneration occurs in some seniors and not in others.

There may be some inherited **factor that** predisposes individuals to have this condition, and research to identify the genes which are associated with macular degeneration is ongoing. The development of drusen, and the slow loss of retina cells that sometimes occurs, is not preventable by any means yet identified. However if the genetic basis of macular degeneration was identified, it might be possible to correct the defect before macular degeneration can begin. Many researchers are working on this question, but it remains a difficult problem.

If a person has macular degeneration, it appears that keeping the entire body healthy—control of blood pressure, control of cholesterol, good nutrition, and avoiding cigarettes—helps to reduce the risk of developing visual loss. The Age-Related Eye Disease Study (AREDS) was a major study sponsored by the National Eye Institute (NEI). In the study, scientists looked at the effects of zinc and antioxidants (vitamin C, vitamin E & beta carotene i.e. provitamin-A), on patients with cataracts and age-related macular degeneration (AMD). Patients with intermediate to advanced AMD, as determined by the doctor, who were taking the anti-oxidant and zinc combination had a demonstrable decrease in the incidence of developing wet AMD

While most patients in the study experienced no serious side effects from the doses of zinc and antioxidants used, a few taking zinc alone had urinary tract problems that required hospitalization. Some patients taking large doses of antioxidants experienced some yellowing of the skin. The long-term effects of taking large doses of these supplements are still unknown. Previous studies have shown that individuals who smoke and take beta-carotene are at an even greater risk of developing lung cancer, and therefore **current and recent smokers should not take beta-carotene.**

If you have intermediate (or advanced macular degeneration in one eye only), talk to your physician about taking nutritional supplements. Your doctor can help you determine if they may be beneficial-and safe-for you, and what types and doses of supplements to take. The doses used in the study were: Vitamin C 500 mg, Vitamin E 400 IU, Beta-carotene 15 mg, Zinc 80 mg, as zinc oxide, Copper 2 mg, as cupric oxide (copper should be taken with zinc, because high-dose zinc is associated with copper deficiency).

An **additional** factor that may aggravate macular degeneration is unprotected exposure to the sun's UV rays. **While this is not yet proven, most patients find some form of sunglass use (with UV filtration) makes seeing more comfortable and in some cases, certain tints can enhance contrast sensitivity.**

How is macular degeneration treated?

There is no treatment for dry AMD, except for vitamin supplementation, as described above if recommended by your doctor. There are some treatments for wet AMD, but whether or not you are a candidate for treatment depends on the type, location, severity and chronicity of the leak. Most traditional treatments (such as laser) are best at stabilizing the vision or slowing the progression of vision loss, rather than restoring vision. However, there are several new, exciting treatments (including medicines that can be directly injected into the eye) that in many cases, but not all, vision can possibly be restored in the early stages of the disease.

What should I watch for?

Your doctor will schedule regular follow-up appointments to monitor your condition. In addition, we strongly recommend monitoring your vision with an Amsler grid (see below) at least twice a week, so that any changes in vision will be recognized as early as possible. Instructions on how to use the grid will be provided.

Any changes on the Amsler grid—waviness of the lines, blank or missing lines, or blurring of the lines—should be reported to your doctor immediately. Early detection is our best defense against visual loss in macular degeneration!

