

Virtual Reality-Based and Conventional Visual Field Examination Comparison in Healthy and Glaucoma Patients

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PURPOSE: Clinically evaluate the noninferiority of a custom virtual reality (VR) perimetry system when compared to a clinically and routinely used perimeter on both healthy subjects and glaucoma patients.

METHODS: We use a custom-designed VR perimetry system tailored for visual field testing. The system uses Oculus Quest VR headset (Facebook Technologies, LLC, Bern, Switzerland) , that includes a clicker for participant response feedback. A prospective, single center, study was conducted at the Department of Ophthalmology of the Bern University Hospital (Bern, Switzerland) for 12 months. Of the 114 participants recruited 70 subjects (36 healthy and 34 glaucoma patients with early to moderate visual field loss) were included in the study. Participants underwent perimetry tests on an Octopus 900 (Haag-Streit, Köniz, Switzerland) as well as on the custom VR perimeter. In both cases, standard dynamic strategy (DS) was used in conjunction with the G testing pattern. Collected visual fields (VFs) from both devices were then analyzed and compared.

RESULTS: High mean defect (MD) correlations between the two systems (Spearman, $r = 0.75$) were obtained. The

CONCLUSIONS: This study demonstrates that a clinically used perimeter and the proposed VR perimetry system have comparable performances with respect to a number of perimetry parameters in healthy and glaucoma patients with early to moderate visual field loss.

TRANSLATIONAL RELEVANCE: This suggests that VR perimeters have the potential to assess VFs with high enough confidence, whereby alleviating challenges in current perimetry practices by providing a portable and more accessible visual field test.

Transl Vis Sci Technol. 2021 Oct 4;10(12) :10. doi: 10.1167/tvst.10.12.10.

PMID: 34614166 PMCID: PMC8496417 DOI: 10.1167/tvst.10.12.10