The Value of Persistence in Neovascular Age-related Macular Degeneration

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Introduction

Untreated neovascular age-related macular degeneration (nAMD) progresses to severe vision loss and potential blindness, representing its natural history. Active treatment targeting vascular endothelial growth factor (VEGF) and Angiopoietin-2 (Ang-2) yields substantial vision improvements as demonstrated in several randomized controlled trials (e.g. Rosenfeld et al 2006, Heier et al 2022).

Objective

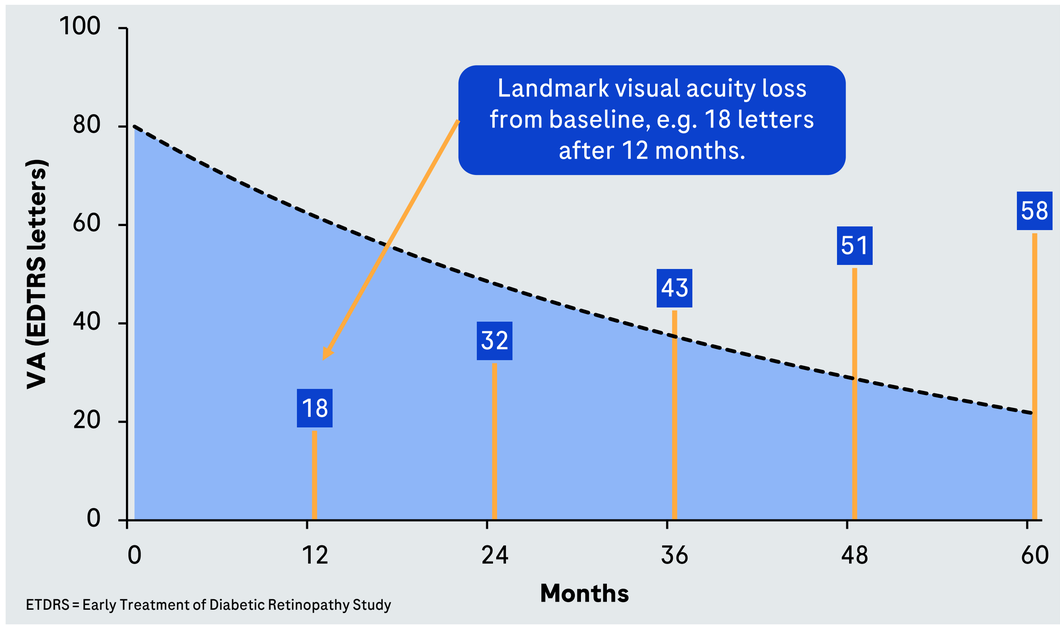
To demonstrate the critical importance of treatment persistence in patients with nAMD for preserving vision and improving quality of life, while exploring the role of disease recurrence. Persistence is defined as staying on effective and sufficient treatment for nAMD.

Method

- This analysis examines the link between treatment discontinuation and disease recurrence, leading to subsequent vision decline.
- Our model illustrates how increased persistence counters the typical progression of visual acuity deterioration, and how this preserved eyesight results in an enhanced quality of life for the patient.
- The base case analysis assumes a patient with bilateral disease and visual acuity of 60 letters to reflect a typical nAMD patient.
- Sensitivity analysis further consider the impact of differences between bilateral and unilateral disease, baseline visual acuity and disease recurrence, acknowledging that some patients may not experience immediate recurrence.

Modelled Natural Course of Visual Acuity nAMD

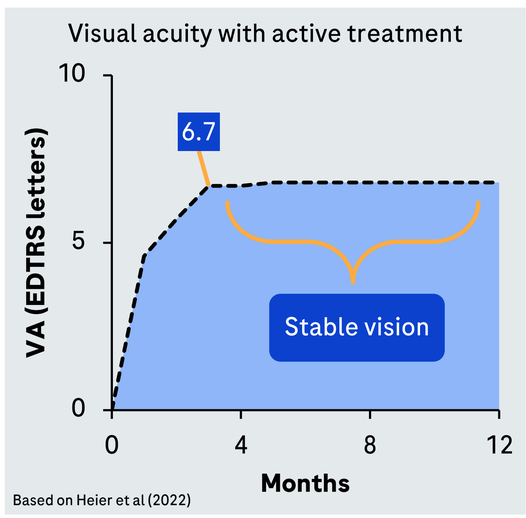
A systematic review and meta-analysis by Elshout et al (2017) on non-treated patients with nAMD highlighted that if left untreated, visual acuity (VA) decreases substantially. This affects quality of life significantly.

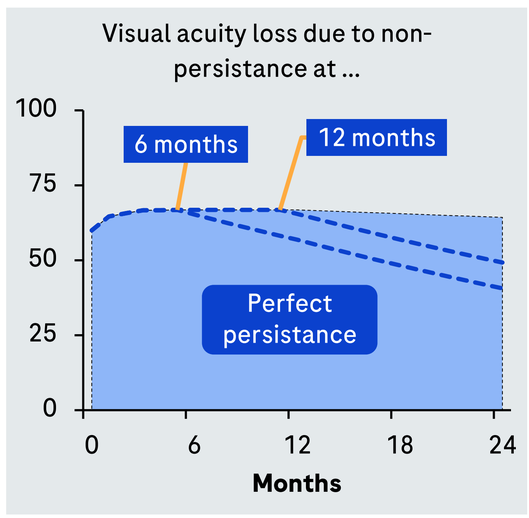


Results (1): Modelling Visual Acuity

Continuous treatment targeting VEGF as shown in the landmark MARINA trial by Rosenfeld et al (2006) and more recently VEGF and Ang-2 by Heier et al (2022) demonstrated preservation of visual acuity and even visual acuity gains.

However, real world persistence data indicates that patients in many countries discontinue treatment already within the first year (e.g. Krieger et al 2025). We link non-persistence at specified timepoints with the natural course of nAMD to model the expected visual acuity decline.

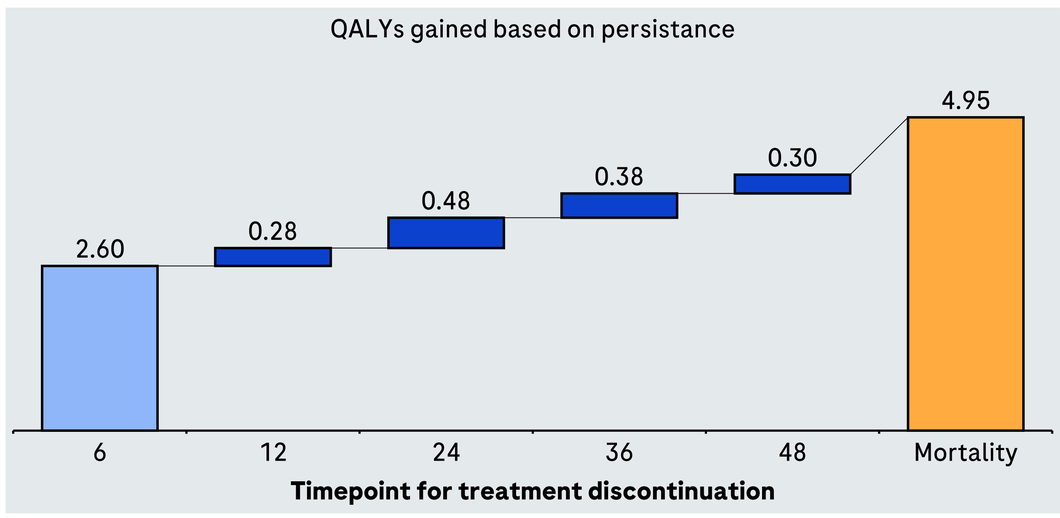




Results (2): Linking Visual Acuity to Quality of Life

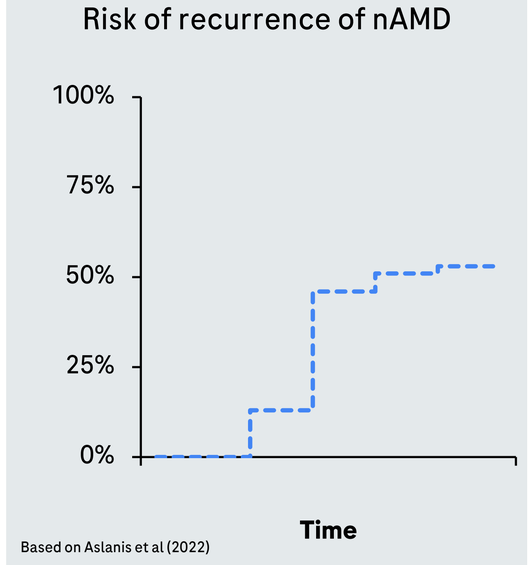
We combine the trajectory for visual acuity on active treatment and after discontinuation into a model accounting for UK general population mortality. Based on Czoski-Murray et al (2009), we map patients' bilateral visual acuity to derive utility values for each persistence scenario.

The results highlight that discontinuing treatment after just one year of treatment is associated with a loss of more than two QALYs. Even late-stage discontinuation after four years leads to a modelled loss of more than one QALY.



Sensitivity analysis

- Sensitivity analysis indicated that while patients with unilateral disease can depend on their healthy eye's vision, early discontinuation of treatment is projected to result in a loss of about half a QALY.
- Varying baseline visual acuity did not significantly alter the base case results.
- Modeling delayed disease recurrence based on Aslanis et al (2022), as some patients might experience, predictably lessened the impact. However, discontinuing treatment within the first year was still linked to a substantial loss of approximately 1.5 QALYs.



Conclusion

Persistence with effective treatment is paramount for patients with nAMD.

Discontinuation of therapy carries a high risk of disease recurrence and vision deterioration, underscoring that in nAMD, persistence equals vision.

References

Elshout, M., Webers, C.A., van der Reis, M.I. et al. Tracing the natural course of visual acuity and quality of life in neovascular age-related macular degeneration: a systematic review and quality of life study. BMC Ophthalmol 17, 120 (2017). https://doi.org/10.1186/s12886-017-0514-3.

Rosenfeld PJ, Brown DM, Heier JS, Boyer DS, Kaiser PK, Chung CY, Kim RY; MARINA Study Group. Ranibizumab for neovascular age-related macular degeneration. N Engl J Med. 2006 Oct 5;355(14):1419-31. doi: 10.1056/NEJMoa054481. PMID: 17021318.

Efficacy, durability, and safety of intravitreal faricimab up to every 16 weeks for neovascular age-related macular degeneration (TENAYA and LUCERNE): two randomised, double-masked, phase 3, non-inferiority trials, Heier, Jeffrey SAbbey, Ashkan et al. The Lancet, Volume 399, Issue 10326,2022, 729 – 740.

Krieger, J., Cox, O., Flacke, JP. et al. Real-world therapy and persistence of patients with neovascular age-related macular degeneration and diabetic retinopathy or diabetic macular edema: a German claims data analysis. Graefes Arch Clin Exp Ophthalmol 263, 713–725 (2025). https://doi.org/10.1007/s00417-024-06690-9.

Carolyn Czoski-Murray, Jill Carlton, John Brazier, Tracey Young, Natalie L. Papo, Hyong Kwon Kang, Valuing Condition-Specific Health States Using Simulation Contact Lenses, Value in Health, Volume 12, Issue 5, 2009, Pages 793-799, ISSN 1098-3015, https://doi.org/10.1111/j.1524-4733.2009.00527.x.

Stamatios Aslanis, Urban Amrén, Charlotte Lindberg, David Epstein, Recurrent Neovascular Age-Related Macular Degeneration after Discontinuation of Vascular Endothelial Growth Factor Inhibitors Managed in a Treat-and-Extend Regimen, Ophthalmology Retina,Volume 6, Issue 1, 2022, Pages 15-20, ISSN 2468-6530, https://doi.org/10.1016/j.oret.2021.03.010.

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