

Introduction

- Patients with Mild Cognitive Impairment (MCI) and Mild Alzheimer's Disease (AD) can have fluctuations in their cognitive abilities.
- A rapid change could indicate a serious health condition such as delirium.
- No clinical tools for measuring disease progression are currently available to frequently collect data on and monitor cognition at home.
- A rapid, accurate tool to monitor cognitive function at home could act as a "cognitive" vital sign" as an early warning for a change in cognition or delirium.
- We have designed a "serious game" task called the D-Cog to adaptively measure spatial working memory, a component of cognition, while at home using an iPad.

Objectives

1. To establish the feasibility and assess user acceptance of the D-Cog task in daily at-home usage for both cognitively impaired and control populations.

2. To determine whether the D-Cog, through frequent measurements, can detect disease progression and more subtle changes (such as delirium-induced) in cognitive ability compared to standardized assessments.





Developing a Home Cognitive "Vital Sign" to Detect Cognitive Changes in Alzheimer's Disease

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Timeline for overall project												
nth	1	2	3	4	5	6	7	8	9	10	11	12
alize app egration		Data Collecton (6 months) (n=25)							Analysis + App release			

configurations and other meta-

- Pilot Testing:
- performance and MMSE scores
- Mild AD Participants able to understand D-Cog when shown one round while testing in clinic
- Participants showed High engagement and interest in using at home to track disease progression
- D-Cog scores compare well against standardized pen-and-paper neuropsychological scores, and the D-Cog offers the convenience of frequent and athome administration.
- If long-term, at-home administration is successful, it could not only measure rapid changes (e.g., delirium), but also the gradual progression of Alzheimer's.
- The test could help clinicians monitor a patient's cognitive status and test new interventions to slow disease progression.

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PennAlTech **D-Cog Gameplay** mindLamp

Conclusions

• Strong correlation between D-Cog

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