

Augmented Reality for Parkinson's Rehabilitation: A Feasibility Study of Remotely Monitored Cueing-based Games

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Focus on:

- Innovative treatments and technologies in healthcare
- Improving patient outcomes and experience
- Prevention of falls
- Analogue to digital
- Hospital to home

Background: Parkinson's is a neurodegenerative condition that causes severe movement impairments and places people at risk of falls. The number of people with Parkinson's (PwP) globally is expected to double in the next two decades(1). PwP are advised to exercise regularly to maintain their mobility and balance(2), specifically using sensory cueing, which is a highly beneficial treatment for freezing of gait(3), one of the most difficult aspects of living with Parkinson's. Maintaining an exercise programme to achieve the effective dose of rehabilitation can be challenging and becomes more difficult over time, leading to reduced function and deteriorating quality of life.

Aim: To investigate the use of RealityDTX®, a novel cueing-based rehabilitation programme for PwP, delivered through augmented reality headsets at home(4).

Methods: Thirty PwP were recruited. Each participant had baseline and follow-up assessments in clinic. Individual game-based rehabilitation was prescribed for home use for 6 weeks with remote monitoring and weekly telephone appointments. Primary outcome measure was the Timed-Up-and-Go (TUG). Secondary outcome measures included the Lindop Parkinson's Assessment Scale (LPAS)(5). Statistical analysis comprised parametric and non-parametric methods appropriate to the data. (IRAS: 321744; NCT05794542).

Results: 30 participants were recruited; 2 participants withdrew; 1 yet to complete. Interim results on 27 participants: mean TUG improved from 13.4s to 10.5s ($p < 0.001$) and the LPAS improved from 27 to 29 ($p < 0.01$). No falls, near falls or other adverse events were reported.

Conclusion: Novel game-based exercises through augmented reality headsets were successfully used to deliver rehabilitation for PwP in their homes with participants' mobility improved and no adverse effects reported. A NIHR-funded, multi-site randomised controlled trial (NIHR206530) based on the results of this feasibility trial is planned to start later this year to investigate the clinical- and cost-effectiveness of this technology.

References:

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