

What We Know

- › In developed countries, age-related macular degeneration (AMD) is the leading cause of irreversible legal blindness in persons who are 50 years of age and older ^(1,2,4,5,6,11)
 - AMD is a chronic eye disease that is characterized by deterioration of the macula, which is the layer of tissue inside the back wall of the retina. AMD causes the loss of central vision, which is necessary for reading, driving, recognizing faces, and performing detailed tasks ^(3,6,8)
 - Nearly 7% of individuals over 40 years of age have signs of AMD and the prevalence of AMD is expected to reach 5.4 million persons by 2050⁽⁵⁾
 - Differential diagnosis for AMD includes diabetic retinopathy, hypertension, histoplasmosis, and several inherited macular dystrophies that affect the retina and produce macular changes that mimic AMD (e.g., juvenile macular dystrophy, Best disease, North Carolina macular dystrophy)⁽⁵⁾
- › The two forms of AMD are dry (also called nonexudative, atrophic, and geographic) and wet (also called exudative and neovascular). Both forms of AMD are progressive, usually bilateral, and can result in the loss of central vision and legal blindness, however, the wet form of AMD is more aggressive, and the dry form of AMD can convert to the wet form ^(4,5,6)
 - The dry form of AMD accounts for about 90% of cases and is characterized by gradual and painless deterioration of the macula and the presence of drusen deposits (i.e., mucoproteins and mucopolysaccharides that cause progressive calcification) that eventually multiply, enlarge, and impair retinal function. Initially, the center of the visual field is hazy, then begins to blur, and eventually becomes a central blind spot^(4,5,6)
 - The wet form of AMD, which comprises 10% of cases, is more unpredictable and progresses more rapidly than the dry form to permanent vision damage and loss. Visual distortions are present in addition to decreased central vision due to the accumulation of blood and fluid under the macula that result from choroidal neovascularization (CNV; i.e., abnormal growth of blood vessels)^(4,8)
 - For more information about AMD types, signs and symptoms, and treatment, see *Quick Lesson About ... Macular Degeneration, Age-Related*
- › Early detection of AMD is important to allow for an attempt to prevent the advancement of vision loss^(1,5,14)
 - Although effective treatment is not currently available for the dry form of AMD, patients with the dry form can benefit from low vision aids, smoking cessation, and antioxidant (e.g., vitamins C and E), mineral (e.g., zinc, copper) and carotenoid (e.g., lutein and zeaxanthin) supplementation to slow the progression of the disease^(4,6)
 - The wet form of AMD can be treated with therapies that block vascular endothelial growth factors (e.g., ranibizumab; bevacizumab, which is commonly used off-label) thereby reversing CNV; other treatment options for wet AMD include photodynamic therapy and laser photocoagulation surgery^(4,5,8)
 - Earlier diagnosis of either type of AMD allows for the opportunity to provide:
 - Serial eye examinations that are scheduled at regular intervals⁽¹⁵⁾

ICD-9
362.50

Authors

Carita Caple, RN, BSN, MSHS
Cinahl Information Systems, Glendale, CA

Tanja Schub, BS
Cinahl Information Systems, Glendale, CA

Reviewers

Darlene Strayer, RN, MBA
Cinahl Information Systems, Glendale, CA

Amy Hurst, RN, MSN
Cinahl Information Systems, Glendale, CA

Nursing Practice Council
Glendale Adventist Medical Center,
Glendale, CA

Editor

Diane Hanson, MM, BSN, RN, FNAP

August 20, 2021

- Referral to a clinician who specializes in AMD for comprehensive evaluation and education regarding the use of tools for daily self-testing for central vision changes (e.g., an Amslergrid)⁽²⁾
- Visual rehabilitation and use of inexpensive, low-vision aids to help maintain independence with ADLs⁽¹⁰⁾
- To determine whether fundus autofluorescence (FAF) or spectral domain optical coherence tomography (SD-OCT) was more sensitive in AMD assessment and diagnosis, researchers conducted a longitudinal study. Twenty-two patients diagnosed with intermediate AMD were included. While FAF was more sensitive under certain circumstances, the investigators recommended using both methods⁽⁹⁾
- Researchers compared OCT and color fundus photography by examining images of eyes of over 8,000 subjects over 55 years of age undergoing AMD screening. OCT was more effective in detecting AMD eyes.⁽⁷⁾
- Information on strategies for prevention and reducing AMD risk (e.g., vitamin and mineral supplementation, use of protective eyewear in direct sunlight).^(4,7,16) (For more information, see *Evidence-Based Care Sheet: Macular Degeneration, Age-Related: Risks and Prevention*)
- › In the general population, schedules for routine eye and vision screening for AMD are determined by age alone because early-stage AMD is typically asymptomatic⁽¹⁴⁾
 - The American Academy of Ophthalmology (AAO) recommends that all asymptomatic individuals receive a baseline eye disease screening examination at 40 years of age, followed by serial examination at an interval that is determined by the results of the initial examination.⁽¹⁴⁾
- › The AAO recommends that patients with signs and symptoms that are suggestive of AMD undergo more extensive testing, including⁽¹⁵⁾
 - a complete vision history that incorporates discussion about patient symptoms, medication and nutritional supplement use, ocular history, medical history, and social history and discussion about family history
 - Risk of developing AMD is increased 3-fold in first-degree relatives of affected patients⁽¹²⁾
 - Although researchers have identified several genes that affect AMD risk, the AAO does not recommend the routine use of genetic testing in screening for AMD^(5,12)
 - Other risk factors for AMD include increasing age, cigarette smoking, heavy alcohol use, obesity, heavy sunlight exposure, hyperlipidemia, White race, female sex, atherosclerosis, and low dietary intake of lutein, omega-3 fatty acids, zinc, and vitamins A, C, and E^(1,11,12)
 - comprehensive ophthalmologic examination, including stereoscopic biomicroscopic examination of the macula. Binocular slit-lamp biomicroscopy of the ocular fundus can be necessary to identify subtle clinical signs of wet AMD
 - Additional tests that can be performed include fluorescein angiography, ocular coherence tomography, and/or a preferential hyperacuity perimeter test to differentiate wet and dry AMD⁽¹⁵⁾
- › In addition to AMD screening in primary care, ophthalmologist offices, and home monitoring with the use of an Amsler grid, new at-home screening tests for patients to monitor for development of CNV, which indicates progression of dry AMD to wet AMD, are in clinical testing⁽¹³⁾
 - In a study of 129 patients with intermediate AMD, researchers found that 70% demonstrated an ability to perform in-home use of a monitoring device for detection of CNV; younger patients were more likely to qualify for use of the home monitoring device, but baseline visual acuity was not associated with successful qualification⁽¹³⁾

What We Can Do

- › Learn about screening and early detection of AMD to accurately assess patients' personal characteristics and health education needs; share this information with colleagues
- › Ask patients who are 40 years of age and older about vision changes and symptoms as a routine part of every healthcare visit; educate them about^(1,2,5)
 - risk factors for AMD (e.g., history of smoking, heavy drinking, atherosclerosis, and family history of AMD)
 - the necessity of routine visual and eye examinations
 - the importance of early detection of AMD and prompt referral to an eye specialist to obtain treatment and slow the progression of vision loss
- › Educate patients who have been diagnosed with AMD about the importance of^(1,2,5,16)
 - performing self-examination of both eyes using tools such as the Amsler grid
 - obtaining a comprehensive clinician screening and follow-up examinations at regular intervals

- becoming educated about approved prevention and treatment options, including receiving nutritional education about optimal diet, and vitamin and mineral supplementation
 - using low-vision aids (e.g., magnifiers, telescopes, closed-circuit television, writing aids, large keypads, high-contrast items, auditory substitutes, and tactile markers) to improve functional status and quality of life
 - Request a referral to a social worker for identification of local resources for low-vision aids
 - becoming educated about the psychosocial implications of AMD that affect the ability to adjust to having progressively impaired vision. (For details, see *Evidence-Based Care Sheet: Macular Degeneration: Psychosocial Aspects*)
- › Collaborate with the hospital's continuing medical education department to provide education on screening for early detection of AMD to clinicians of all specialties

Coding Matrix

References are rated using the following codes, listed in order of strength:

M Published meta-analysis	RV Published review of the literature	PP Policies, procedures, protocols
SR Published systematic or integrative literature review	RU Published research utilization report	X Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	QI Published quality improvement report	GI General or background information/texts/reports
R Published research (not randomized controlled trial)	L Legislation	U Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	PGR Published government report	CP Conference proceedings, abstracts, presentation
G Published guidelines	PFR Published funded report	

References

1. Allinson, R.W., & Allinson, F. (2021). Macular degeneration, age-related. *The 5-Minute Clinical Consult 2021* (29th ed.). Philadelphia, PA: Wolters Kluwer. **(GI)**
2. Boyd, K. (2021). What is Macular Degeneration. *American Academy of Ophthalmology Eye Smart*. Retrieved August 4, 2021, from <https://www.aao.org/eye-health/diseases/amd-macular-degeneration> **(GI)**
3. Chakravarthy, U. (2020). Current perspective on age-related macular degeneration. *JAMA*, 324(8), 794-795. **(GI)**
4. Duncan, J.L., Parikh, N.B., & Seitzman, G.D. (2021). Disorders of the eyes & lids. M. A. Papadakis & S. J. McPhee (Eds.), *2021 current medical diagnosis & treatment* (60th ed.). New York, NY: McGraw-Hill Medical. **(GI)**
5. Janigian, R. H. (2021). Macular degeneration. In F. F. Ferri (Ed.), *2021 Ferri's clinical advisor: 5 books in 1* (p. 783). Philadelphia, PA: Elsevier. **(GI)**
6. Maturi, R., & Franklin, A.J. (2021). Nonexudative (dry) age-related macular degeneration (AMD). Retrieved from <https://emedicine.medscape.com/article/1223154-overview> **(GI)**
7. Midena, E., Frizziero, L., Torresin, T., Bosedo Todor, P., Miglionico, G., & Pilotto, E. (2020). Optical coherence tomography and color fundus photography in the screening of age-related macular degeneration: A comparative population-based study. *PloS One*, 15(8), e0237352. **(R)**
8. Prall, R.F., & Ciulla, T.A. (2021). Exudative (wet) age-related macular degeneration (AMD). Retrieved August 10, 2021, from <https://emedicine.medscape.com/article/1226030-overview> **(G)**
9. Rodriguez, A., Biarnes, M., Coco=Martin, R.M., Sala-Ouigollers, A., & Monees, J. (2020, September 6). Early detection of incipient retinal pigment epithelium atrophy overlying drusen with fundus autofluorescence vs. spectral domain optical coherence tomography. *Journal of Ophthalmology*, 9457457. **(R)**
10. Riordan-Eva, P. (2018). Disorders of the eyes & lids. In M. A. Papadakis & S. J. McPhee (Eds.), *2018 Current medical diagnosis & treatment* (57th ed., pp. 191-192). New York, NY: McGraw-Hill Education. **(GI)**
11. Ruia, S. (2021). Macular Degeneration. Retrieved August 4, 2021, from <https://www.statpearls.com/ArticleLibrary/viewarticle/24630> **(GI)**
12. Sobrin, L., & Seddon, J. M. (2019). Genetics of age-related macular degeneration. *Medscape*. Retrieved August 4, 2021, from <http://emedicine.medscape.com/article/1940442-overview> **(GI)**
13. Thomas, M., Wolfson, Y., Zayit-Soudry, S. B., & Bressler, N. M. (2015). Qualifying to use a home monitoring device for detection of neovascular age-related macular degeneration. *JAMA Ophthalmology*, 133(12), 1425-1430. doi:10.1001/jamaophthalmol.2015.3684 **(R)**
14. Tubert, D. (2019). Get an eye disease screening at 40. *American Academy of Ophthalmology Eye Smart*. Retrieved August 4, 2021, from <https://www.aao.org/eye-health/tips-prevention/screening> **(GI)**
15. Tubert, D. (2021). Eye exam and vision testing basics. *American Academy of Ophthalmology Eye Smart*. Retrieved August 4, 2021, from <https://www.aao.org/eye-health/tips-prevention/eye-exams-101> **(GI)**
16. Walchuk, C., & Suk, M. (2020). Nutrition and the aging retina: A comprehensive review of the relationship between nutrients and their role in age-related macular degeneration and retina disease prevention. *Advances in Food & Nutrition Research*, 93, 293-332. **(RV)**