

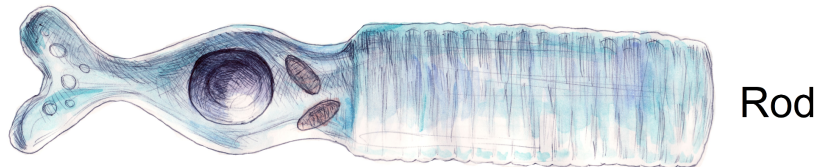
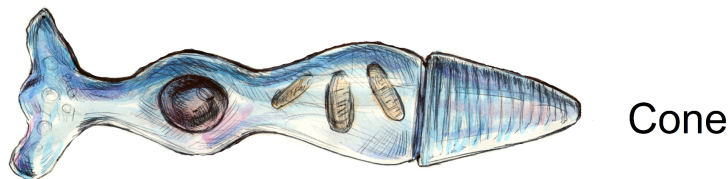


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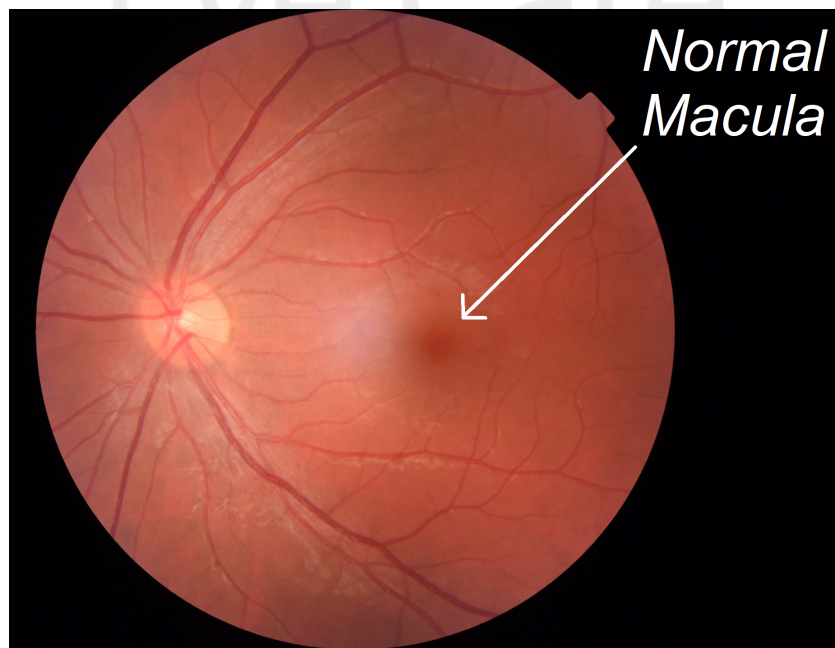
Age-Related Macular Degeneration

Overview

Age-Related Macular Degeneration (ARMD) is an eye disorder where there is a physical and functional deterioration of the photoreceptors (cones and rods) in the macula that is usually associated with age.



The macula is a portion of the eye that provides us with fine and detailed vision. It is heavily concentrated with cones. When we look directly at something our macula fixates on it and centers our vision over it. It is more darkly pigmented than most of the rest of the retina.

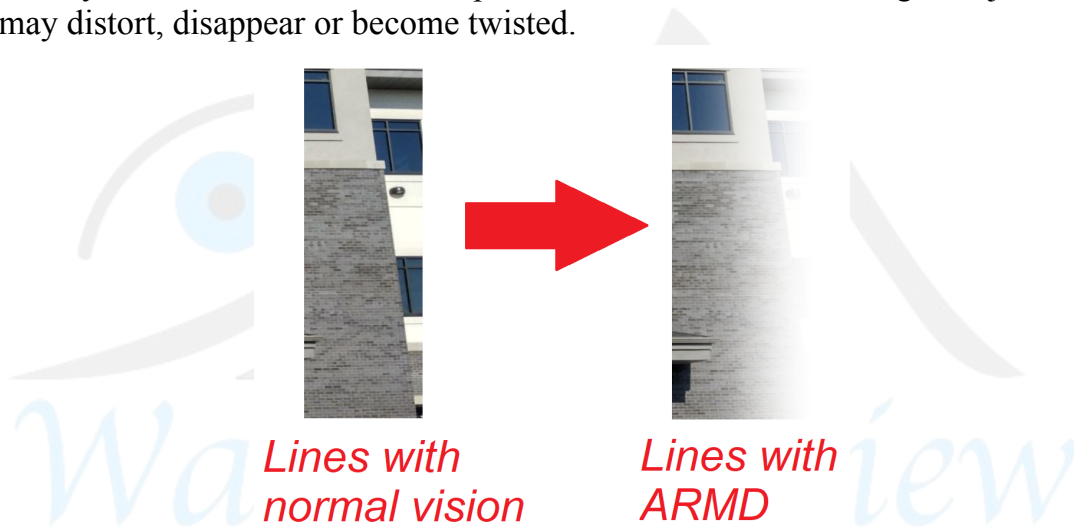


When the macula deteriorates because of macular degeneration there is a loss of central vision. In Americans over the age of 65, ARMD is the leading cause of vision loss. As a larger portion of the population gets older it is expected to become more and more prevalent.

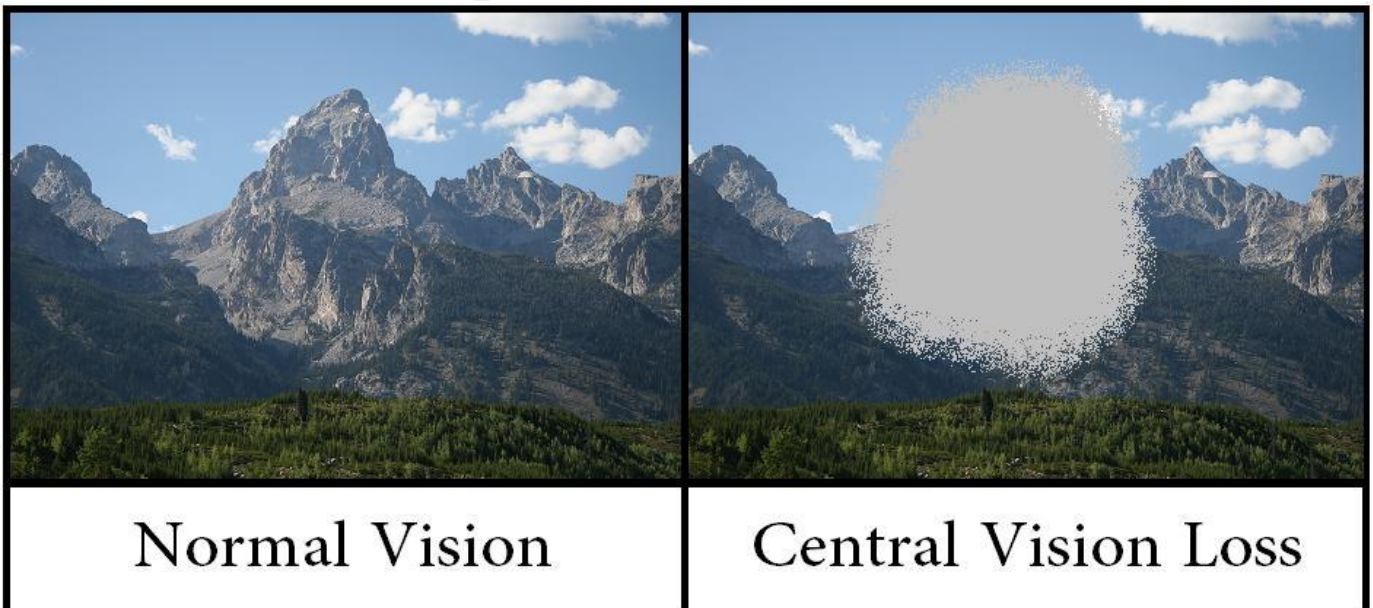
Macular degeneration takes on “dry” and “wet” forms. The “dry” form of macular degeneration happens because of non-vascular changes in the retina. The “wet” form is caused because of neo-vascular (abnormal blood vessel growth) changes in the macula. About 85% to 90% of ARMD is the “dry” form. The “dry” form has no treatment, but studies have shown that a specific set of vitamins slows its progression. The “wet” form is treated with anti-VEGF eye injections that stops the bleeding in the eye and without prompt treatment there can be devastating vision loss.

Signs and Symptoms

The most common signs and symptoms of ARMD are blurred and distorted central vision. Letters on a visual acuity chart become harder or impossible to read. When looking at objects with straight lines they may distort, disappear or become twisted.

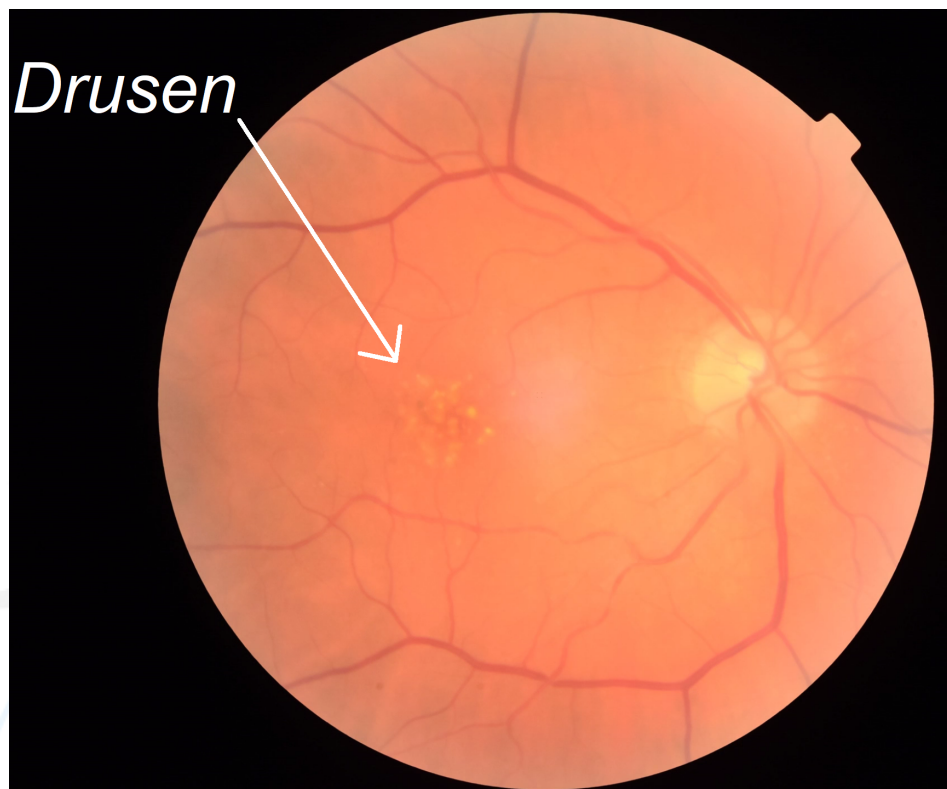


In advanced cases blindness results from loss of central vision, which severely limits an individual’s ability to drive, recognize faces and read.



Causes

The deterioration of the macula in “dry” ARMD is caused by the destruction of cells that support photoreceptors called retinal pigment epithelial cells. As drusen (a metabolic by-product photoreceptors not removed by the retina) builds-up in the macula it causes cell death to the supporting cells and deterioration of the photoreceptors in the macula resulting in loss of vision. “Dry” macular degeneration progresses slowly and in advanced cases leads to a large area of “geographic atrophy.”



In “wet” ARMD abnormal blood vessels develop from deteriorated parts of the macula. These blood vessels are weak and bleed very easily. When they burst or bleed, vision loss is sudden and dramatic.

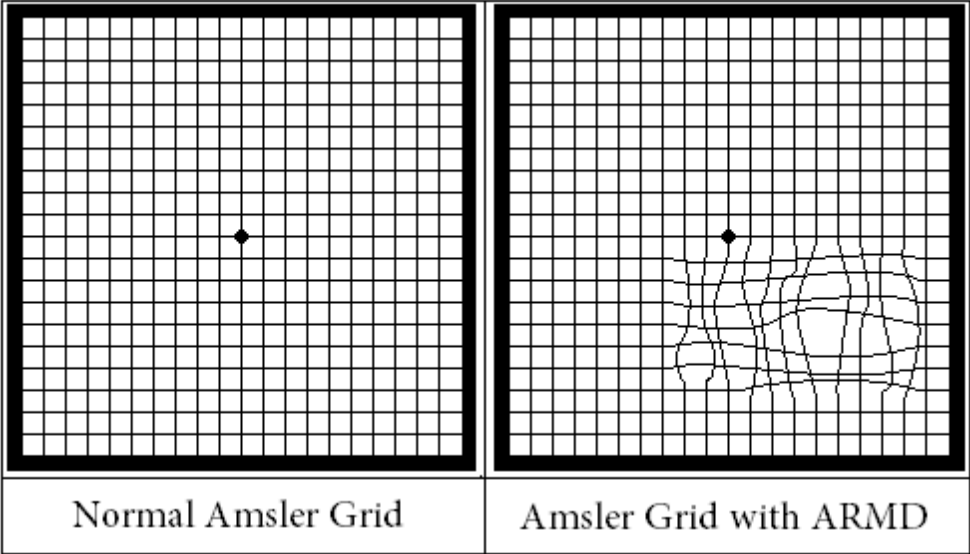
Risk factors for ARMD include smoking, family history, aging, obesity, high blood pressure, and lighter eye colors. It is also more common in Caucasians and women. Some research is also showing high levels of sun exposure and dietary fat may increase risk.

Testing & Evaluation

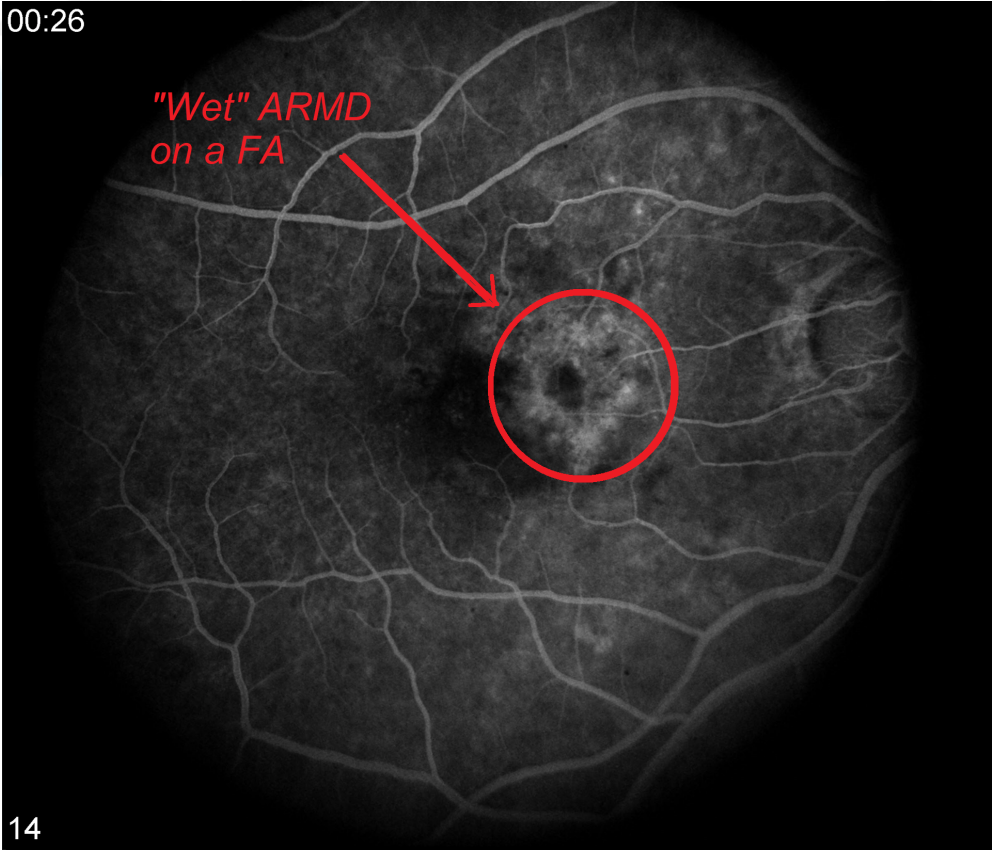
The most important evaluation is a dilated eye exam done at least every year by an eye professional. The eye exam will test corrected visual acuity to check the function of the macula and have the doctor look directly inside the eye at the macula for any signs of disease.

Subjective testing for macular degeneration includes the use of an Amsler Grid. It is a grid with a central dot used for fixation. A patient will fixate on the dot while covering up their other eye and then look for distortions and/or holes in the lines on the grid. In a normal eye

all of the lines are straight and complete. An eye with ARMD may notice distortions and/or holes in the lines.

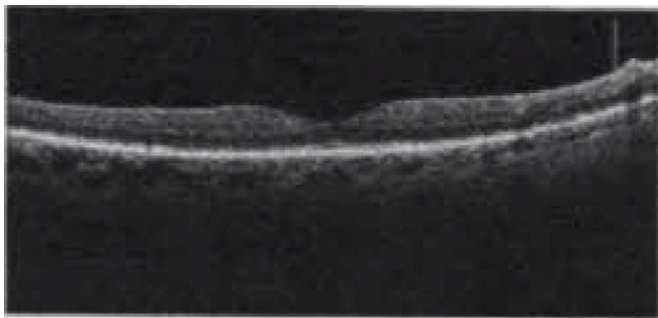


With “wet” macular degeneration A fluorescein angiography (FA) is often used for detection and direction of treatment. Fluorescein angiography involves injecting an inert dye into the bloodstream and then taking photographs of the fluorescing dye as it enters and drains from the eye. The dye will show areas that have “leaky” blood vessels.



Newer technology using optical coherence tomography (OCT) has improved testing and treatment. OCT uses scanning laser light to map and measure changes in the macular tissue. It has also

reduced the use of fluorescein angiography because of the possible side effects of injecting dye into the circulatory system.



*Normal
OCT of the
Macula*

The Foresee PHP® (Preferential Hyperacuity Perimeter) is another new method of testing.

Management

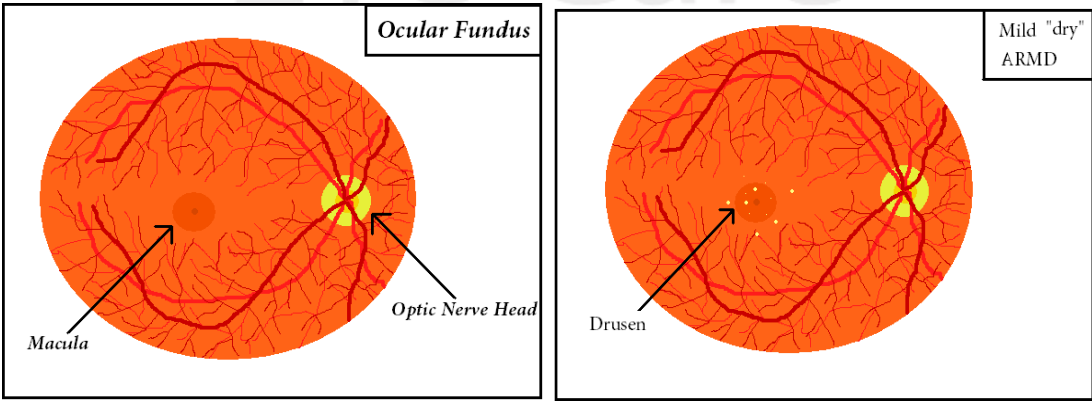
The “dry” form of macular degeneration has no effective treatment. However, studies have been done that show a specific set of vitamins can slow the progression. The most recent study is called AREDS 2 (Age Related Eye Disease Study). The vitamins used include Vitamin C, Vitamin E, Copper, Zinc, Lutein and Zeaxanthin.

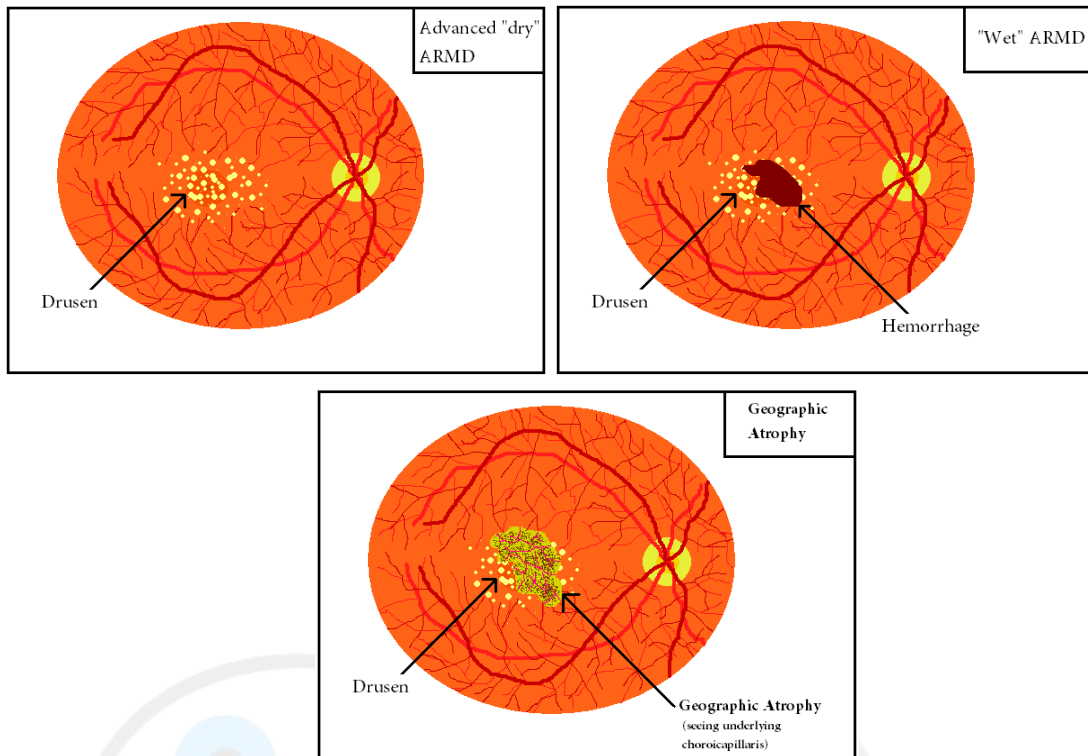
(<https://www.nei.nih.gov/research/clinical-trials/age-related-eye-disease-studies-aredsareds2>).

Older versions contain Beta-Carotene which increases your risk for lung cancer with a history of smoking. Some commercially prepared versions of these vitamins include Preservision, Ocuvite & I-Caps. They can be found over-the-counter in the pharmacy area of a store.

“Wet” ARMD has effective treatments, but it has to be done early to avoid a devastating loss of vision. Treatments are focused on destroying the growth of abnormal blood vessels associated with the “wet” form before they bleed out or hemorrhage. Medications used to treat neo-vascularization include Lucentis, Avastin, Macugen and Visudyne in Photodynamic Therapy.

ARMD Stages of Progression





Websites

All About Vision: <http://www.allaboutvision.com/conditions/amd.htm>

American Macular Degeneration Foundation: <http://www.macular.org/>

American Optometric Association:

<https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/macular-degeneration?sso=y>

National Eye Institute:

<https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/age-related-macular-degeneration>