Background
• Clinical trials for prevention and early intervention in preclinical AD require measures with increased sensitivity to subdefties in instrumental activities of daily living (IADLs) that comprise the first functional declines in prodromal disease.

The Virtual Reality Functional Capacity Assessment Tool (VRFCAT) is a performance-based assessment of IADL functioning that has demonstrated sensitivity to functional declines in individuals with subjective and objective cognitive decline (Akins et al., in press).

• The current pilot study evaluates use of the VRFCAT in individuals formally diagnosed with MCI or Mild AD

Method
• Participants included 11 individuals with MCI and 9 individuals with Mild AD (Fig. 2).

• Participants completed the VRFCAT in conjunction with standard assessments of cognition and functioning including the MMSE, Clinical Dementia Rating (CDR), and partner-reported activities of daily living (AADS-ADL, MCI; Fig. 3). CDR data was missing for one participant in the MCI group.

• VRFCAT outcomes included the following:
  - Total Adjusted Time: time to complete each VRFCAT objective, adjusted for error messages and inactive bus travel time.
  - Total Errors: number of errors summed across all objectives.
  - Total Forcible Progressions: number of objectives the participant was unable to complete independently. The VRFCAT program automatically provides assistance following more than 5 errors or 5 minutes spent in any single objective.

Results
• All but two participants were able to complete the VRFCAT. Based on CDR staging, these two subjects had progressed beyond mild AD at the time of the study visit (both had global CDR=2, corresponding to moderate AD). Data analysis was performed using data from the remaining 7 participants with Mild AD, and all 11 participants with MCI.

• Participants with Mild AD performed significantly worse than those with MCI, taking longer to complete each objective and to normative data available for 240 healthy individuals age 55 and older.

• To assess the relationship between measures, correlations between VRFCAT outcomes and standard assessments were conducted using Pearson correlation coefficients.

• Strong correlations with cognition and partner assessments of cognition and functioning including the MMSE (r=.80, p<.001), CDR (r=.78, p<.01), and ADL-MCI; Fig. 3); CDR data was missing for one participant in the Mild AD group.

Conclusions
• Pilot findings suggest the VRFCAT may provide a sensitive tool for evaluation of ADL functioning in individuals with cognitive decline and justify formal validation in a larger sample size.

• In its current form, the VRFCAT is likely best suited for use in the earliest stages of AD, prior to the onset of frank dementia. Sensitivity to differences between healthy older adults and those with MCI are robust.

• The frequency of forced progressions in the Mild AD group suggests the VRFCAT may have reduced sensitivity to changes in mild-moderate disease.

• Strong correlations with cognition and partner-reported function suggest the VRFCAT is uniquely suited for performance-based assessment of function in clinical trials in preclinical AD and MCI, as well as longitudinal investigations regarding the relationship between cognition and function.