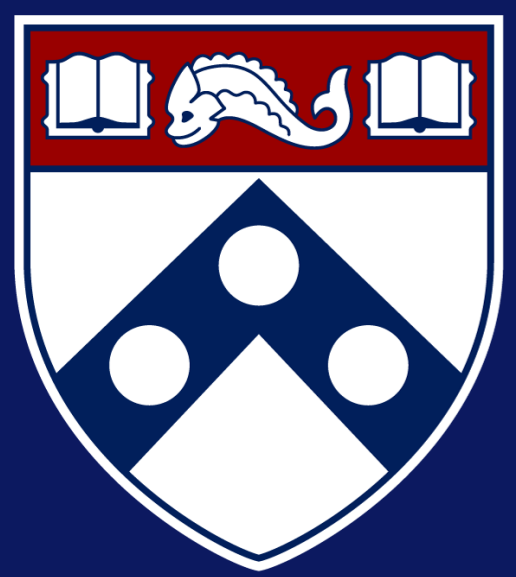




NewCourtland Center
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UNIVERSITY of PENNSYLVANIA
SCHOOL of NURSING

Baseline Cognitive Performance And Longitudinal Fall Risk Among Older Adults With Mild Cognitive Impairment

Hannah Cho, PhD¹; Liming Huang, PhD¹; Sean Harrison, MPH¹; George Demiris, PhD^{1,2}

¹School of Nursing, University of Pennsylvania, United States · ²Perlmutter School of Medicine, University of Pennsylvania

BACKGROUND

- Fall-related events are a major source of injury and mortality among community-dwelling adults aged ≥65; approximately one-third experience a fall each year.
- Cognitive process—especially executive function and attention—support gait control, dynamic balance, and motor-cognitive integration that help prevent falls.

Knowledge Gap: The timeline of cognitive decline and its longitudinal link to increasing fall risk across specific cognitive domains over a 1-year period is not well understood

- Cross-sectional studies cannot determine whether cognitive precedes, coincides with, or follows fall-related events.
- Longitudinal research is needed to clarify directionality and identify key windows for intervention.

Objective

- Examine 1-year longitudinal trajectories of cognitive function (global, executive, episodic memory, and processing speed) in community-dwelling older adults with mild cognitive impairment

METHODS

Study design & participants

- Prospective longitudinal cohort study (Sense4Safety; PI: Demiris) - Parent study
- Community-dwelling adults aged ≥65 years with mild cognitive impairment, recruited from Philadelphia, PA.
- Exclusion: dementia at baseline, inability to walk or live independently, or acute illness

Cognitive assessments (NIH Toolbox)

- Flanker Inhibitory Control & Attention, List Sorting Working Memory, Dimensional Change Card Sort, Picture Sequence Memory

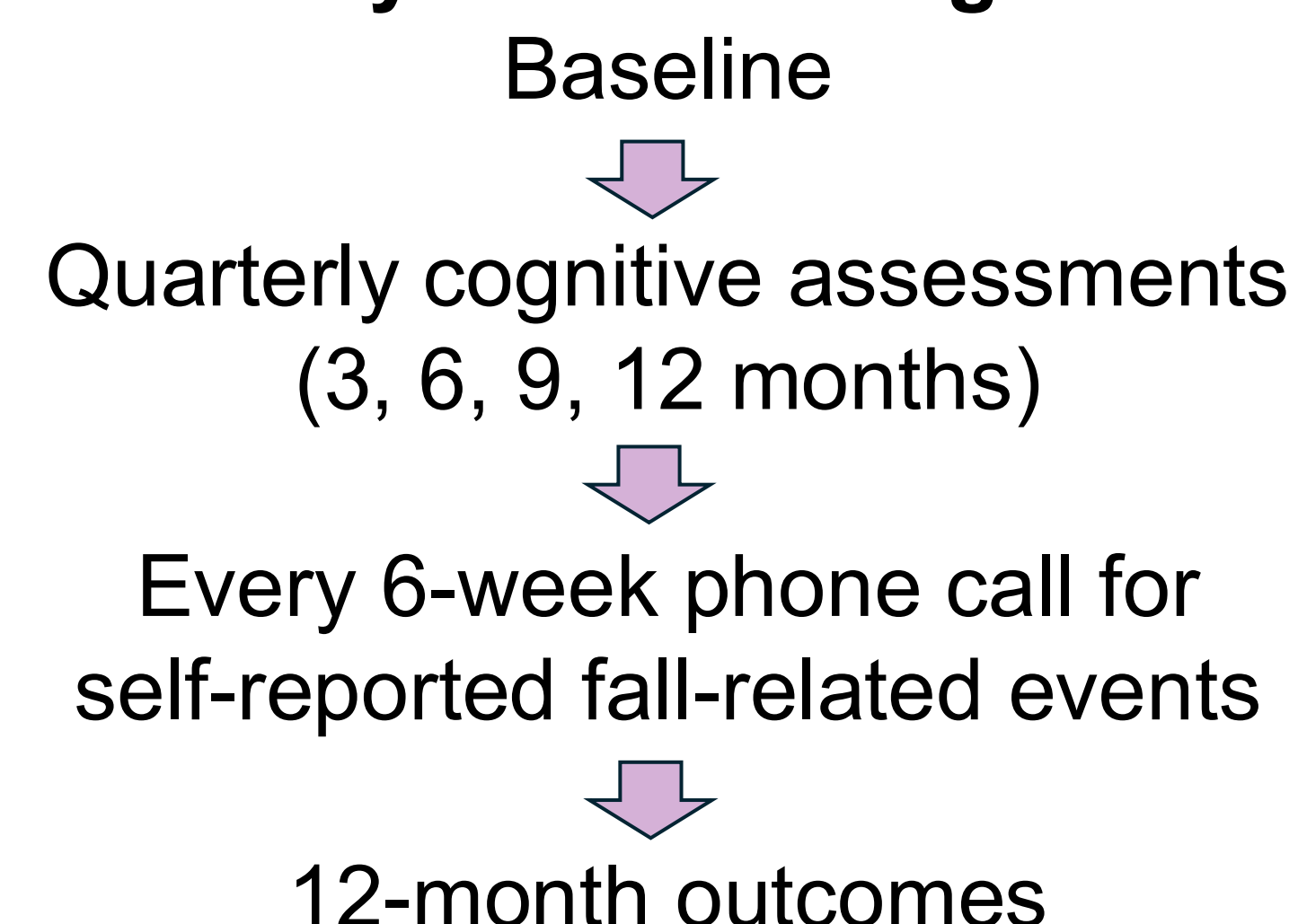
Fall ascertainment

- Any fall and recurrent fall-related event (stumbling, loss of balance)

Statistical analysis

- Mixed Effects Logistic Models for cognitive trajectory. Adjusted for age, sex, assisted devices use, count of chronic conditions.
- Significance: $p < 0.05$ (two-tailed)

Study Timeline Diagram



RESULTS

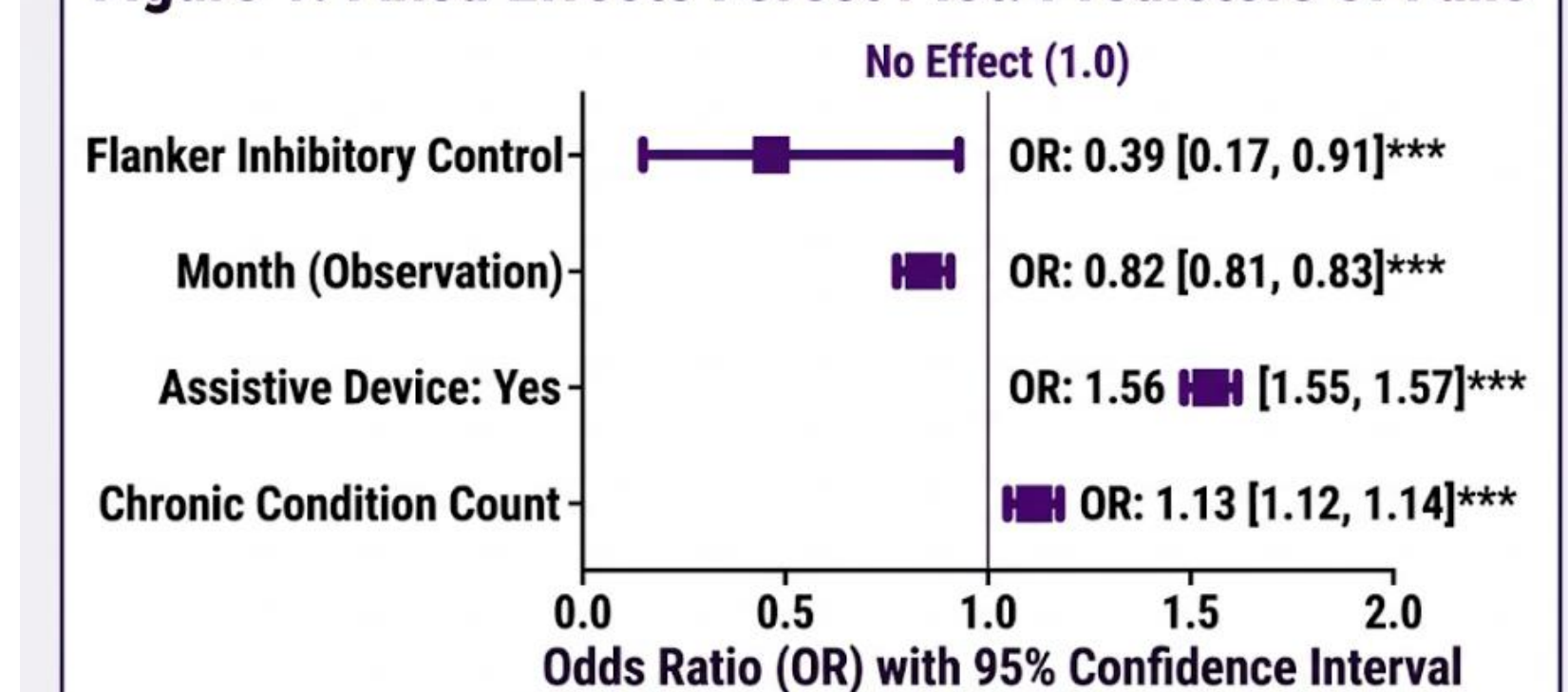
CHARACTERISTICS OF PARTICIPANTS

- N = 101 community-dwelling older adults with MCI
- Mean age: 74 years
- 84% female, 58% Black/ African American, 44% reported some college education (44%)

Key Findings

- Higher baseline Flanker Inhibitory Control scores were associated with lower odds of falls over 12 months (See Figure 1) Odd ratio 0.39 (95% CI: 0.17- 0.91)
- No significant associations were observed for the other cognitive measures
- Significant random intercept variance suggested substantial between-person variability in fall risk

Figure 1. Fixed Effects Forest Plot: Predictors of Falls



*Significant predictors ($p < 0.001$)

FUTURE IMPLICATIONS & CONCLUSIONS

- Cognitive measures related to attention and executive function may be useful for identifying older adults with increased fall risk.
- Cognitive assessment could complement technology-supported fall prevention approaches.
- Future studies may examine dual-task cognitive-motor interventions and wearable sensor-based fall