older adults with early pre-diabetic changes in energy metabolism as indicated by hyperinsulinemia and peripheral insulin resistance. **Objective:** To examine the effect of peripheral insulin resistance on cerebral glucose metabolism at rest and during a memory task, and to evaluate whether regional changes are consistent with brain glucose metabolism changes noted for adults in the earliest stages of Alzheimer's disease. **Methods:** 20 older adults, 10 of whom were insulin resistant, underwent resting and cognitive activation CMRglu PET imaging using [F-18]FDG on separate days, in counterbalanced order. Insulin resistant adults were identified using an insulin sensitivity index derived from an oral glucose tolerance test. The groups were comparable in age, education, physical health (with the exception of glucoregulatory status), and overall cognitive function. The imaging protocol consisted of a 30-minute transmission scan, an IV injection of 5 mCi [F-18]FDG, a 40-minute uptake period, and a 30-minute emission scan. In the activation condition, a 35-minute cognitive task was initiated at the time of tracer injection. For this task, subjects were instructed to remember a repeating list of 20 words that were randomly presented in series through earphones. Delayed free recall was assessed 50 minutes following task completion. PET images were analyzed using standard brain mapping techniques, and subtracted images were averaged across subjects to form statistical maps. **Results:** In the resting condition, CMRglu was significantly decreased for the insulin resistant adults relative to controls in right posterior parietal and left inferior temporal regions. Areas of hypermetabolism were also apparent in cortical regions surrounding the hypometabolic areas. In the activation condition, task-related activation was reduced in the right inferior frontal gyrus for insulin resistant vs. controls. **Conclusion:** These findings indicate that peripheral insulin resistance has clear effects on cerebral glucose metabolism, both at rest and during task performance. Moreover, these changes resemble those that have been previously reported for older adults in the preclinical stages of Alzheimer's disease, thereby lending support to the idea that insulin dysregulation may play a role in Alzheimer pathology.

P2-225 A NOVEL MARKER OF MILD COGNITIVE IMPAIRMENT

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Background: Recent research suggests that early cognitive decline can be detected by changes in motor measures such as walking speed. These results have been based on infrequent tests that reflect sparse snapshots of an individual's performance and thus cannot account for daily variability in performance. Continuous measures of activity, gathered in the home environment, may provide a more sensitive measure of changes predictive of cognitive decline. **Objective(s):** To determine if continuous unobtrusive measures of in-home activity can differentiate healthy elders from those with mild cognitive impairment (MCI). **Methods:** More than 108,000 person-hours of continuous activity data were collected for elderly subjects living independently, using motion sensors and contact sensors. These data were collected unobtrusively in subject homes for up to 60 weeks (mean 46 ± 12 weeks) without requiring the subjects to wear any devices or to interact with research staff during the monitoring period. Data for each subject were analyzed to assess speed of walking and daily activity levels. Variance in daily activity over time scales ranging from one to 24 hours was estimated using Detrended Fluctuation Analysis. Walking speed was estimated using restricted-field sensors along a hall in each home. 7 elderly subjects with MCI (88 ± 3.5 years) and 7 cognitively healthy (CH) elders (90 ± 4.1 years) participated. All subjects had normal motor function as measured by modified UPDRS scores (1.86 ± 2.07). Groups did not differ on gender, education, ADLs, clinic-measured walking speed, or number of rooms in their homes. **Results:** MCI subjects had longer walking times than the healthy elderly group (MCI: 19.2 ± 4.2 seconds; CH: 15.3 ± 4.5 seconds; time to walk 10 meters). In addition, the variance was higher in the MCI group than in the healthy elderly group at all time scales (MCI: 0.94 ± 0.08; CH: 0.85 ± 0.12). The intra-group variability in these measures was much less in the MCI group than in the control group. **Conclusions:** Continuous in-home assessment provided a sensitive measure of differences in activity between MCI and healthy elders. This approach may provide new opportunities for unobtrusively studying early cognitive decline in the community.

P2-226 MILD COGNITIVE IMPAIRMENT: THE DIAGNOSTIC UTILITY OF INITIAL PRIMARY CARE EVALUATION, MAGNETIC RESONANCE IMAGING AND COMPREHENSIVE NEUROPSYCHOLOGICAL ASSESSMENT

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Background: Patients experiencing Mild Cognitive Impairment (MCI), or memory loss greater than expected for age, is on the rise. Although these patients with MCI have memory problems greater than expected, they do not evidence other symptoms of dementia such as impaired reasoning or judgment. Therefore, MCI is often not readily detected or diagnosed. Early detection methods and treatment may improve patient prognosis and care as well as reduce the strain on family, economic and health care systems. **Objective:** To determine and utilize the most reliable diagnostic tools for early detection of MCI. **Methods:** 240 geriatric patient charts were reviewed. The geriatric patients were referred to the University of North Texas Health Science Center for neuropsychological evaluation. Of the initial 240 charts, 83 (25 males, 58 females; mean age 77.7, SD 7.6 years, range 57-93 years) met inclusion criteria of initial primary care diagnosis, Magnetic Resonance Imaging (MRI) and comprehensive neuropsychological assessment. **Results:** Initial primary care diagnosis (PC), MRI and comprehensive neuropsychological assessment diagnosis (NP) were categorized as follows: MCI, Neurodegenerative Dementia (i.e., Alzheimer's disease, fronto-temporal dementia, Pick's Disease), Vascular Dementia and Mixed (e.g., meeting criteria for both Neurodegenerative and Vascular Dementias). 86% of initial PC diagnoses of MCI were not supported by MRI findings. Additionally, 80% of PC diagnoses were not supported by NP findings. Sensitivity, specificity and positive predictive value are higher for NP than PC. Doctors' initial screen for memory impairment may account for MCI to a higher degree than MRI findings. However within this sample, other variance is accounted for by an increased detection in neurodegenerative and vascular dementia with NP testing. **Conclusion:** The use of neuropsychological assessments is crucial in detecting MCI. Although the initial primary care diagnosis accounts for MCI, oftentimes patients do not receive additional evaluative methods until further declines in memory are noted. Recent research examining the effects of medication to delay the transition from MCI to Alzheimer's disease warrants a proactive approach in identifying and treating MCI.

P2-227 ACCOUNTING FOR MEASUREMENT PRECISION IN A SIMULATED LONGITUDINAL STUDY OF COGNITIVE FUNCTIONING DRAMATICALLY IMPROVED THE ACCURACY OF ESTIMATES OF THE RATE OF CHANGE

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Background: Tests such as the MMSE, 3MS, CASI, and CSI 'D' are used in epidemiological studies and randomized controlled trials to follow the course of cognitive functioning over time. These tests are characterized by varying levels of measurement precision across the ability continuum, with greater precision for those with cognitive deficits than for those with normal or superior cognitive functioning. **Objective(s):** To demonstrate the importance of accounting for measurement precision in longitudinal studies employing cognitive tests.