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Alterations in 24-hour movement patterns, or circadian rest/activity rhythms (RARs), commonly occur with aging. Using linear mixed effects (LME) modeling, we examined associations of baseline RARs with longitudinal change in cognition. Participants (N=424; 47% male, baseline age 72.8±10.1 years) were from the Baltimore Longitudinal Study of Aging and completed 5.6±0.8 nights of wrist actigraphy at baseline. Tests of memory, executive function, attention, language, and visuospatial ability were administered at baseline and subsequent visits (3.7±1.7 years of follow-up in those with >1 visit (n=295)). In unadjusted random intercept and slope LME models, greater RAR stability predicted slower memory decline, and higher activity during participants' least active 5 hours (L5) predicted slower decline in visuospatial ability. After covariate adjustment, higher activity in participants' most active 10 hours (M10) and higher L5 predicted slower decline in visuospatial ability (p<.05). Further research is needed on RARs as risk factors for later-life cognitive decline.

### HIP ACCELEROMETRY ACTIVITY PATTERNS IMPROVE MACHINE LEARNING PREDICTION OF 1-YEAR MOCA SCORE CHANGE

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We tested whether free-living hip accelerometry measures improved prediction of 1-year change in Montreal Cognitive Assessment (MoCA) scores beyond clinically available information. We analyzed data (n=126) from predominantly African American (78.2%) older adults without moderate-severe dementia residing near our geriatrics clinic. Age (73.6 ±6.1 years), gender, education, comorbidities, income, and MoCA performance were collected at baseline; participants then wore a right hip, triaxial Actigraph accelerometer (30Hz) continuously for 7 days. A MoCA was repeated at 1 year. Six measures were calculated from the daytime (7am-5pm) data: mean/variance of hourly counts per minute, mean/variance of daily percent of time spent in the lowest activity quartile, and mean/variance of daily percent of time spent in the highest activity quartile. In a random forest model containing baseline MoCA, demographics and comorbidities, the accelerometry measures improved prediction of 1-year MoCA performance by ~17.8%. Accelerometry data may be clinically useful for predicting early cognitive decline.

### STABILITY AND VARIABILITY OF INDOOR ROOM TRANSITIONS AND MILD COGNITIVE IMPAIRMENT IN OLDER ADULTS

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Indoor room transition is an underexplored real-world activity outcome. We estimated the stability and variability of indoor room transitions and their associations with mild cognitive impairment (MCI) in older adults. Older adults living-alone (n=159, age=78.3±8.8 years, 14% MCI) from the Oregon Center for Aging & Technology (ORCATECH) and the Minority Aging Research Study (MARS) were included. Room transitions were detected using passive infrared motion sensors in bathroom, bedroom, kitchen, and living room. The hourly number of room transitions was used to calculate the interdaily stability and intradaily variability of room transitions. MCI was operationalized by the Clinical Dementia Rating equaled 0.5. Generalized estimating equations models adjusted for demographics, health, and environmental factors revealed that older adults with MCI had a lower interdaily stability of room transitions than cognitive healthy peers (z=-2.06,p=0.03). A pervasive-sensing system deployed in homes can obtrusively measure room transition activities to inform cognitive health in older adults.

## Session 4070 (Paper)

### FALL RISK

### ACCELEROMETER-MEASURED DAILY STEPS, PHYSICAL FUNCTION, AND SUBSEQUENT FALL RISK IN OLDER WOMEN: THE OPACH STUDY

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We sought to investigate the association between steps per day (steps/d) and incident fall risk while also assessing the role of physical functioning on this association. Steps/d were measured by accelerometer for 7 days in 5,545 women aged 63 to 97 years between 2012 - 2014. Falls were ascertained from daily fall calendars for 13 months. Median steps/d were 3,216. There were 5,473 falls recorded over 61,564 fall calendar months. The adjusted incidence rate ratio comparing women in the highest vs. lowest step quartiles was 0.71 (95% confidence interval, 0.54 - 0.95; P-trend across quartiles of steps/d = 0.01). After further adjustment for physical function using the Short Physical Performance Battery, the rate ratio was 0.86 (0.64-1.16; P-trend = 0.27). Mediation analysis estimated that 66.7% to 70.2% of the association of steps/d and fall risk may be mediated by physical function. In conclusion, higher steps/d were related to lower incident falls primarily through their beneficial association with physical functioning. Interventions that improve physical function, including those that involve stepping, could reduce falls in older adults.

### FINDING STATIC STABILITY LIMITS: COMPARISON OF REACTIVE BALANCE IN OLDER PEOPLE WITH AND WITHOUT A HISTORY OF FALLS

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Reactive balance is a highly relevant fall risk factor, but is rarely considered in clinical practice. Especially medio-lateral perturbations lead to a pronounced instability of the gait pattern. However, there is no consensus on a method for the assessment of individually challenging perturbation intensities to apply during walking. The aim of this study is to determine and compare the static stability-limits in older adults with and without a history of falls. Twelve older adults with (OAF; 75.6 ±3.66,9♀) and 19 older adults without a history of falls (OA; 77.5 ±4.99,12♀) were subjected to progressive-intensifying perturbations while standing on a perturbation treadmill. In addition, functional performance (Mini-BESTest), fear of falling (FES-I), and physical activity (kcal) were assessed Deflection of the treadmill-platform was randomized by timing and direction and was increased until the subject had to compensate with a step (stability-limit). The maximum deflection distance for each direction, as well as the FES-I score, mini-BESTest score, and activity level were evaluated for group differences using the t-test and Mann-Whitney-U test (α≤5%). There were no significant group differences in the mini-BESTest and between the maximum tolerated deflection distances. The OAF-subjects showed an increased FES-I score (median for OA=18.0 and OAF=22.0, p=0.032) and higher activity levels (median for OA=1974 kcal and OAF=3365 kcal, p=0.011). Despite an increased fear of falling, the older adults with a fall history showed a similar stability-limit, but higher activity levels. In future experiments these static stability limits should be tested during walking and evaluated via motion analysis.

## MEAN ARTERIAL PRESSURE AND RISK OF FALLS RESULTING IN HOSPITAL PRESENTATION IN OLDER ADULTS

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Utilising data from the ASPirin in Reducing Events in the Elderly trial participants aged 70-years, we estimated MAP and variation in MAP defined as within-individual SD of MAP from baseline and first 2 annual visits. Falls were confined to those involving presentation to a hospital. Cox proportional hazards regression was used to calculate hazard ratio (HR) and 95% confidence interval (CI) for associations with falls. Amongst 16,703 participants (1,540 falls), MAP was not associated with falls irrespective of antihypertensive medication status (all: HR 1.00, 95% CI 0.99-1.01, not on antihypertensive: HR 1.01, 95% CI 0.99, 1.02, on antihypertensive: HR 1.01, 95% CI 0.99-1.02). Amongst 14,818 participants who remained in the study up to year 2 without falls, 1 unit escalation in MAP variability increased the risk (HR 1.01, 95% CI 1.00-1.03). Compared with those in the lowest tercile of variability, those in the middle or highest tercile of variability experienced an increased risk of falling (middle: HR 1.32, 95% CI 1.06-1.65; highest: HR 1.25, 95% CI 1.01-1.55). When stratified for antihypertensive medication status, those receiving diuretics (HR 1.18, 95% CI 1.00-1.39) or beta-blockers (HR 1.37, 95% CI 1.08-1.73) were at increased risk compared to those receiving renin-angiotensin-system acting agents. All results persisted after adjustment for multiple covariates. The association of diuretics and beta-blockers with falls remained significant even after excluding those with history of heart failure. Older community-dwelling adults with high variability in MAP are at increases risk of falls, particularly amongst those receiving beta-blockers or diuretics.

## MEASUREMENT DISPARITIES IN FRAILTY AMONG KIDNEY TRANSPLANT PATIENTS: IMPACT OF DIFFERENTIAL ITEM FUNCTIONING

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Frailty is commonly measured for clinical risk stratification during transplant evaluation and is more prevalent among older, non-White kidney transplant (KT) patients. However, group differences may be partially attributable to misclassification resulting from measurement bias (differential item functioning/DIF). We examined the extent that DIF affects estimates of age, sex, and race differences in frailty (physical frailty phenotype/PFP) prevalence among 4,300 candidates and 1,396 recipients. We used Multiple Indicators Multiple Causes with dichotomous indicators to assess uniform DIF in PFP criteria attributable to age (≥65vs.18-64 years), sex, and race (Black vs.White). Among candidates (mean age=55 years), 41% were female, 46% were Black, and 19% were frail. After controlling for mean frailty level, females were more likely to endorse exhaustion (OR=1.20,p=0.003), but less likely to endorse low activity (OR=0.83,p=0.01). Younger candidates were more likely to endorse weight loss (OR=1.30,p=0.005), exhaustion (OR=1.60,p<0.001), and low activity (OR=1.80,p<0.001). Black candidates were more likely to endorse exhaustion (OR=1.25,p<0.001), but less likely to endorse weakness (OR=0.79,p<0.001). Among recipients (mean age=54 years), 40% were female, 39% were Black, and 15% were frail. Younger recipients were more likely to endorse weight loss (OR=1.55,p=0.005) and low activity (OR=1.61,p=0.02); however, no DIF was detected by sex or race. Results highlight the impact of DIF for specific PFP measures by age, sex, and race among candidates, but only by age for recipients. Further research is needed to ascertain whether candidate-and/or recipient-specific thresholds to correct for DIF could improve risk prediction and equitable access to KT for older, female, and Black candidates.

## PREDICTORS OF FALLS IN OLDER ADULTS WITH AND WITHOUT DEMENTIA

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Persons living with dementia (PLWD) have up to twice the risk for falling and three-times the risk of serious fall-related injuries as those without dementia. Falls are a leading cause of hospitalizations among PLWD, who are more likely