In Pursuit of an Earlier Diagnosis

Home monitoring can help detect wet AMD earlier to reduce the time between disease onset and initiation of treatment.

BY ALLEN C. HO, MD

Anti-VEGF monotherapy as a management strategy to treat patients with wet age-related macular degeneration (AMD) has dramatically improved the prognosis for these patients over the past decade or more. Visual acuity (VA) outcomes, however, have leveled off.

We can address this by identifying disease earlier and initiating anti-VEGF therapy sooner: that is, when choroidal neovascularization (CNV) lesion size is smaller and starting VA is better.

THE NUMBERS SPEAK FOR THEMSELVES

A meta-analysis by Liu et al estimated that patients in randomized controlled clinical trials of wet AMD had the disease an average of 7.7 months before entering those trials.[1] The main determinant of CNV lesion size is the duration of exudative disease, and lesion size correlates with VA. Clinical trial data have repeatedly demonstrated that VA at the time of wet AMD diagnosis is the best predictor of VA outcome after 1 and 2 years of anti-VEGF treatment.[2,3]

Clinical trial data from the past decade, derived from several studies with large sample sizes, reveal that only a limited number of eyes with newly diagnosed CNV were detected when VA was still relatively good (Figure 1). The proportion of eyes with 20/40 or better VA at CNV diagnosis ranged from 13% to 41%, reflecting different VA inclusion criteria for different trials.

Given that the majority of patients start treatment for wet AMD when their VA is already worse than 20/40, we have an opportunity to catch the disease earlier and, as a result, preserve vision.

TAKING A LOOK FOR OURSELVES

My colleagues and I performed a large, real-world retrospective cohort analysis to characterize VA at the time of new-onset wet AMD diagnosis in the first or second eye using the American Academy of Ophthalmology's Intelligent Research in Sight (IRIS) Registry.[4]

The study population was drawn from patients with a diagnosis of wet AMD, designated by first anti-VEGF injection, between January 2013 and June 2017. Included patients were identified by ICD-9 or ICD-10 code during the study period and had received at least two anti-VEGF intravitreal injections in the study eye(s) fewer than 45 days apart. Patients who received anti-VEGF injections in the study eye(s) *before* a diagnosis of wet AMD was made were excluded. More than 160,000 eyes were analyzed.

The mean baseline VA at the time of wet AMD diagnosis was 20/83 (Figure 2), and less than 35% of all eyes had 20/40 or better VA at the time treatment was initiated. When a patient's second eye converted to wet AMD, its VA was only slightly better than the first, a mean 20/79, even when the patient was in the care of a retina specialist and receiving treatment. This relatively poor mean VA at diagnosis corresponds with previously reported baseline VA from the IRIS Registry.[5] The Comparison of Age-Related Macular Degeneration Treatments Trials showed similar

AT A GLANCE

- VA at the time of wet AMD diagnosis is the best predictor of VA outcomes after 1 and 2 years of anti-VEGF treatment.
- Most patients start treatment for wet AMD when their VA is already worse than 20/40.
- For patients, what truly matters is a visual outcome that preserves their functional independence for reading, driving, and daily activities.

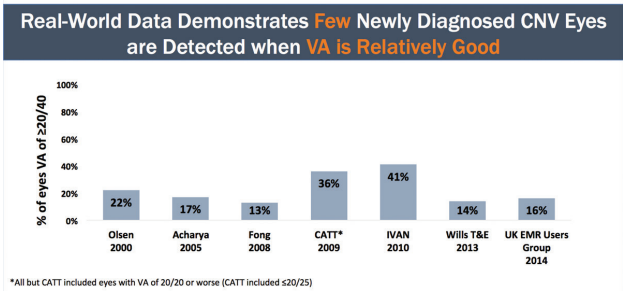
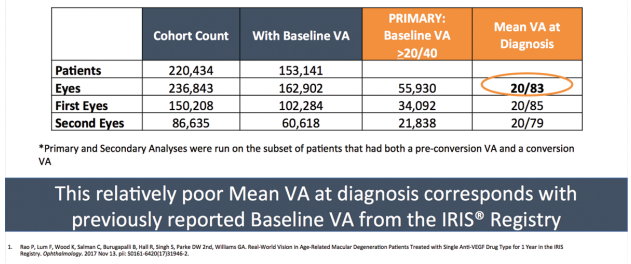


Figure 1. Visual acuity and new-onset AMD in clinical trials.



	Cohort Count	With Baseline VA	PRIMARY: Baseline VA >20/40	Mean VA at Diagnosis
Patients	220,434	153,141		
Eyes	236,843	162,902	55,930	20/83
First Eyes	150,208	102,284	34,092	20/85
Second Eyes	86,635	60,618	21,838	20/79

*Primary and Secondary Analyses were run on the subset of patients that had both a pre-conversion VA and a conversion VA

This relatively poor Mean VA at diagnosis corresponds with previously reported Baseline VA from the IRIS® Registry

1. Rao P, Lum F, Wood K, Salman C, Burugapalli B, Hall R, Singh S, Parke DW 2nd, Williams GA. Real-World Vision in Age-Related Macular Degeneration Patients Treated with Single Anti-VEGF Drug Type for 1 Year in the IRIS Registry. *Ophthalmology*. 2017 Nov 13. pii: S0161-6420(17)31946-2.

Figure 2. Baseline VA and wet AMD diagnosis in IRIS analysis.

results, with approximately 36% of eyes with 20/40 or better baseline VA. This is a far cry from where we want to be—identifying patients sooner, when their VA is better.[6]

Over the long term, the IRIS Registry confirms that, in terms of VA, where an eye starts predicts where it will end. For example, the group with the worst baseline VA (less than 20/32) experienced large relative visual improvement but still ended with the poorest vision at 1 year. Although eyes with 20/25 or better VA at baseline declined somewhat, they still had the best absolute vision at 1 year (Figure 3).

STRIVING TO DO BETTER

VA is an important efficacy outcome when evaluating anti-VEGF clinical trials or choosing a therapy, but letters of vision gained is not a practical endpoint for patients. Our patients want a good quality of life and expect a visual outcome that preserves their functional independence for reading, driving, and enjoying daily activities. That is what truly matters to them.

The use of telemedicine and home monitoring to identify wet AMD earlier in at-risk patients was validated in the AREDS2-HOME study.[7] A total of 1,520 patients were randomly assigned to test their eyes daily with the ForeseeHome AMD Monitoring Program (Notal Vision) plus standard testing or to standard care alone, based on the investigator's preference. Among the participants who used the ForeseeHome preferential hyperacuity perimetry test at the recommended frequency, 94% maintained 20/40 or better VA at the time of CNV detection, compared with 62% of patients in the control arm using traditional detection methods. The study was stopped early due to the clinically significant efficacy of the ForeseeHome program.

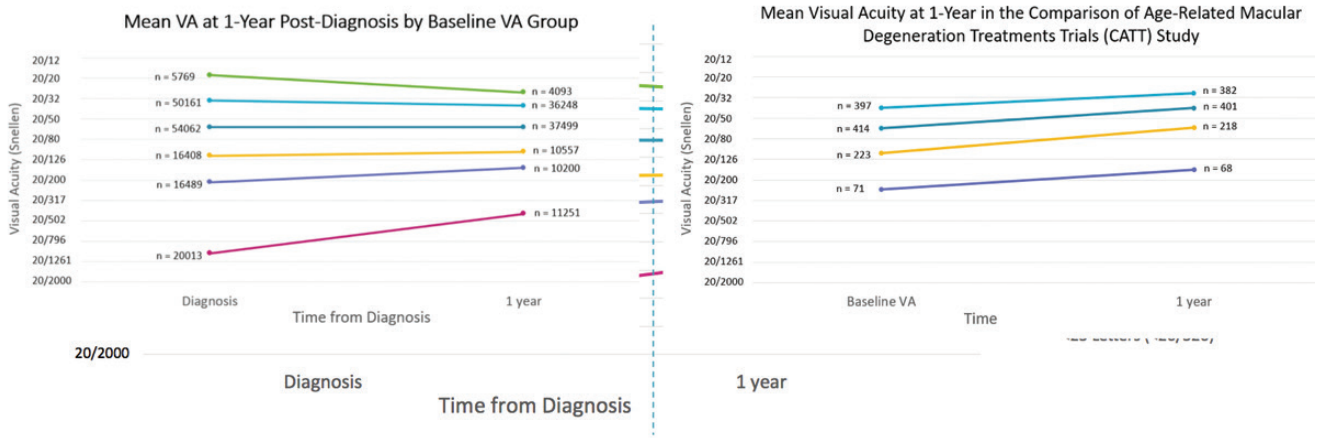


Figure 3. Baseline VA predicts long-term outcomes.

Telemonitoring, or home monitoring, technologies such as the ForeseeHome AMD Monitoring Program can be highly sensitive, are objective, and offer the convenience of at-home testing. Additional insights on which patients may benefit from at-home testing and monitoring are discussed in the sidebar "Who to Monitor" (below).

Other mobile and digital technologies have been introduced to enhance patient monitoring, such as Paxos Telehealth Solution (DigiSight Technologies), which is a comprehensive provider-to-provider telehealth solution designed for ophthalmic consultations within and across health systems. This product includes a HIPAA-compliant cloud-based portal, a vision assessment smartphone application, a mobile imaging device, and analytics that allow physicians to monitor patient data in real time. The mVT (myVisionTrack) App (Vital Art and Science) is an FDA-cleared vision monitoring application that is prescribed to patients by their doctors to track the progression of AMD and diabetic eye disease. Patient test data are automatically uploaded to the physician's portal and monitored. Physicians receive alerts when any significant change in the patient's vision is detected.

AN OPPORTUNITY TO BE SEIZED

Data show that baseline VA is the strongest predictor of long-term visual outcomes in wet AMD. Although anti-VEGF therapy can dramatically improve visual outcomes in patients with wet AMD, we have a greater opportunity to improve absolute vision by employing home monitoring technologies in patients at risk for progression to wet AMD, to cut down on the time between disease onset and treatment, and ultimately to help patients keep what's most important to them: their functional vision. ■

WHO TO MONITOR

Based on the AREDS Research Group's simplified scoring system,[1] each eye is assigned one risk factor for the presence of one or more large (≥ 125 µm) drusen and one risk factor for the presence of any pigment abnormality. Risk factors are added across each eye, yielding a 5-step scale (0-4) on which the approximate 5-year risk of developing advanced AMD in at least one eye increases.

The sequence is:
0 factors = 0.5%
1 factor = 3%
2 factors = 12%
3 factors = 25%
4 factors = 50%

Patients with three and four risk factors should be monitored closely. Any patient for whom AREDS2 supplementation is recommended could benefit from telemonitoring.

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