Guide to Macular Degeneration

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In people over age 50, age-related macular degeneration (AMD) is the leading cause of severe, irreversible loss of central vision. As the name suggests, the prevalence of severe visual loss from AMD increases with age, and most people with visual impairment owing to AMD are 60 or older.

The macula is the central and most sensitive portion of the retina, the layer of tissue in the back of the eye that contains the light-receptive cells essential for sight. In age-related macular degeneration, central vision and the ability to distinguish fine detail may become increasingly impaired, but peripheral vision remains unaffected. If macular function is lost completely, activities such as reading become quite difficult without the assistance of low vision aids.

Non-neovascular age-related macular degeneration (AMD) is characterized by the formation of drusen (debris) under the retina. Neovascular AMD is characterized by the development of abnormal blood vessels that leak blood and fluid beneath the retina.
There are two forms of age-related macular degeneration: “dry” (also known as nonneovascular or atrophic) and “wet” (neovascular). About 90 percent of those with age-related macular degeneration have the dry form.

Although irreversible, many patients with dry macular degeneration may not experience any symptoms or may only experience gradual and minimal changes in their vision clarity. A small fraction of people with dry macular degeneration experience severe vision loss. In wet macular degeneration, however, fine blood vessels at the back of the eye proliferate and leak fluid and blood. This neovascular tissue leads to dense scarring of the macula with permanent, significant central vision loss within weeks to months. Wet macular degeneration may develop suddenly in patients with dry macular degeneration. Both forms of macular degeneration are painless and the condition typically affects both eyes.
Most AMD patients are asymptomatic. When symptoms occur, they usually present as an otherwise unexplained distortion of objects and mild loss of visual acuity that develops gradually (non-neovascular); less often symptoms can be severe and occur in a matter of days or weeks (neovascular). A grayness, haziness, or blank spot may appear in the area of central vision; words may be blurred on a page; straight lines may appear to have a kink in them; and objects may seem smaller than they are. Alternatively, color vision may become dimmer, since the receptors involved in color discrimination (cones) are most dense in the fovea.

- Increasingly blurred central vision.
- Haziness, grayness, or blank spots in the central field of vision.
- Visual distortion: Straight lines appear bent; objects may appear smaller than in actuality.
- Difficulty with reading, doing close work, or driving.

**What Causes Age-Related Macular Degeneration?**
The cause is unknown, although aging is clearly a risk factor. Some evidence of age-related macular degeneration can be detected in approximately one-quarter of all people over the age of 65 and in one-third of those over age 80.

Other risk factors include hyperopia (farsightedness), cigarette smoking, light-colored eyes, and a family history of age-related macular degeneration. High blood pressure, lifetime sunlight exposure, dietary factors, and genetic susceptibility may increase the risk for the wet form of age-related macular degeneration.

**Diagnosis of Age-Related Macular Degeneration**
Non-neovascular AMD is diagnosed when the ophthalmologist observes drusen or other pigment changes in the macula. Neovascular AMD is suspected when a person notes the onset of new symptoms and an eye examination shows an exudate (fluid deposit) or hemorrhage in the macular area.

The diagnosis is confirmed by fluorescein angiography, an examination of blood vessels after a special dye, called fluorescein, is
Symptoms of Age-Related Macular Degeneration

injected into a vein in the arm; photographs of the retina are taken as the dye circulates through the blood vessels of the eye. This test must be performed and interpreted promptly because the disorder can progress within days.

Hold the grid (top illustration) at reading distance and fix one eye on its center; cover the other eye. Distorted or wavy lines (bottom) indicate AMD.
How To Treat Age-Related Macular Degeneration

Neovascular AMD can only be treated about 20 percent of the time, though many low-vision aids can help patients go about their daily activities despite visual loss in both eyes. Non-neovascular AMD is usually not treated; instead, patients are followed for the possible development of neovascular AMD. In addition, people with advanced AMD or vision loss due to AMD in one eye should consider taking supplemental antioxidants and zinc.

• People with the dry form of macular degeneration should be monitored for the onset of wet macular degeneration.

• Self-monitor vision by testing each eye individually for distorted vision or blank central spots. See a doctor immediately if new symptoms emerge.

• If detected early enough, wet macular degeneration may be treated with laser surgery (photocoagulation) or photodynamic therapy. These treatments aim to destroy the new leaking blood vessels and minimize growth and further vision loss. Such surgery should be performed only by an ophthalmologist with special training and experience in the procedure.

• New treatments being tested include new lasers, surgery to remove or move abnormal vessels, and new drugs, such as pegaptanib (Macugen) that may control new blood vessel growth.

• Careful follow-up is essential for all patients with age-related macular degeneration.

• Low-vision optical aids may be useful, including: high-power reading glasses; a small telescope mounted on one lens of your eyeglasses; a pocket telescope for reading street signs; and a closed-circuit television hookup that can magnify a written page as much as 60 times and display the image on a television screen.
Some studies indicate that people can take steps to prevent age-related macular degeneration or slow its progression. Steps to prevent or slow age-related macular degeneration include dietary supplements, diet, and, possibly, reduced exposure to sunlight.

The effect of dietary supplements on the risk and progression of age-related macular degeneration was investigated in the Age-Related Eye Disease Study (AREDS), which included more than 3,500 people (age 55 to 80). For an average of six years, participants took dietary supplements (containing antioxidants, zinc, or antioxidants plus zinc) or a placebo. None of the dietary supplements reduced the risk of developing age-related macular degeneration. But in those with intermediate or advanced age-related macular degeneration, the supplement containing antioxidants plus zinc reduced the risk of more advanced age-related macular degeneration by 25%.

The antioxidant plus zinc supplement used in the study contained 500 mg of vitamin C, 400 IU of vitamin E, 15 mg of beta-carotene, 80 mg of zinc oxide, and 2 mg of cupric oxide. It is sold under the brand name Ocu-vite PreserVision and is available without a prescription. (Smokers and people who have recently quit smoking should not use this supplement, because the beta-carotene in it has been found to increase the risk of lung cancer in smokers.) Other studies have suggested that eating fruits and vegetables high in carotenoids, especially those high in beta-carotene (carrots, spinach, and cantaloupes, for example), might help prevent age-related macular degeneration. In addition, avoiding excessive exposure to sunlight has been found to be protective in some studies.

In the Beaver Dam Eye Study, people who spent at least five hours a day in the summer engaged in leisure activities outdoors in their teens and 30s had twice the rate of age-related macular degeneration as those who spent fewer than two hours outside each day. In addition, people who wore hats and sunglasses tended to have a lower rate of age-related macular degeneration.
Rely on Expert Health Advice From Johns Hopkins

Vision White Paper
Written by Dr. Susan B. Bressler, professor of ophthalmology at the acclaimed Wilmer Eye Institute, and a team of top Johns Hopkins doctors, this comprehensive report is essential reading for anyone affected by a vision disorder, including low vision, cataracts, glaucoma, age-related macular degeneration, and diabetic retinopathy. Includes illustrations, an up-to-date chart of glaucoma drugs, and a glossary. 88 pages.

Diabetes White Paper
The Diabetes White Paper teaches you how to manage your Type 1 and Type 2 diabetes and avoid complications, such as nerve damage, heart disease, and retinopathy. This comprehensive report reviews the latest tools for monitoring your blood glucose and the newest medications for controlling it. 96 pages.

The Johns Hopkins Memory Bulletin
Edited by Dr. Peter V. Rabins, Professor of Psychiatry at the Johns Hopkins University School of Medicine and co-author of the best-selling guide for caregivers, The 36-Hour Day, The Johns Hopkins Memory Bulletin brings timely, in-depth information for anyone facing Alzheimer’s disease, dementia, or another memory problem. In each quarterly issue, you’ll read about the latest scientific breakthroughs, research findings from the world’s foremost medical journals and conferences, medications, caregiver support and relief, plus breakthrough medical discoveries for safeguarding your brain against aging and memory loss. Subscribe today at the special web-only discount and get 4 FREE special reports to download instantly.

The Johns Hopkins Medical Letter: Health After 50
Since 1988 this acclaimed monthly newsletter has delivered cutting-edge information on treating the major medical conditions affecting those over 50. Each eight-page issue delivers important news and research on women’s health, men’s health, nutrition, weight control, arthritis, COPD, colon cancer, dementia and much more. Friendly, easy-to-read, and written in plain English (without any advertising), Health After 50 speaks directly to your personal health concerns.

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