

References - Geographic Atrophy

1. Bird AC, Bressler NM, Bressler SB, et al. An International Classification and Grading System for Age-Related Maculopathy and Age-Related Macular Degeneration. The International ARM Epidemiology Study Group. *Surv Ophthalmol*. 1995;39:367-374.
2. Buch H, Vinding T, Nielsen NV, et al. 14-year incidence progression and visual morbidity of age-related maculopathy: The Copenhagen City Eye Study. *Ophthalmology*. 2005;112:787-798.
3. Ferris FL, Fine SL, Hyman L. Age-related macular degeneration and blindness due to neovascular maculopathy. *Arch Ophthalmol*. 1984;102:1640-1642.
4. Klein R, Klein BE, Linton KL. Prevalence of age-related maculopathy. The Beaver Dam Eye Study. *Ophthalmology*. 1992;99:933-943.
5. Rudnicka AR, Jarrar Z, Wormald R, et al. Age and gender variations in age-related macular degeneration prevalence in populations of European ancestry: a meta-analysis. *Ophthalmology*. 2012;119:571-580.
6. Holz FG, Strauss EC, Schmitz-Valckenberg S, et al. Geographic Atrophy Clinical Features and Potential Therapeutic Approaches. *Ophthalmology*. 2014;121:1079-1091.
7. Hanus J, Zhao F, Wang S. Current Therapeutic Development for Atrophic Age-related Macular Degeneration. *Br J Ophthalmol*. 2016;100(6):744.
8. Srinivas S, Chakravarthy U, et al. Clinical endpoints for the study of geographic atrophy secondary to age-related macular degeneration. *Retina*. 2016;36:1806-1822.
9. Age-Related Eye Disease Study Research Group. Risk factors for the incidence of Advanced Age-Related Macular Degeneration in Age-Related Eye disease Study: AREDS report nº 8. *Arch Ophthalmol*. 2008; 119:1417-1436.
10. Ferris FL III, Wilkinson CP, Bird A, et al. Clinical classification of age-related macular degeneration. *Ophthalmology*. 2013;120:844-851.
11. Gass JDM. Drusen and disciform macular detachment and degeneration. *Arch Ophthalmol*. 1973; 90:206-217.

12. Vingerling JR, Dielmans I, Hofman A, et al. The prevalence of age-related maculopathy in the Rotterdam Study. *Ophthalmology*. 1995;102:205-210.
13. Smith W, Assink J, Klein R, et al. Risk factors for age-related macular degeneration: Pooled findings from three continents. *Ophthalmology*. 2001;108:697-704.
14. Fraser-Bell S, Wu J, Klein R, et al. Smoking, Alcohol Intake, Estrogen Use, and Age-related Macular Degeneration in Latinos: The Los Angeles Latino Eye Study. *Am J Ophthalmol*. 2006;141:79-87.
15. Rudnicka AR, Kapetanakis VV, Jarrar Z, et al. Incidence of late-stage age-related macular degeneration in American whites: systematic review and meta-analysis. *Am J Ophthalmol*. 2015;160:85-93 e83.
16. Klein R, Klein BE, Knudtson MD, et al. Fifteen-year cumulative incidence of age-related macular degeneration: the Beaver Dam Eye Study. *Ophthalmology*. 2007;114:253-262.
17. Age-Related Eye Disease Study Research Group. Risk factors associated with age-related macular degeneration: A case-control study in the Age-Related Eye Disease Study: AREDS report nº3. *Ophthalmology*. 2000;107:2224-2232.
18. Friedman DS, Katz J, Bressler NM, et al. Racial differences in the prevalence of age-related macular degeneration: the Baltimore Eye Survey. *Ophthalmology*. 1999;106:1049-1055.
19. Klein R, Klein BE, Knudtson M, et al. Prevalence of Age-related Macular Degeneration in 4 Racial/Ethnic Groups in the Multi-ethnic Study of Atherosclerosis. *Ophthalmology*. 2006;113:373-380.
20. Klein R, Klein BE, Tomany SC. The Association of Cardiovascular Disease with the Long-term Incidence of Age-Related Maculopathy: The Beaver Dam Eye Study. *Ophthalmology*. 2002;110:1273-1280.
21. Postel EA, Agarwal A, Caldwell J, et al. Complement Factor H Increases Risk for Atrophic Age-Related Macular Degeneration. *Ophthalmology*. 2006;113:1504-1507.
22. Dominiek DG, Cornelia MD, Oostra BA, et al. Complement Component C3 and Risk of Age-Related Macular Degeneration. *Ophthalmology*. 2009;115:474-480.
23. Cameron DJ, Yang Z, et al. HTRA1 variant confer similar risk to Geographic Atrophy and Neovascular Age-Related Macular Degeneration. *Cell Cycle*. 2007;6(9):1122-

25. Majewski J, Schultz DW, Weleber RG, et al. Age-Related Macular Degeneration: a genome scan in extended families. *Am J Hum Genet.* 2003;73:540-550.
26. Abecasis GR, Yashar BM, Zhao Y, et al. Age-related macular degeneration: a high resolution genome scan for susceptibility loci in a population enriched for late-stage disease. *Am J Hum Genet.* 2004;74:482-494.
27. Seddon JM, Ajani UA, Mitchell BD. Familial aggregation of age-related maculopathy. *Am J Ophthalmol.* 1997;123:199-206.
28. Age-Related Eye Disease Study Research Group. The Age-Related Eye Disease Study Severity Scale for Age-Related Macular Degeneration: Age-Related Eye Disease Study (AREDS) report nº 17. *Arch Ophthalmol.* 2005;123:1484-1498.
29. Klein ML, Ferris FLIII, Armstrong J, et al. (AREDS Research Group). Retinal Precursors and the Development of Geographic Atrophy in Age-Related Macular Degeneration. *Ophthalmology.* 2008;115:1026-1031.
30. Pauleikhoff D, Spital G, Bird AC. A Fluorescein and Indocyanine Green Angiographic Study of Choriocapillaris in Age-related Macular Disease. *Arch Ophthalmol.* 1999;117:1353-1358.
31. Kashani AH. Stem Cell Therapy in Nonneovascular Age-Related Macular Degeneration. *Invest Ophthalmol Vis Sci.* 2016;57(5):ORSFm1-9.
32. Klein ML, Ferris FL 3rd, Armstrong J. Retinal precursors and the development of geographic atrophy in age-related macular degeneration. *Ophthalmology.* 2008;115(6):1026-31.
33. Age-Related Eye Disease Study Research Group. Natural History of Drusenoid Pigment Epithelial Detachment in Age-Related Macular Degeneration: AREDS report nº 28. *Ophthalmology.* 2010;117:489-499.
34. Casswell AG, Kohen D, Bird AC. Retinal pigment epithelial detachments in the elderly: classification and outcome. *Br J Ophthalmol.* 1985;69:397-403.
35. Finger RP, Wu Z, Luu CD, et al. Reticular pseudodrusen: a risk factor for geographic atrophy in fellow eyes of individuals with unilateral choroidal neovascularization. *Ophthalmology.* 2014;121:1252-1256.
36. Marsiglia M, Boddu S, Beareilly S, et al. Association between geographic atrophy progression and reticular pseudodrusen in eyes with dry age-related macular

degeneration. Invest Ophthalmology Vis Sci. 2013;54:7362-7369.

37. Kovach JL, Schwartz SG, Agarwal A, et al. The relationship between reticular pseudodrusen and severity of AMD. Ophthalmology. 2016;123:921-9236.
38. Lutty G, Grunwald J, Majji AB, et al. Changes in choriocapillaris and retinal pigment epithelium in age-related macular degeneration. Mol Vis. 1999;5:35.
39. McLeod DS, Taomoto M, Otsuji T, et al. Quantifying Changes in RPE and Choroidal Vasculature in Eyes with Age-Related Macular Degeneration. Invest Ophthalmol Vis Sci. 2002;43:1986-1993.
40. Sparrow JR, Boulton M. Lipofuscin and its role in retinal pathobiology. Exp Eye Res. 2005;80:595-606.
41. Curcio CA, Medeiros NE, Milican CL. Photoreceptor Loss in Age-Related Macular Degeneration. Invest Ophthalmol Vis Sci. 1996;37:1236-1249.
42. Kim SY, Sadda S, Humayun MS, et al. Morphometric Analysis of the Macula in Eyes With Geographic Atrophy due to Age-Related Macular Degeneration. Retina. 2002;22:464-470.
43. Holz FG, Schutt F, Kopitz J, et al. Inhibition of Lysosomal Degradative Functions in RPE Cells by a Retinoid Component of Lipofuscin. Invest Ophthalmol Vis Sci. 1999;40:737-743.
44. Beatty S, Koh H, Phil M, et al. The Role of Oxidative Stress in the Pathogenesis of Age-Related Macular Degeneration. Surv Ophthalmol. 2000;45:115-134.
45. Rózanowska M, Korytowski W, Rózanowski B, et al. Photoreactivity of Aged Human RPE Melanosomes: A Comparison with Lipofuscin. Invest Ophthalmol Vis Sci. 2002;43:2088-2096.
46. Anderson DH, Mullins RF, Hageman GS, et al. A Role for Local Inflammation in the Formation of Drusen in the Aging Eye. Am J Ophthalmol. 2002;134:411-431.
47. Coleman H R, Ferris III FL, Chew EY, et al. Age related macular degeneration. Lancet. 2008;372 (9652):1835-1845.
48. Bischoff P, Speiser P. The role of angiography in age-related macular degeneration. Klin Monatsbl Augenheilkd. 1997;210:296-8.

49. Shuman JS, Puliafito CA, Fujimoto JG, et al. Optical Coherence Tomography of Ocular Diseases. Second edition. Slack, 2004.
50. Beareilly S, Chau FY, Koreishi A, et al. Spectral Domain Coherence Tomography Imaging of Geographic Atrophy Margins. *Ophthalmology*. 2009;116:1762-1769.
51. Fleckenstein M, Issa PC, Holz FG, et al. High-Resolution Spectral Domain-OCT Imaging in Geographic Atrophy Associated with Age-Related Macular Degeneration. *Invest Ophthalmol Vis Sci*. 2008;49(9):4137-4144.
52. Karl G Csaky. What Should We Be Measuring as a Geographic Atrophy Endpoint? AAO Subspeciality Day Retina Sillabus.2015; p154-156.
53. Wu Z, Luu CD, Ayton LN, et al. Optical coherence tomography- defined changes preceding the development of drusen-associated atrophy in age-related macular degeneration. *Ophthalmology*. 2014;121:2415-2422.
54. Ouyang Y, Heussen FM, Hariri A, et al. Optical coherence tomography-based observation of the natural history of drusenoid lesion in eyes with dry age-related macular degeneration. *Ophthalmology*. 2013;120:2656-2665.
55. Delori FC, Dorey CK, Staurenghi G, et al. In Vivo Fluorescence of the Ocular Fundus Exhibits Retinal Pigment Epithelium Lipofuscin Characteristics. *Invest Ophthalmol Vis Sci*. 1995;36:718-729.
56. Sparrow JR, Fishkin N, Zhou J, et al. A2E, a Byoproduct of the Visual Cycle. *Vision Res*. 2003;43:2983-2990.
57. Frangieh GT, Green WR, Fine SL. A histopathological Study of Best's Macular Dystrophy. *Arch Ophthalmol*. 1982;100:1115-1121.
58. Sparrow JR, Boulton M. Lipofuscin and its role in retinal pathobiology. *Exp Eye Res*. 2005;80:595-606.
59. Von Ruckmann A, Fitzke FW, Bird AC. Fundus Autofluorescence in Age-Related Macular Disease Imaged with Laser scanning Ophthalmoscope. *Invest Ophthalmol Vis Sci*. 1997;38:478-86.
60. Holz FG, Bellman C, Staudt S, et al. Fundus Autofluorescence and Development of Geographic Atrophy in Age-Related Macular Degeneration. *Invest Ophthalmol Vis Sci*. 2001;42:1051-1056.
61. Schmitz-Valkenberg S, Bültmann S, Dreyhaupy J, et al. Fundus autofluorescence and fundus perimetry in the junctional zone of geographic atrophy in patients with age-related macular degeneration. *Invest Ophthalmol Vis Sci*. 2004;45:4470-4476.

62. Schmitz-Valckenberg S, Bindewald-Wittich A, Dolar-Szczasny J, et al. Fundus Autofluorescence and Fundus Perimetry in the Junctional Zone of Geographic Atrophy in Patients with Age-Related Macular Degeneration. *Invest Ophthalmol Vis Sci.* 2006;47:2648-2654.
63. Bindewald A, Schmitz-Valckenberg S, Jorzik JJ et al. Classification of abnormal fundus autofluorescence patterns in the junctional zone of geographic atrophy in patients with age related macular degeneration. *Br J Ophthalmol.* 2005;89(7):874-8.
64. Holz FG, Bindewald-Wittich A, Fleckenstein M et al. Progression of geographic atrophy and impact of fundus autofluorescence patterns in age-related macular degeneration. *Am J Ophthalmol.* 2007;143(3):463-72.
65. Suness JS, Gonzalez-Baron J, Bressler NM, et al. The Development of Choroidal Neovascularization in Eyes with Geographic Atrophy Form of Age-Related Macular Degeneration. *Ophthalmology.* 1999;106:910-919.
66. Suness JS, Margalit E, Bressler NM, et al. The Long-term Natural History of Geographic Atrophy from Age-Related Macular Degeneration: Enlargement of Atrophy and Implications for Interventional Clinical Trials. *Ophthalmology.* 2007;114:271-277.
67. Schatz H, McDonald HR. Atrophic Macular Degeneration. Rate of Spread of Geographic Atrophy and Visual Loss. *Ophthalmology.* 1989;96:1541-1551.
68. Bellmann C, Jorzik J, Spital G, et al. Symmetry of bilateral lesions in geographic atrophy in patients with age-related macular degeneration. *Ophthalmology.* 2002;120:579-584.
69. Klein R, Meuer SM, Knudtson MD, Klein BE. The epidemiology of progression of pure geographic atrophy: the Beaver Dam Eye Study. *Am J Ophthalmol.* 2008;146:692-699.
70. Suness JS, Rubin GS, Broman A, et al. Low luminance Visual Dysfunction as a Predictor of Subsequent Visual Loss From Geographic Atrophy in Age-Related Macular Degeneration. *Ophthalmology.* 2008;115:1480-1488.
71. Maguire P, Vine AK. Geographic Atrophy of Retinal Pigment Epithelium. *Am J Ophthalmol.* 1986;102:621-625.
72. Suness JS, Gonzalez-Baron J, Applegate CA, et al. Enlargement of Atrophy and Visual Acuity Loss in the Geographic Atrophy Form of Age-Related Macular Degeneration. *Ophthalmology.* 1999;106:1768-1779.

73. Suness JS, Applegate CA, Bressler NM, et al. Visual Function Abnormalities and Prognosis in Eyes with Age-Related Geographic Atrophy of the Macula and Good Visual Acuity. *Ophthalmology*. 1997;104(10):1677-1691.
74. Davis MD, Gangnon RE, Lee LY, et al. The Age-Related Eye Disease Study severity scale for age-related macular degeneration: AREDS Report No. 17. *Arch Ophthalmol*. 2005;123:1484-1498.
75. Schatz H, McDonald HR. Atrophic macular degeneration. Rate of spread of geographic atrophy and visual loss. *Ophthalmology*. 1989;96:1541-1551.
76. Macular Photocoagulation Study Group. Risk factors for choroidal neovascularization in the second eye of patients with juxtafoveal or subfoveal choroidal neovascularization secondary to age-related macular degeneration. *Arch Ophthalmol*. 1997;115:741-747.
77. Coleman H, Chew E. Nutritional Supplementation in Age-Related Macular Degeneration. *Curr Opin Ophthalmol*. 2007;18:220-223.
78. Age-Related Eye Disease Study Research Group. Risk Factors for the Incidence of Advanced Age-Related Macular Degeneration in Age-Related Eye Disease Study: AREDS report nº 23. *Arch Ophthalmol*. 2008;126:1274-1279.
79. Chiu CJ, Milton RC, Klein R et al. Dietary Compound Score and Risk of Age-Related Macular Degeneration in the Age-Related Eye Disease Study. *Ophthalmology*. 2008;116: 939-946.
80. Age-Related Eye Disease Study 2 Research Group. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: the Age-Related Eye Disease Study 2 (AREDS2) randomized clinical trial. *JAMA*. 2013;309:2005-15.
81. Khan JC, Thurlby DA, Shahid H, et al. Smoking and age related macular degeneration: the number of pack years of cigarette smoking is a major determinant of risk for both geographic atrophy and choroidal neovascularisation. *Br J Ophthalmol*. 2006;90:75-80.
82. Age-Related Eye Disease Study Research Group. Risk factors for the incidence of Advanced Age-Related Macular Degeneration in Age-Related Eye Disease Study: AREDS report nº 19. *Ophthalmology*. 2005;112:533-539.
83. Age-Related Macular Degeneration PPP - Updated 2015. AAO Retina/Vitreous PPP Panel, Hoskins Center for Quality Eye Care.

84. Jack LS, Sadiq MA, Do DV, Nguyen QD. Emixustat and Lampalizumab: Potential Therapeutic Options for Geographic Atrophy. *Dev Ophthalmol*. 2016;55:302-9.
85. Mata NL, Lichter JB, Vogel R, et al. Investigation of oral fenretinide for treatment of geographic atrophy in age-related macular degeneration. *Retina*. 2013;33:498-507.
86. <http://www.businesswire.com/news/home/20160525006550/en/Acucela-Announces-Top-Line-Results-Phase-2b3-Clinical>
87. Elisa Buschini, Antonio M Fea, Carlo A Lavia, et al. Recent developments in the management of dry age-related macular degeneration. *Clin Ophthalmol*. 2015;9:563-574.
88. Barbosa DT, Mendes TS, Cíntron-Colon HR, et al. Age-related macular degeneration and protective effect of HMG Co-A reductase inhibitors (statins): results from the National Health and Nutrition Examination Survey 2005-2008. *Eye (Lond)*. 2014;28(4):472-80.
89. Gehlbach P, Li T, Hatef E. Statins for age-related macular degeneration. *Cochrane Database Syst Rev*. 2012;(3):CD006927.
90. Parsons CG, Ruitenberg M, Freitag CE, et al. MRZ-99030 - A novel modulator of A β aggregation: I - Mechanism of action (MoA) underlying the potential neuroprotective treatment of Alzheimer's disease, glaucoma and age-related macular degeneration (AMD). *Neuropharmacology*. 2015;92:158-69.
91. <https://www.aao.org/interview/brimonidine-geographic-atrophy>
92. Zhang K, Hopkins JJ, Heier JS, et al. Ciliary neurotrophic factor delivered by encapsulated cell intraocular implants for treatment of geographic atrophy in age-related macular degeneration. *Proc Natl Acad Sci U S A*. 2011;108:6241-5.
93. AREDS Research Group. Change in area of geographic atrophy in the Age-Related Eye Disease Study: AREDS report number 26. *Arch Ophthalmol*. 2009;127:1168-74.
94. Sangiovanni JP, Agron E, Meleth AD, et al. {omega}-3 Long-chain polyunsaturated fatty acid intake and 12-y incidence of neovascular age-related macular degeneration and central geographic atrophy: AREDS report 30, a prospective cohort study from the Age-Related Eye Disease Study. *Am J Clin Nutr*. 2009;90(6):1601-7.
95. Konstantin Petrukin. New Therapeutic Targets in Atrophic Age-Related Macular Degeneration. *Expert Opin Ther Targets*. 2007;11:625-639.

96. Tanito M, Li F, Elliot MH, et al. Protective effect of TEMPOL derivatives against Light-Induced Retinal Damage in Rats. *Invest Ophthalmol Vis Sci*. 2007;48:1900-1905.
97. Wong WT, Kam W, Cunningham D, et al. Treatment of geographic atrophy by the topical administration of OT-551: results of a phase II clinical trial. *Invest Ophthalmol Vis Sci*. 2010;51(12):6131-6139.
98. Schwartz SD, Regillo CD, Lam BL, et al. Human embryonic stem cell-derived retinal pigment epithelium in patients with age-related macular degeneration and Stargardt's macular dystrophy: follow-up of two open-label phase 1/2 studies. *Lancet*. 2015;385(9967):509-516.

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