

# CAN HOME PERIMETRY MAKE GLAUCOMA TRIALS FASTER?



Studies found that portable perimetry was less precise but that more frequent testing might facilitate earlier disease detection.

BY ANDREW POWW, MD

## ON THE FEASIBILITY OF ACCELERATING GLAUCOMA CLINICAL TRIALS USING PORTABLE PERIMETRY

Tan JCK, Montesano G, Crowston J, Bell K, Crabb DP, Jones PR<sup>1</sup>

*Industry support for this study: None*

### ABSTRACT SUMMARY

This cross-sectional study sought to determine whether more frequent portable (ie, home) perimetry could detect glaucomatous progression more

quickly than traditional perimetry in a clinical trial setting.

Forty participants (78 eyes) performed interleaved visual field testing with the portable Eyecatcher 3.0 smartglasses perimeter (Irida Health) and the Swedish Interactive Threshold Algorithm Fast (Humphrey Field Analyzer [HFA], Carl Zeiss Meditec). Test-retest variability for global and pointwise sensitivity was quantified and used in statistical simulations modeling longitudinal

progression detection according to prior precedents<sup>2</sup> under different testing schedules.

Although test-retest precision was lower with the Eyecatcher than the HFA (coefficient of repeatability for mean deviation, 6.37 vs 4.25 dB), simulations suggested that monthly testing with the Eyecatcher offset this limitation and detected a greater proportion of eyes experiencing slow disease progression than HFA testing performed every 4 months. More frequent testing schedules were also predicted to reduce the sample sizes required to detect treatment effects.

## STUDY IN BRIEF

► A cross-sectional study compared test-retest variability with home perimetry using smartglasses (Eyecatcher 3.0, Irida Health) versus the Swedish Interactive Threshold Algorithm Fast (Humphrey Field Analyzer, Carl Zeiss Meditec). The results were then used to model the impact of different frequencies of portable perimetry on clinical trial duration and required sample sizes for detecting the effect of glaucoma treatment on disease progression. Although home visual field assessments were less reliable than standard clinic-based testing, the increased frequency was projected to allow faster or greater detection of glaucomatous progression.

## WHY IT MATTERS

The earlier detection of glaucomatous progression could allow earlier treatment escalation and better prevent irreversible vision loss. Portable perimeters make home visual field testing feasible, which might reduce the logistical and economic burden of glaucoma monitoring while improving patients' access to care. Increased testing frequency through home perimetry might also facilitate clinical trials that rely on visual field progression endpoints. This is particularly relevant given the high cost and long duration of follow-up that have historically made glaucoma neuroprotection trials difficult to conduct. The results of this study suggest that more frequent portable visual field testing might help overcome some of these challenges.

## DISCUSSION

### What is the ideal frequency of visual field testing?

The simulations modeled in this study indicated that, the more frequently testing is performed, the sooner glaucomatous progression is detected, even if the portable device used is less precise than standard clinic-based perimeters. Prior studies, however, have reported decreased rates of patient adherence with weekly compared to monthly testing frequencies.<sup>3,4</sup> The optimal testing frequency remains to be determined and would balance statistical power with patient adherence.

### How does the Eyecatcher 3.0 compare to other head-mounted portable perimeters?

This study did not directly compare portable perimeters.

The reported 95% coefficient of repeatability for mean deviation, however, was 6.37 dB. This value represents the range within which differences between repeated tests may reflect measurement noise rather than true disease progression. For comparison, Tan et al cited prior studies reporting coefficients

of repeatability of approximately 10.75 dB for the VisuAll S (Olleyes) and 7.64 to 8.56 dB for the Imo perimeter (Crewt Medical Systems).<sup>5,6</sup> The Eyecatcher 3.0 also uses a smaller test grid (32 points arranged in a 4 x 8 pattern), which might influence both test duration and variability compared with other perimetric tests.

### Is the Eyecatcher 3.0 device commercially available?

The Eyecatcher 3.0 is an investigational device currently under development and is not yet commercially available.

### FIELDS FROM HOME: DEVICE-INDEPENDENT ONLINE PERIMETRY WITH MELBOURNE RAPID FIELDS

Montesano G, Nathwani N, Yu J, et al<sup>7</sup>  
*Industry support for this study: None*

#### ABSTRACT SUMMARY

This cross-sectional study evaluated the short-term reliability of home visual field testing using a web-based version of the Melbourne Rapid Fields (MRF) software and its agreement with standard perimetry using the HFA.

One hundred adult participants from the Laser in Glaucoma and Ocular Hypertension (LIGHT) trial with prior perimetric testing experience performed two series

of home visual field tests using the web-based MRF platform on their personal computers; they completed the second series 1 week after the first. Agreement with HFA perimetry was assessed using each participant's two most recent HFA tests recorded before study enrollment, and individuals with evidence of unstable fields during the preceding year were excluded.

The MRF demonstrated greater test-retest variability than the HFA and showed proportional bias. The MRF demonstrated a tendency to underestimate visual field deficits in patients with advanced disease. Modeling, however, suggested that more frequent MRF testing could

offset the lower precision and potentially allow earlier detection of visual field progression compared with HFA testing performed every 6 months.

#### DISCUSSION

#### Which patients might be the best candidates for portable or home perimetry?

These technologies may be most useful for patients with moderate glaucoma or suspected disease progression who require closer monitoring between clinic visits. Given the potential adherence challenges with frequent testing, home monitoring might be most valuable when a need for closer surveillance is identified clinically. Successful use also requires that patients be comfortable testing themselves without supervision.

#### What are the practical barriers to implementing home perimetry in routine glaucoma care?

Remote testing introduces several limitations. Environmental factors such as ambient lighting and viewing distance cannot be standardized, and screen display characteristics vary across personal devices. In addition, differences in testing strategies make directly comparing results between home-based and conventional perimetry inadvisable. Cost considerations and the absence of clear reimbursement pathways are additional significant barriers to widespread adoption.

## STUDY IN BRIEF

- A cross-sectional study evaluated the short-term reliability of home visual field testing using a web-based version of the Melbourne Rapid Fields software and its agreement with standard perimetry using the Humphrey Field Analyzer (Carl Zeiss Meditec). The feasibility and patients' acceptance of home testing were assessed, and its power to detect glaucomatous progression at different testing frequencies was modeled. Results were more variable with home perimetry, but greater testing frequency could offset the lower precision and allow earlier detection of visual field progression.

### WHY IT MATTERS

The results of this study reinforce those of Tan and colleagues,<sup>1</sup> both of which suggest that home perimetry may detect glaucomatous progression earlier than conventional testing schedules despite lower per-test precision. Given that it can be flexibly accessed with a personal computer, laptop, or smart tablet, web-based testing might be easier to implement and more accessible to patients than smartglasses or other head-mounted perimetry platforms. The cost structures and real-world implementation of these technologies require further exploration.

## Is the web-based MRF test available for use?

Although the test can be accessed online, its use is tied to research studies and clinician-supervised home monitoring programs. ■

1. Tan JCK, Montesano G, Crowston J, Bell K, Crabb DP, Jones PR. On the feasibility of accelerating glaucoma clinical trials using portable perimetry. *Ophthalmol Glaucoma*. 2026;9(1):106-116. doi:10.1016/j.ogla.2025.08.004
2. Chauhan BC, Garway-Heath DF, Gohi FJ, et al. Practical recommendations for measuring rates of visual field change in glaucoma. *Br J Ophthalmol*. 2008;92(4):569-573. doi:10.1136/bjo.2007.135012
3. Prea SM, Kong GYX, Guymer RH, Vingrys AJ. Uptake, persistence, and performance of weekly home monitoring of visual field in a large cohort of patients with glaucoma. *Am J Ophthalmol*. 2021;223:286-295. doi:10.1016/j.ajo.2020.10.023
4. Jones PR, Campbell P, Callaghan T, et al. Glaucoma home monitoring using a tablet-based visual field test (Eyecatcher): an assessment of accuracy and

adherence over 6 months. *Am J Ophthalmol*. 2021;223:42-52. doi:10.1016/j.ajo.2020.08.039

5. Nascimento e Silva R, Kim JA, Li Y, et al. Repeatability of a virtual reality headset perimeter in glaucoma and ocular hypertensive patients. *Transl Vis Sci Technol*. 2024;13(6):14. doi:10.1167/tvst.13.6.14
6. Matsumoto C, Yamao S, Nomoto H, et al. Visual field testing with head-mounted perimeter "imo". *PLoS One*. 2016;11(8):e0161974. doi:10.1371/journal.pone.0161974
7. Montesano G, Nathwani N, Yu J, et al. Fields from home: device-independent online perimetry with Melbourne Rapid Fields. *Br J Ophthalmol*. Published online January 6, 2026. doi:10.1136/bjo-2025-328016

---

## JAMES C. TSAI, MD, MBA | SECTION EDITOR

■ President, New York Eye and Ear Infirmary of Mount Sinai, and Delafield-Rodgers Professor and System Chair, Department of Ophthalmology, Icahn School of Medicine at Mount Sinai, New York

- Member, *GT* Editorial Advisory Board
- jtsai@nyee.edu
- Financial disclosure: Consultant (AI Nexus Healthcare, Eyenovia, Ophthalmic Therapeutic Innovation, Smartlens, Théa Pharma)

## ANDREW POWW, MD

- Assistant Professor, Glaucoma Service; Director of Provider Informatics (Ophthalmology); and Medical Director of Perimetric Services, University of Iowa Carver College of Medicine, Iowa City, Iowa
- andrew-pouw@uiowa.edu
- Financial disclosure: None