

# Virtual Reality Perimetry versus Conventional Perimetry: Balancing Patient Comfort and Reliability

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## Dear Editor,

Perimetry is used to assess the visual field, using kinetic or static stimuli to evaluate retinal sensitivity and detect the visual pathway to light stimuli (1). Perimetry remains a cornerstone in the diagnosis and monitoring of glaucoma and other optic neuropathies. While conventional automated perimetry, such as the Humphrey Visual Field Analyzer, has long been considered the gold standard, its limitations include patient discomfort, fatigue, and reduced compliance during repeated testing. These factors often compromise test reliability, leading to variable outcomes that can obscure true disease progression (2).

Recent advances in virtual reality (VR) technology have introduced portable head-mounted perimetry devices that simulate visual field testing in an immersive and controlled testing environment, reduce testing times, increase portability, and improve accessibility, particularly for patients in underserved or far-flung areas (1). Studies report that patients generally find VR perimetry more comfortable, with the potential to create more dynamic and interactive testing experiences with reduced physical strain and less need for frequent repositioning (3,4). Importantly, the portability of VR platforms may also enhance accessibility in community and low-resource settings.

However, VR perimetry looks promising and useful; there are still ongoing doubts and concerns regarding reliability and standardization. While early trials show good correlation with conventional perimetry, discrepancies remain in detecting subtle defects, test—retest variability, and long-term reproducibility (5), further complicating its interpretation, raising questions about its consistency in routine monitoring of progressive diseases such as glaucoma. Moreover, when evaluated for glaucoma screening and general visual field assessment, only a limited number of VR-based devices have demonstrated a strong correlation with the established gold standard, suggesting that device-specific variability is a significant challenge (6). Integration of VR perimetry into clinical practice will therefore require not only rigorous methodological validation and standardization of protocols, but also the development of robust normative datasets, assessment of cost-effectiveness, and evaluation of its acceptance among patients and clinicians. If these barriers are adequately addressed, VR perimetry could evolve into a viable alternative to conventional visual field testing, especially in resource-limited or community-based screening settings.

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In conclusion, VR-based perimetry holds potential to improve patient experience and expand access to visual field testing. Nonetheless, until robust evidence confirms equivalence in reliability to conventional ones, VR systems should be considered complementary rather than replacements. Continued research is needed to establish their role in routine ophthalmic practice.

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#### Author contribution statement

**E.H:** Conceptualization, Methodology, Software, Data curation, Writing Original draft preparation, Reviewing and Editing; **S.N.U.S:** Writing Original draft preparation, Reviewing, and Editing; **A.A:** Writing Original draft preparation, Reviewing, and Editing.

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