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### Title

CROSS-SECTIONAL AND LONGITUDINAL RELATIONSHIPS BETWEEN REST-ACTIVITY RHYTHMS AND INFLAMMATION IN OLDER MEN

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usual time of day for peak activity, regularity of circadian patterns) and incident dementia risk. The second presentation will present findings pertaining to understanding the link between sleep disturbance and inflammation (a substantial contributor to cognitive aging). The third will examine whether detailed daytime activity patterns associate with imaging-based brain volumes, independent of sleep disturbance. The final presentation will explore whether initiation of sleep disorder treatments may have the potential to change trajectories of cognitive performance as individuals age. Overall, the symposium will highlight the importance of sleep and activity patterns to brain health and stimulate discussion about improving sleep and circadian disruption as a target for dementia prevention efforts.

#### ANALYSIS OF REST-ACTIVITY RHYTHMS AND RISK OF INCIDENT MILD COGNITIVE IMPAIRMENT AND DEMENTIA IN OLDER WOMEN

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In older adults, desynchronized circadian rhythms have been associated with medical illness, including Alzheimer Disease. Activity, which can be easily measured using actigraphy over consecutive 24-hour periods, is a valid marker of entrained sleep phase and correlates with entrained endogenous circadian phase. We compare results of both parametric and non-parametric analyses to test the association of rest-activity patterns with incident MCI and dementia in 2132 older women who had 2 or more 24-hrs periods of actigraphy data collected at baseline. Follow-up neuropsychological testing approximately 5 years later is used to classify women as normal, MCI, or dementia. Logistic regression models are adjusted for age, clinic site, race, education, body mass index, functional status, comorbidities, medication use, and health habits. Results suggest the importance of overall amplitude and rhythmicity, as well as timing of activity patterns over the 24-hour day as risk factors for incident MCI/dementia.

#### CROSS-SECTIONAL AND LONGITUDINAL RELATIONSHIPS BETWEEN REST-ACTIVITY RHYTHMS AND INFLAMMATION IN OLDER MEN

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Sleep disturbances and physical inactivity have been associated with chronic inflammation, an important risk factor for cognitive decline in the aging population. However most previous studies focused on the cross-sectional relationships between sleep and physical activity and inflammation. In the Outcomes of Sleep Disorders in Older Men (MrOS Sleep) study, we studied both the cross-sectional and prospective associations between characteristics of 24-hour rest-activity rhythms measured by actigraphy and inflammation index measured by multiple circulating markers. In cross-sectional analysis, a lower amplitude is associated with elevated inflammation (Odds ratio Q4 vs Q1 (95% Confidence interval): 1.65 (1.22, 2.24)). In prospective analysis, an earlier acrophase (<12:30) is associated with a two-fold increase in the risk of developing elevated inflammation over four years of follow up (2.08 (1.02, 4.23)). No individual inflammatory markers are associated with rest-activity rhythms. Our findings suggest that rest-activity rhythm characteristics predicts elevated inflammation.

#### ASSOCIATION BETWEEN BRAIN VOLUMES AND PATTERNS OF COMMUNITY-DWELLING PHYSICAL ACTIVITY

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With aging, brain structural integrity may influence patterns of physical activity (PA) performed in community-dwelling settings. In 281 cognitively-intact adults aged  $\geq 65$  years, linear regression models were fitted to examine whether MRI brain volumes (cc), assessed using an automated multi-atlas approach, were cross-sectionally associated with accelerometer-derived: 1) daily PA minutes and 2) activity fragmentation defined as the ratio of # of contiguous PA minutes over total PA minutes  $\times 100$ . Higher white matter in the parietal and temporal lobes were associated with more daily active minutes (2.8 (SE=1.0) and 3.1 (0.9) min/day, respectively;  $p < 0.005$  for both) after adjusting for demographics, behavioral factors, medical conditions, and intracranial volume. Higher white matter in the temporal region was associated with lower fragmentation (-0.15 (0.05) %,  $p = 0.004$ ). Our results suggest sensorimotor-related brain morphometry is connected with both the amount and manner in which PA is performed throughout the day in well-functioning older adults.

#### COGNITIVE TRAJECTORIES BEFORE AND AFTER SLEEP TREATMENT INITIATION IN U.S. OLDER ADULTS WITH SLEEP DISTURBANCE

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