VISION ACADEMY
people | research | education

VISION ACADEMY VIEWPOINT

The Vision Academy is a partnership between Bayer and ophthalmic specialists, established with the aim of addressing key clinical challenges in the field of retinal diseases

Simultaneous Geographic Atrophy and Choroidal Neovascularization/ Macular Neovascularization in Age-Related Macular Degeneration

Background

Age-related macular degeneration (AMD) is a leading cause of blindness in the elderly, with macular neovascularization (MNV) and geographic atrophy (GA) often occurring in the latter stages.[1] MNV is defined as the formation of pathological neovascularization in the macula, while GA is defined as macular atrophy in the absence of MNV.[2] GA and MNV have previously been considered distinct conditions due to their differing clinical characteristics. However, recent evidence suggests the coexistence of GA and choroidal neovascularization (CNV)/MNV in some patients.[3-5] Clinical studies have typically focused on either GA or CNV/MNV and, as such, treatment options for simultaneous GA and CNV/MNV are limited.

A review of the literature and available evidence[6] was conducted to:

- Characterize the incidence, risk factors, and clinical characteristics associated with simultaneous GA and CNV/MNV
- Provide guidance on the diagnosis and management of simultaneous GA and CNV/MNV in clinical practice

Endorsed by the Vision Academy in April 2025.

Viewpoint

Available epidemiological data report the incidence of CNV/MNV in GA as 7.4% per patient-year (mean follow-up period: 1.4 years) or 13.8% over a mean follow-up period of 4.1 years.[3,4] The incidence of GA subsequent to CNV/MNV is reported as 24.4–37% at 24 months.[7-10] Recent studies using optical coherence tomography angiography (OCT-A) revealed the presence of subclinical CNV/MNV in 11–16% of eyes with GA.[5] When evaluating simultaneous GA and CNV/MNV, it is important to consider that population differences, including race and geographic location, may influence the incidence of GA.

A review of the available evidence confirmed that GA and CNV/MNV share the genetic risk factors *HTRA1*, complement factor H, complement factors 3 and 2, and *ARMS2*, and the clinical characteristics of large drusen, cuticular drusen, intraretinal hyperreflective foci, and subretinal drusenoid deposits.[11,12] These commonalities suggest that simultaneous GA and CNV/MNV represent a continuum of late-stage AMD.

Upon evaluating the recent evidence to inform the diagnosis and management of simultaneous GA and CNV/MNV, a set of recommendations was developed. It should be noted that these recommendations represent the ideal scenario, and full implementation may not be possible in all clinics. These recommendations were developed by a Vision Academy workstream and subsequently reviewed, commented upon, and endorsed by a majority of the Vision Academy membership before publication.

Vision Academy Viewpoints are intended to raise awareness of a clinical challenge within ophthalmology and provide an expert opinion to engage in further discussion.
The Vision Academy is a group of over 80 international experts who, through their collective expertise, provide consensus guidance for managing clinically challenging situations, especially in areas of controversy or with insufficient conclusive evidence.
The Vision Academy is funded and facilitated by Bayer. This document is based on the Vision Academy publication: Kataoka K *et al. Graefes Arch Clin Exp Ophthalmol* 2025; Epub ahead of print. doi: 10.1007/s00417-024-06721-5 developed by Keiko Kataoka, Richard Gale, Xiaoxin Li, Figen Şermet, Cynthia X. Qian, Chui Ming Gemmy Cheung, Miltiadis K. Tsilimbaris, and Igor Kozak. Medical writing and editorial support was provided by Caudex, an IPG Health Company, and funded by Bayer. The opinions expressed, and guidance laid out, by the Vision Academy are developed independently by the members and do not necessarily reflect the opinions of Bayer. Intended for healthcare professionals only. Always refer to local treatment guidelines and relevant prescribing information.
April 2025 | MA-PFM-OPHT-ALL-1395-1

References

1. Ferris FL, III, Wilkinson CP, Bird A *et al.* Clinical classification of age-related macular degeneration. *Ophthalmology* 2013; 120 (4): 844–851.
2. Sadda SR, Guymer R, Holz FG *et al.* Consensus definition for atrophy associated with age-related macular degeneration on OCT: Classification of Atrophy Report 3. *Ophthalmology* 2018; 125 (4): 537–548.
3. Chakravarthy U, Bailey CC, Johnston RL *et al.* Characterizing disease burden and progression of geographic atrophy secondary to age-related macular degeneration. *Ophthalmology* 2018; 125 (6): 842–849.
4. Hwang CK, Agrón E, Domalpally A *et al.* Progression of geographic atrophy with subsequent exudative neovascular disease in age-related macular degeneration: AREDS2 Report 24. *Ophthalmol Retina* 2021; 5 (2): 108–117.
5. Capuano V, Miere A, Querques L *et al.* Treatment-naïve quiescent choroidal neovascularization in geographic atrophy secondary to nonexudative age-related macular degeneration. *Am J Ophthalmol* 2017; 182: 45–55.
6. Kataoka K, Gale R, Li X *et al.* Simultaneous GA and CNV/MNV: incidence, characteristics, and treatments: a review. *Graefes Arch Clin Exp Ophthalmol* 2025; Epub ahead of print. doi: 10.1007/s00417-024-06721-5.
7. Sadda SR, Tuomi LL, Ding B *et al.* Macular atrophy in the HARBOR study for neovascular age-related macular degeneration. *Ophthalmology* 2018; 125 (6): 878–886.
8. Gune S, Abdelfattah NS, Karamat A *et al.* Spectral-domain OCT–based prevalence and progression of macular atrophy in the HARBOR study for neovascular age-related macular degeneration. *Ophthalmology* 2020; 127 (4): 523–532.
9. Bailey C, Scott LJ, Rogers CA *et al.* Intralesional macular atrophy in anti-vascular endothelial growth factor therapy for age-related macular degeneration in the IVAN trial. *Ophthalmology* 2019; 126 (1): 75–86.
10. Gillies MC, Hunyor AP, Arnold JJ *et al.* Macular atrophy in neovascular age-related macular degeneration: a randomized clinical trial comparing ranibizumab and aflibercept (RIVAL study). *Ophthalmology* 2020; 127 (2): 198–210.
11. Grob S, Luo J, Hughes G *et al.* Genetic analysis of simultaneous geographic atrophy and choroidal neovascularization. *Eye (Lond)* 2012; 26 (8): 1106–1113.
12. Nassisi M, Lei J, Abdelfattah NS *et al.* OCT risk factors for development of late age-related macular degeneration in the fellow eyes of patients enrolled in the HARBOR study. *Ophthalmology* 2019; 126 (12): 1667–1674.

Recommendation 1: Clinicians and patients should be aware of the potential coexistence and/or development of GA and CNV/MNV

When managing AMD, clinicians should be vigilant and assess for GA in patients being treated for CNV/MNV and for CNV/MNV in patients with GA.

Recommendation 2: *In clinical trials*, multimodal imaging should be performed during assessment for both GA and CNV/MNV

A detailed assessment for both GA and CNV/MNV (including quiescent CNV/MNV) is recommended at each trial visit, including multimodal imaging consisting of fundus autofluorescence (FAF), near-infrared reflectance (NIR), cross-sectional OCT, and OCT-A. Dye-based angiography should also be performed at trial entry and at any time point where there is development of new CNV/MNV.

Recommendation 3: *In clinical practice*, multimodal imaging should be performed at each visit

Multimodal imaging, including FAF, NIR, cross-sectional OCT, and OCT-A, is recommended at each visit. If this is not feasible, at a minimum, cross-sectional OCT should be performed at each visit.

Table. Vision Academy recommendations for the diagnosis and management of simultaneous GA and CNV/MNV

Clinical practice	Research
• Aware of potential coexistence and/or development of GA and CNV/MNV	• A detailed assessment for both GA and CNV/MNV (including quiescent CNV/MNV)
• Assessment for GA in patients being treated for CNV/MNV	• Multimodal imaging (FAF, NIR, cross-sectional OCT, and OCT-A) at each trial visit
• Assessment for CNV/MNV in patients with GA	• Dye-based angiography at trial entry and at any time point when there is development of new CNV/MNV
• Multimodal imaging (FAF, NIR, cross-sectional OCT, and OCT-A) or, at a minimum, cross-sectional OCT at each visit	

Table reproduced from Table 6 in Kataoka K, Gale R, Li X *et al*. Simultaneous GA and CNV/MNV: incidence, characteristics, and treatments. *Graefes Arch Clin Exp Ophthalmol* 2025. https://doi.org/10.1007/s00417-024-06721-5. Reproduced under Creative Commons licence BY 4.0, https://creativecommons.org/licenses/by/4.0/.

Further considerations

Evidence suggests that GA and CNV/MNV are part of a continuum of late-stage AMD, sharing common genetic risk factors and clinical characteristics. Thus, simultaneous GA and CNV/MNV should be considered and assessed using multimodal imaging in the long-term management of late AMD in clinical practice as well as in research into new treatment options. To better inform clinical decision-making, additional systemically collected real-world data on the treatment of simultaneous GA and CNV/MNV are needed.

Vision Academy Viewpoints are intended to raise awareness of a clinical challenge within ophthalmology and provide an expert opinion to engage in further discussion.
The Vision Academy is a group of over 80 international experts who, through their collective expertise, provide consensus guidance for managing clinically challenging situations, especially in areas of controversy or with insufficient conclusive evidence.
The Vision Academy is funded and facilitated by Bayer. This document is based on the Vision Academy publication: Kataoka K *et al. Graefes Arch Clin Exp Ophthalmol* 2025; Epub ahead of print. doi: 10.1007/s00417-024-06721-5 developed by Keiko Kataoka, Richard Gale, Xiaoxin Li, Figen Şermet, Cynthia X. Qian, Chui Ming Gemmy Cheung, Miltiadis K. Tsilimbaris, and Igor Kozak. Medical writing and editorial support was provided by Caudex, an IPG Health Company, and funded by Bayer. The opinions expressed, and guidance laid out, by the Vision Academy are developed independently by the members and do not necessarily reflect the opinions of Bayer. Intended for healthcare professionals only. Always refer to local treatment guidelines and relevant prescribing information.
April 2025 | MA-PFM-OPHT-ALL-1395-1